BULLETIN BIBLIOGRAPHIQUE

Convergence in ergodic theory and probability. — Edited by V. Bergelson, P. March, J. Rosenblatt. — Ohio State University Mathematical Research Institute publications, vol. 5. — Un vol. relié, 17,5×24,5, de XI, 445 p. — Prix: DM 198.00. — Walter de Gruyter, Berlin, 1996.

The articles in this volume cover many aspects of ergodic theory and probability theory. In ergodic theory, topics covered include convergence of averaging methods, filling schemes, multiple recurrence, entropy, operator ergodic theory, uniform distribution, and skew products. In probability theory, there are articles on laws of large numbers, large deviations, random walks, Markov processes, martingales, and central limit theorems. Many of the contributions study problems that are partly typical of probability theory, and partly of ergodic theory, using techniques developed in both fields to complete analysis.

Reinhard DIESTEL. — **Graphentheorie.** — Springer-Lehrbuch. — Un vol. broché, 16×24, de XIII, 288 p. — Prix: DM 58.00. — Springer, Berlin, 1996.

Dieses Lehrbuch versucht eine grundlegende Neubewertung: was sind heute die tragenden Grundpfeiler, was die zukunftsweisenden Strömungen der Graphentheorie, aufgefasst als Teilgebiet der reinen Mathematik? Algorithmischer ausgerichtete Darstellungen möchte es ergänzen, nicht ersetzen. Das Buch vermittelt die wichtigsten Methoden der heutigen Graphentheorie: von klassischen Techniken für Zusammenhangsfragen oder Färbungsprobleme über Dichteresultate und Zufallsgraphen bis hin zu Baumstrukturen und Minoren.

Martin BAXTER, Andrew RENNIE. — **Financial calculus: an introduction to derivative pricing.** — Un vol. relié, 16×24, de IX, 233 p. — Prix: £24.95. — Cambridge University Press, Cambridge, 1996.

Here now is the first rigorous and accessible account of the mathematics behind the pricing, construction and hedging of derivative securities. Key concepts such as martingales, change of measure, and the Heath-Jarrow-Morton model are described with mathematical precision in a style tailored for market practitioners. Starting from discrete-time hedging on binary trees, continuous-time stock models (including the Black-Scholes) are developed. Practicalities are stressed, including examples from stock, currency and interest rate markets, all accompanied by graphical illustrations with realistic data. A full glossary of probabilistic and financial terms is provided.

Finite fields and applications. — Proceedings of the third International Conference, Glasgow, July 1995. — Edited by S. Cohen and H. Niederreiter. — London Mathematical Society lecture note series, vol. 233. — Un vol. broché, 15,5×23, de XX, 401 p. — Prix: £27.95. — Cambridge University Press, Cambridge, 1996.

Finite fields are algebraic structures in which there is much research interest and they have been shown to have a wide range of applications. These proceedings give a state-of-the-art account of the area of finite fields and their applications in communications (coding theory, cryptology), combinatorics, design theory, quasirandom points, and algorithms and their complexity. Typically, theory and application are tightly interwoven in the survey articles and original research papers included here. These also demonstrate inter-connections with other branches of pure mathematics such as number theory, group theory and algebraic geometry.

Richard DEDEKIND. — **Theory of algebraic integers.** — Translated and introduced by John Stillwell. — Cambridge mathematical library. — Un vol. broché, 15,5×23, de VII, 158 p. — Prix: £14.95. — Cambridge University Press, Cambridge, 1996.

This book is a translation of Dedekind's memoir "Sur la théorie des nombres entiers algébriques". The translator, John Stillwell, also adds a detailed introduction that gives the historical background as well as outlining the mathematical obstructions that Dedekind was striving to overcome. The memoir gives a candid account of Dedekind's development of an elegant theory as well as providing blow by blow comments as he wrestled with the many difficulties encountered en-route.

Pierre MEUNIER. — **Exercices d'analyse corrigés et commentés: classes préparatoires aux grandes écoles scientifiques, premiers cycles universitaires.** — Mathématiques. — Un vol. relié, 15,5×22, de VIII, 451 p. — Prix: FF 248.00. — Presses Universitaires de France, Paris, 1996.

Ce recueil d'exercices est divisé en trois chapitres: Topologie, Calcul différentiel, Equations différentielles. Il propose environ deux cents exercices et six problèmes de révision, chacun d'eux étant placé à la fin du chapitre correspondant; la fin de l'ouvrage est constituée par un appendice concernant un problème aux limites de Sturm-Liouville. Les exercices de ce recueil sont de difficultés variées, afin que chacun puisse «y trouver son compte» et tester ses connaissances...

Richard R. HALL. — **Sets of multiples.** — Cambridge tracts in mathematics, vol. 118. — Un vol. relié, 16×23,5, de XVI, 264 p. — Prix: £37.50. — Cambridge University Press, Cambridge, 1996.

The theory of sets of multiples, a subject which lies at the intersection of analytic and probabilistic number theory, has seen much development since the publication of *Sequences* by Halberstam and Roth nearly thirty years ago. The area is rich in problems, many of them still unsolved or arising from current work. One of the fascinations of the theory is the variety of methods applicable to it, which include Fourier analysis, group theory, high and ultra-low moments, probability and elementary inequalities, as well as several branches of number theory.

E.T. WHITTAKER, G.N. WATSON. — **A course of modern analysis.** — Fourth edition, reprinted. — Cambridge mathematical library. — Un vol. broché, 15×23, de 608 p. — Prix: £29.95. — Cambridge University Press, Cambridge, 1996.

This classic text is known to and used by thousands of mathematicians and students of mathematics throughout the world. It gives an introduction to the general theory of infinite processes and of analytic functions together with an account of the principal transcendental functions.

Contact and symplectic geometry. — Edited by C.B. Thomas. — Publications of the Newton Institute, vol. 8. — Un vol. relié, 15,5×23,5, de XVIII, 310 p. — Prix: £37.50. — Cambridge University Press, Cambridge, 1996.

This volume presents some of the lectures and research during the special program held at the Newton Institute in 1994. The book, in two parts, begins with an introductory overview. The two parts each contain a mix of substantial expository articles and research papers that outline important and topical ideas. Many of the results have not been presented before. Symplectic methods are one of the most active areas of research in mathematics currently, and this volume will attract much attention.

H.S.M. COXETER, S.L. GREITZER. — **Geometry revisited.** — New mathematical library, vol. 19. — Un vol. broché, 15×23, de XIV, 193 p. — Prix: £14.95. — The Mathematical Association of America, New York, distributed by Cambridge University Press, Cambridge, UK, 1967.

The chief purpose of this book is to revisit those regions of elementary geometry that were enjoyed by our ancestors, making use of the idea of transformations: an idea that facilitates geometric understanding and links the subject with other branches of mathematics. In particular, Chapter 5 introduces the reader to inversive geometry, and Chapter 6 introduces conics with special emphasis on the notions of focus and eccentricity. The early chapters take the reader by easy stages from very simple ideas to the core of the subject. The problems throughout the book contain extensions of the text as well as challenges to the reader.

Underwood DUDLEY. — **Mathematical cranks.** — Un vol. broché, 15,5×23,5, de X, 372 p. — Prix: £17.95. — The Mathematical Association of America, Washington D.C, 1992, distributed by Cambridge University Press, Cambridge, UK.

Since cranks and their ideas come in such variety, the book is descriptive, a collection of examples designed to give readers an idea of what cranks do and how they do it. There can be no solution to the problem of mathematical cranks – obsessive people we will always have with us, and some will be obsessed with mathematics – but perhaps viewing the futility of their efforts will turn some prospective cranks to more fruitful endeavors. Kenneth O. May called the work of mathematical cranks part of folk mathematics and said that it should not pass unrecorded.

Underwood DUDLEY. — **The trisectors.** — Un vol. broché, 15,5×23,5, de XVII, 184 p. — Prix: £14.95. — The Mathematical Association of America, Washington D.C.,1994, distributed by Cambridge University Press, Cambridge, UK.

This book is about angle trisections and the people who attempt them. Its purposes are to collect many trisections in one place, inform about trisectors, amuse the reader, and perhaps most importantly, reduce the number of trisectors. This book includes detailed information about the personalities of trisectors and their constructions.

Sherman K. STEIN, Sándor SZABÓ. — **Algebra and tiling: homomorphisms in the service of geometry.** — The Carus mathematical monographs, vol. 25. — Un vol. relié, 15×21,5, de XII, 207 p. — Prix: £22.95. — The Mathematical Association of America, Washington D.C.,1996, distributed by Cambridge University Press, Cambridge UK.

Often questions about tiling space or a polygon lead to algebraic questions. For instance, tiling by cubes raises questions about finite abelian groups. The first six chapters of this book form a self-contained treatment of these topics, beginning with Minkowski's conjecture about lattice tiling of Euclidean space by unit cubes, and concluding with Laczkowicz's recent work on tiling by similar triangles. The concluding chapter presents a simplified version of Rédei's theorem on finite abelian groups.

Kees DOETS. — **Basic model theory.** — Studies in logic, language and information. — Un vol. broché, 15,5×23, de VIII, 130 p. — Prix: US$ 10.95. — CSLI Publications, Stanford, 1996, distributed by Cambridge University Press, Cambridge UK.

Model theory investigates the relationships between mathematical structures ("models") and formal languages (in which statements about these structures can be formulated). Examples of such structures are: the natural numbers with the usual arithmetical operations, the structures familiar from algebra, ordered sets, etc. The model theory of first-order languages are emphasized, as they are the best known. An example result is Löwenheim's theorem: a first-order sentence true of some uncountable structure must hold in some countable structure as well. The author also covers second-order languages and several of its fragments.

Jon BARWISE, Lawrence MOSS. — **Vicious circles: on the mathematics of non-wellfounded phenomena.** — CSLI lecture notes, vol. 60. — Un vol. broché, 15,5×23, de X, 390 p. — Prix: £16.95. — CSLI Publications, Stanford, 1996, distributed by Cambridge University Press, Cambridge UK.

Vicious circles offers an introduction to this fascinating and timely topic. Written as a book to learn from, theoretical points are always illustrated by examples from the applications and by exercises whose solutions are also presented. In addition to presenting the basic material on hypersets and their applications, this volume thoroughly develops the mathematics behind solving systems of set equations, greatest fixed points, coinduction, and corecursion. Much of this material has not appeared before. The application chapters also contain new material on modal logic and new explorations of paradoxes from semantics and game theory.

Jean-Baptiste HIRIART-URRUTY. — **L'optimisation.** — Que sais-je, vol. 3184. — Un vol. broché, 11,5×17,5, de 127 p. — Presses Universitaires de France, Paris, 1996.

«Minimiser un coût», «maximiser un profit», «optimiser un procédé», «gagner en optimisant»..., autant d'appels à un domaine encore relativement jeune des mathématiques et de leurs applications, appelé optimisation. L'opuscule que nous présentons ici propose de guider les premiers pas dans ce domaine en se concentrant sur l'aspect essentiel qu'en sont les conditions d'optimalité. Est aussi présent dans notre démarche le souci de vulgarisation de l'optimisation vers des domaines utilisateurs partiels ou intéressés: automatique, économie mathématique, analyse numérique ou statistique.

Bernadette BOUCHON-MEUNIER, Hung T. NGUYEN. — **Les incertitudes dans les systèmes intelligents.** — Que sais-je, vol. 3110. — Un vol. broché, 11,5×17,5, de 127 p. — Presses Universitaires de France, Paris, 1996.

Ce traité présente des développements mathématiques récents concernant les approches quantitatives des principaux types d'incertitude apparaissant dans la mise en oeuvre des systèmes intelligents. Le but de cet ouvrage n'est pas d'entrer dans les détails de toutes les théories sous-jacentes à l'exploitation de connaissances incertaines ou incomplètes dans des systèmes intelligents, mais plutôt de montrer les différentes approches possibles dans le cadre d'une représentation numérique ou numérico-symbolique de ces connaissances, de les placer les unes par rapport aux autres et de donner des pistes de recherche pour des études approfondies.

D.R. COX, Nanny WERMUTH. — **Multivariate dependencies: models, analysis and interpretation.** — Monographs on statistics and applied probability, vol. 67. — Un vol. relié, 14,5×22, de XII, 255 p. — Prix: £32.50. — Chapman & Hall, London, 1996, distributed by International Thomson Publishing Services Ltd.

This monograph sets out both the general concepts and the more technical statistical issues involved in a analysis and interpretation. Numerous illustrative examples are described in outline and four studies are discussed in some detail. The use of graphical representations of dependencies and independencies among the features under study is stressed, both to incorporate available knowledge at the planning stage of an analysis and to summarize aspects important for interpretation after detailed statistical analysis is complete.

Brian S. EVERITT and Geoff DER. — **A handbook of statistical analyses using SAS.** — Un vol. broché, 15,5×23,5, de VI, 158 p. — Prix: £19.99. — Chapman & Hall, London, 1996.

This handbook gives an introduction to the use of SAS, one of the major statistical software packages, for a variety of statistical analyses. Each chapter describes a particular technique applied to a particular data set taken from *A Handbook of small data sets*, also published by Chapman and Hall. The book acts as an easy introduction to using SAS for statistics, and is a stepping stone to using the more comprehensive SAS manuals.

Akio KAWAUCHI. — **A survey of knot theory.** — Un vol. relié, 17×24, de XXI, 420 p. — Prix: SFr. 98.00. — Birkhäuser Verlag, Basel, 1996.

The present volume, written by a well-known specialist, gives a complete survey of knot theory from its very beginnings to today's most recent research results. The topics include Alexander polynomials, Jones type polynomials, and Vassiliev invariants. With its appendix containing many useful tables and an extended list of references with over 3500 entries it is an indispensable book for everyone concerned with knot theory.

Analytic number theory. — Proceedings of a Conference in Honor of Heini Halberstam. — Edited by Bruce C. Berndt, Harold G. Diamond, Adolf J. Hildebrand. — Progress in mathematics, vol. 138 et 139. — 2 vol. reliés, 16×24, de XII, 885 p., pour l'ensemble des 2 vol. — Prix: SFr. 148.00 chaque vol., ou SFr. 238.00, pour l'ensemble des 2 vol. — Birkhäuser, Boston, 1996.

The conference was held in May 1995, at the University of Illinois Conference Center at Allerton Park. The two volumes contain 50 papers, which between them give a clear picture of interesting and significant current research in number theory, especially in the analytic aspects of the subject. Particularly emphasized are topics to which Professor Halberstam made fundamental contributions, including sieves, related combinatorial aspects, multiplicative number theory, additive number theory, and the Riemann zeta-function and allied zeta-functions. The volumes include papers by the following invited one-hour speakers: George Andrews, Heini Halberstam, Christopher Hooley, Ram Murty, Jean Bourgain, Roger Heath-Brown, Henryk Iwaniec, Carl Pomerance, Robert C. Vaughan.

Marco FONTANA, James A. HUCKABA, Ira J. PAPICK. — **Prüfer domains.** — Pure and applied mathematics, vol. 203. — Un vol. relié, 16×24, de IX, 328 p. — Prix: US$ 150.00. — Marcel Dekker, New York, 1996.

This book offers an exhaustive examination of many important developments in the theory of Prüfer domains that have occurred over the past 25 years. Providing an integrated presentation of both research advances and analysis techniques, *Prüfer domains* covers the solutions of the problem of finding the number of generators needed for a finitely generated ideal of a Prüfer domain... concrete representations of particular overrings determined by ideals of **R** ...various recently developed trace properties... polynomial rings over Prüfer domains... extensions and generalizations of the original theory... and more.

Abelian groups and modules. — Proceedings of the International Conference at Colorado Springs. — Edited by David M. Arnold, Kulumani M. Rangaswamy. — Lecture notes in pure and applied mathematics, vol. 182. — Un vol. broché, 18×25, de XII, 411 p. — Prix: US$ 165.00. — Marcel Dekker, New York, 1996.

Providing an overview of current research directions, the volume offers original contributions from over 33 conference participants on topics such as: finite rank Butler groups, almost completely decomposable groups, Butler groups of infinite rank, mixed groups, torsion-free abelian groups, modules over chain rings, set/model theoretical applications, category arguments and descriptive set theory applications to algebra, etc.

Klaus KRICKEBERG. — **Petit cours de statistique.** — Un vol. broché, 15,5×23,5, de VII, 149 p. — Prix: DM 29.00. — Springer, Berlin, 1996.

Ce texte s'adresse à des personnes au niveau d'un premier cycle. Au lieu d'une théorie générale, elles y trouveront une étude détaillée des modèles statistiques les plus importants pour les applications courantes. Les notions statistiques fondamentales qui forment le substrat commun de ces modèles, en seront dégagées sans peine. L'exposition privilégie les idées intuitives et les problèmes concrets avec une rigueur mathématique complète. Pour presque tous les modèles, l'accent est mis sur les procédés exacts, maintenant praticables à l'aide des moyens de calcul récents, tandis que l'approche classique traitait les méthodes asymptotiques souvent entachées d'erreurs numériques importantes.

V. BOLTYANSKI, H. MARTINI, P.S. SOLTAN. — **Excursions into combinatorial geometry.** — Universitext. — Un vol. broché, 15,5×23,5, de X, 418 p. — Prix: DM 78.00. — Springer, Berlin, 1996.

The book deals with the combinatorial geometry of convex bodies in finite-dimensional spaces. A general introduction to geometric convexity is followed by the investigation of d-convexity and H-convexity, and by various applications. Recent research is discussed, for example the three problems from the combinatorial geometry of convex bodies, the Szoekefalvi-Nagy problem, the Borsuk problem, the Hadwiger covering problem. These and related questions are then applied to a new class of convex bodies which is a natural generalization of the class of zonoids: the class of belt bodies. Each section is supplemented by a wide range of exercises.

Sheldon M. ROSS. — **Initiation aux probabilités.** — 4ᵉ édition revue et augmentée, traduit de l'américain par Christian Hofer et Frédéric Dorsaz. — Un vol. broché, 16×24, de XI, 458 p. — Prix: SFr. 70.00. — Presses polytechniques et universitaires romandes, Lausanne, 1996.

Dans ce livre d'introduction aux probabilités, l'auteur a évité d'imposer au lecteur des préalables trop importants en mathématiques. Cette édition se distingue des précédentes par l'introduction de la notion des valeurs caractéristiques d'une variable aléatoire à partir du chapitre 4 déjà. Cela entraine des changements dans les chapitres suivants, et donne lieu à toute une classe de problèmes nouveaux. Le nombre total des exercices théoriques et des problèmes s'élève à 600, avec 235 exemples résolus. L'éventail des sujets traités est très large et dépasse ce que l'on trouve dans de pareils textes d'introduction et va jusqu'à mentionner en fin d'ouvrage des sujets connexes au thème central tels que la théorie de l'information et du codage.

Jacques SESIANO. — **Un traité médiéval sur les carrés magiques: de l'arrangement harmonieux des nombres.** — Edition, traduction et commentaire d'un texte arabe anonyme décrivant divers modes de construction. — Un vol. broché, 16×24, de VI, 208 p. — Prix: SFr. 80.00. — Presses polytechniques et universitaires romandes, Lausanne, 1966.

Cet ouvrage est la reproduction, la traduction et le commentaire d'un manuscrit arabe anonyme du XIe siècle expliquant divers modes généraux de construction des carrés magiques. Il s'agit de la première étude sur le plus ancien texte conservé qui présente des méthodes générales de construction des carrés magiques. L'auteur inconnu de ce manuscrit a fait une synthèse des connaissances de son temps, les a ordonnées et présentées avec une exceptionnelle clarté. On sera dès lors moins surpris que son ouvrage ait été recopié jusqu'au XVIIIe siècle, et que l'on puisse le lire aujourd'hui avec profit.

Schrödinger operators, Markov semigroups, wavelet analysis, operator algebras. — Edited by Michael Demuth, Elmar Schrohe, Bert-Wolfgang Schulze (editor-in-chief), Johannes Sjöstrand. — Mathematical topics, vol. 11. — Un vol. relié, 17,5×24,5, de 404 p. — Prix: DM 130.00. — Akademie Verlag, Berlin, 1996.

The volume begins with a survey on the use of semiclassical analysis and maximum-principle techniques in statistical mechanics. There follows an article presenting the perturbation theory for generators of Markov semigroups acting on L^p. The third contribution provides a self-contained introduction to continuous wavelet analysis, including its relations to function spaces and microlocal regularity. The final section explores pseudo-differential analysis on singular configuration, with special emphasis on C^*-algebra techniques, Mellin operators, and analytical index formulas.

Michel WILLEM. — **Minimax theorems.** — Progress in nonlinear differential equations and their applications, vol. 24. — Un vol. relié, 16×24, de VIII, 159 p. — Prix: SFr. 78.00. — Birkhäuser, Boston, 1996.

Willem's book is devoted to minimax theorems and their applications to partial differential equations in a simple and unified way. Starting from a quantitative deformation lemma, the author gives many applications to problems dealing with lack of compactness, in particular, problems with critical exponents and existence of solitary waves. The material covers many recent tools and some unpublished results, such as a treatment of the generalized Kadomtsev-Petviashvili equations. It assumes only a basic knowledge of Sobolev spaces, partial differential equations and linear functional analysis.

Laura TOTI RIGATELLI. — **Evariste Galois, 1811-1832.** — Translated from the Italian by John Denton. — Vita mathematica, vol. 11. — Un vol. broché, 15,5×23, de 162 p. — Prix: SFr. 32.00. — Birkhäuser Verlag, Basel, 1996.

This new and scrupulously researched biography of the founder of modern algebra sheds much light on a life led with great intensity and a death met tragically under dark circumstances. Sorting speculation from documented fact, it offers the fullest and most exacting account ever written of Galois' life and work. It took more then seventy years to fully understand the French mathematician's first mémoire (published in 1846) which formulated the famous "Galois theory" concerning the solvability of algebraic equations by radicals, from which group theory would follow.

David E. EDMUNDS, Hans TRIEBEL. — **Function spaces, entropy numbers, differential operators.** — Cambridge tracts in mathematics, vol. 120. — Un vol. relié, 16×23, de XI, 252 p. — Prix: £40.00. — Cambridge University Press, Cambridge, 1996.

Recent advances have shed new light upon classical problems of the distribution of the eigenvalues of differential operators, and this book presents a fresh approach, largely based upon the results of the authors. The emphasis here is on a topic of central importance in

analysis, namely the relationship between, function spaces on Euclidean n-space and on domains, entropy numbers in quasi-Banach spaces, and the distribution of the eigenvalues of degenerate elliptic (pseudo)differential operators.

Sub-Riemannian geometry. — André Bellaïche, Jean-Jacques Risler, editors. — Progress in mathematics, vol. 144. — Un vol. relié, 16×24, de VIII, 393 p. — Prix: SFr. 88.00. — Birkhaüser Verlag, Basel, 1996.

This book provides an introduction to sub-Riemannian geometry and presents the state of the art and open problems in the field. It consists of five coherent and original articles by the leading specialists. — Contents: André Bellaïche: The tangent space in sub-Riemannian geometry. — Mikhael Gromov: Carnot-Carathéodory spaces seen from within. — Richard Montgomery: Survey of singular geodesics. — Hector J. Sussmann: A cornucopia of four-dimensional abnormal sub-Riemannian minimizers. — Jean-Michel Coron: Stabilization of controllable systems.

Roman KALUZA. — **Through a reporter's eyes: the life of Stefan Banach.** — Translated and edited by Ann Kostant, Wojbor Woyczynski. — Un vol. relié, 16×23,5, de X, 137 p. — Prix: SFr. 34.00. — Birkhäuser, Boston, 1996.

This small volume, originally written in Polish is an effort to fill that gap in the biographical literature. It is based on original archival sources, dozens of interviews with people who knew and remember Banach, and conversations with mathematicians who are familiar with Banach's work and its impact on modern mathematics. The author presents engaging descriptions of Banach's personality and the unusual milieu in which he worked. A chapter focuses on the famous Scottish café, which like Banach himself, has achieved an almost mythical dimension in mathematical lore. The English edition has been revised to include new materials and many photographs.

Andrei N. BORODIN, Paavo SALMINEN. — **Handbook of Brownian motion - facts and formulae.** — Probability and its applications. — Un vol. relié, 16×24, de XIV, 462 p. — Prix: SFr. 138.00. — Birkhäuser Verlag, Basel, 1996.

The purpose of this book is to give an easy reference to a large number of facts and formulae associated to Brownian motion. The book consists of two parts. The first one - theory part - is devoted mainly to properties of linear diffusions in general and Brownian motion in particular. Results are given mainly without proofs. The second one - formula part - is a table of distributions of functionals of Brownian motion and related processes. The collection contains more than 1500 numbered formulae.

Singular integral operators and related topics. — Joint German-Israeli Workshop, Tel Aviv, March 1-10, 1995. — Edited by A. Böttcher, I. Gohberg. — Operator theory, vol. 90. — Un vol. relié, 17×24, de VIII, 315 p. — Prix: SFr. 128.00. — Birkhäuser Verlag, Basel, 1996.

The main topics of the workshop were symbol calculus, index formulas, projection and quadrature methods for Toeplitz and singular integral operators with different symbols, algebras generated by such operators and algebras generated by idempotents. The other topics discussed were inverse scattering problems for differential operators, distribution of zeros for orthogonal functions, factorization of matrix functions and calculation of norms.

Algebraic aspects of integrable systems. — In memory of Irene Dorfman. — A.S. Fokas and I.M. Gelfand, editors. — Progress in nonlinear differential equations and their applications, vol. 26. — Un vol. relié, 16×24, de VIII, 350 p. — Prix: SFr. 138.00. Birkhäuser, Boston, 1996.

Among the topics covered are the Hamiltonian and bi-Hamiltonian nature of continuous and discrete integrable equations, the theta-function construction, the r-matrix formulation of integrable systems, pseudo-differential operators and modular forms, master symmetries and the Bochner theorem, asymptotic integrability, the integrability of the equations of associativity, invariance under Laplace-Darboux transformations, trace formulae of the Dirac and Schrödinger periodic operators and certain canonical 1-forms, billiard solutions associated with Riemann manifolds of integrable PDE's.

Alexander SHEN. — **Algorithms and programming: problems and solutions.** — Un vol. relié, 16×24, de VIII, 217 p. — Prix: SFr. 68.00. — Birkhäuser, Boston, 1996.

This book is primarily intended for a first year undergraduate course in programming. It is structured in a problem-solution format that requires the student to think through the programming process, thus developing an understanding of the underlying theory. The material covered includes such topics as combinatorics, sorting, searching, queues, grammar, parsing, etc...

Handbook of algebra, vol. 1. — Edited by M. Hazewinkel. — Un vol. relié, 17,5 x 24,5, de XIX, 915 p. — Prix: Dfl. 300.00. — North-Holland, Amsterdam, 1996.

From the preface: "Algebra, ... , consists of many different ideas, concepts and results. A reasonable estimate of the number of these different "items" would be somewhere between 50000 and 200000. Many of these have been named and many more could (and perhaps should) have a name or a convenient designation. Even the non-specialist is likely to encounter most of these, either somewhere in the literature disguised as a definition or a theorem or to hear about them and feel the need for more information. If this happens, one should be able to find at least something in this Handbook and hopefully enough to judge if it is worthwile to pursue the quest. In addition to the primary information, references to relevant articles, books or lecture notes should help the reader to complete his understanding. To make this possible, we have provided an index which is more extensive than usual and not limited to definitions, theorems and the like.". — *Contents of vol. 1:* Linear algebra. — Linear (in)dependence. — Fields, Galois theory, and algebraic number theory. — Generalizations of fields and related objects. — Category theory. — Homological algebra. Cohomology. Cohomological methods in algebra. Homotopical algebra. — Commutative rings and algebras. — Associative rings and algebras.

Elliptic and parabolic methods in geometry. — Edited by Ben Chow, Robert Gulliver, Silvio Levy, and John Sullivan. — Un vol. relié, 18,5×26, de VII, 203 p. — Prix: US$ 59.00. — A.K. Peters, Wellesley, Mass., 1996.

This volume documents the results of a workshop held at the Geometry Center (University of Minnesota, Minneapolis) and ... conveys the potential of using computers and computer graphics in studying a wide range of open questions in geometry. The topics include curves on surfaces flowing by curvature, hypersurfaces in $\mathbf{R}^n$ flowing by mean curvature, Ricci-curvature flow, flows associated with a Landau-Ginzburg energy, and surface diffusion for crystals. A great variety of elliptic problems make their appearance: soap-bubble configurations with multiple prescribed volumes, unstable minimal hypersurfaces, singularities of Yang-Mills solutions, and the Yamabe problem.

William B. EWALD. — **From Kant to Hilbert: a source book in the foundations of mathematics.** — Oxford science publications. — 2 vol. reliés, 16,5×24, de 1340 p. pour l'ensemble des vol. — Prix: £195.00. — Clarendon Press, distributed by Oxford University Press, Oxford, 1996.

The readings in this collection have been selected to present some of the main developments in the foundations of mathematics during the period from Kant to Hilbert. Several classic works are here translated into English for the first time: Bolzano's *Contributions to a better-grounded presentation of mathematics,* Dedekind's correspondence with Cantor, Cantor's *Grundlage,* Hilbert's *Axiomatic thought.* In general, an effort has been made to include documents that are either difficult to obtain or that have been unaccountably neglected. Conversely, works that are well known and widely available have been omitted. Both mathematical and philosophical writings have been included; most selections are a mixture. It is important to remember that most of the authors in this collection are mathematicians rather than philosophers. These volumes contain 89 selections; of these 56 are translations: of the translations, 36 appear here for the first time. An extensive bibliography, incorporating all references from both volumes, appears at the end of the second volume.

Donald E. KNUTH. — **Stable marriage and its relation to other combinatorial problems: an introduction to the mathematical analysis of algorithms.** — CRM proceedings and lecture notes, vol. 10. — Un vol. broché, 18×25,5, de XIII, 74 p. — Centre de Recherches Mathématiques, Université de Montréal, Montréal, Canada, edited and distributed by the American Mathematical Society, Providence, R.I., 1996.

The book uses the appealing theory of stable marriage to introduce and illustrate a variety of important concepts and techniques of computer science and mathematics: data structures, control structures, combinatorics, probability, analysis, algebra, and especially the analysis of algorithms. The presentation is elementary, and the topics are interesting to non-specialists. Exercises with answers, an annotated bibliography, and research problems are included.

Symmetries and integrability of difference equations. — Edited by Decio Levi, Luc Vinet, Pavel Winternitz. — CRM proceedings and lecture notes, vol. 9. — Un vol. broché, 17,5×25,5, de XII, 388 p. — Centre de Recherches Mathématiques, Université de Montréal, Montréal, Canada, edited and distributed by the American Mathematical Society, Providence, R.I., 1996.

Giving an up-to-date review of the current status of the field, the book treats these specific topics: Lie groups and quantum group symmetries of difference and q-difference equations, integrable and nonintegrable discretizations of continuous integrable systems, integrability of difference equations, discrete Painlevé property and singularity confinement, integrable mappings, applications in statistical mechanics and field theories, Yang-Baxter equations, q-special functions and discrete polynomials, and q-difference integrable systems.

T.W. KÖRNER. — **The pleasures of counting.** — Un vol. broché, 19×24,5, de X, 534 p. — Prix: £17.95, (relié: £50.00). — Cambridge University Press, Cambridge, 1996.

Are you learning mathematics at a pre-university or first year university level, or do you use mathematics professionally without being a professional mathematician, or do you simply value mathematics without fearing it? If you have ever wondered what it is that mathematicians do and why they do it then this may be the book for you. Using examples as diverse as the outbreak of cholera in Victorian Soho, the Battle of the Atlantic, African Eve and the design of anchors, the author shows the kind of problems that interest mathematicians and the kind of ways in which they attack them.

Roy NICOLAIDES, Noel WALKINGTON. — **MAPLE: a comprehensive introduction.** — Un vol. relié, 19×24, de XIX, 466 p. — Prix: £24.95. — Cambridge University Press, Cambridge, 1996.

The aim of this book is to provide a solid grounding in Maple, one of the best known of the high level symbolic mathematics programs. The book has twelve chapters, of which eight are completely accessible to anyone who has completed the usual calculus and linear sequences as taught in American universities. There are three chapters on Maple programming. These can be read without prior programming experience, but a knowledge of a high-level programming language will be helpful. There is also a chapter on some relevant aspects of abstract algebra. Above all, the book is designed to enable the reader to extract value from Maple without wasting time and effort in the learning process.

Numerical recipes in Fortran 90: the art of *parallel* **scientific computing.** — Vol. 2 of Fortran numerical recipes. — Second edition. — William H. Press, Saul A. Teukolsky, William T. Vetterling, Brian P. Flannery. — Foreword by Michael Metcalf. — Un vol. relié. 17×25, de XX, p. 935-1486. — Prix: £29.95. — Cambridge University Press, Cambridge, 1996.

This new edition begins with three completely new chapters that provide a detailed introduction to the Fortran 90 language and then present the basic concepts of parallel programming, all with the same clarity and good cheer for which *Numerical recipes* is famous. Routines coded with parallel language features are usually shorter, clearer, and closer to the underlying scientific ideas than their traditionally coded, do-loop laden counterparts. All 350+ routines from the second edition of *Numerical recipes* are in this volume, almost all of them completely reworked algorithmically.

J. LE POTIER. — **Lectures on vector bundles.** — Cambridge studies in advanced mathematics, vol. 54. — Un vol. relié, 16×23,5, de VIII, 251 p. — Prix: £40.00. — Cambridge University Press, Cambridge, 1996.

This work consists of two courses on the moduli spaces of vector bundles. The first part tackles the classification of vector bundles on algebraic curves. The construction of elementary properties of the moduli spaces of stable bundles are also discussed. In particular Hilbert-Grothendieck schemes of vector bundles are constructed, and Mumford's geometric invariant theory is succinctly treated. The second part centres on the structure of the moduli space of semi-stable sheaves on the projective plane. Existence conditions for sheaves of given rank and Chern class and construction ideas are sketched in the general context of projective algebraic surfaces.

Liu YANPEI. — **Embeddability in graphs.** — Mathematics and its applications, vol. 338. — Un vol relié, 17×24,5, de XVI, 398 p. — Prix: Dfl. 295.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This monograph provides a theoretical treatment of the problems related to the embeddability of graphs. Among these problems are the planarity and planar embeddings of a graph, the Gaussian crossing problem, the isomorphisms of polyhedra, surface embeddability, problems concerning graphic and cographic matroids and the knot problem from topology to combinatorics are discussed. Rectilinear embeddability, net-embeddability of a graph, some optimization problems related to planar and rectilinear embeddings of graphs, including those of finding the shortest convex embedding with a boundary condition and the shortest triangulation for given points on the plane, the bend and the area minimizations of rectilinear embeddings, and several kinds of graph decompositions are specially described for conditions efficiently solvable.

Alain COMBROUZE, Alexandre DEDE. — **Analyse-algèbre.** — Collection Major. — Un vol. broché, 17,5×24, de XV, 483 p. — Prix: FF 148.00. — Presses universitaires de France, Paris, 1996.

Ce manuel constitue le premier de deux tomes d'analyse et d'algèbre conformes aux nouveaux programmes en deux années des classes préparatoires commerciales de la voie économique. Ce premier volume couvre le programme de la première année de ces classes. Le cours se veut clair et concis, illustré d'exemples et de commentaires. De nombreux exercices, variés et gradués, sont proposés au lecteur. Ils sont entièrement corrigés, et des conseils utiles sont donnés lors de leur résolution.

Alain COMBROUZE. — **Probabilités 1: cours et exercices corrigés.** — Collection Major. — Un vol. broché, 17,5×24, de XI, 474 p. — Prix: FF 148.00. — Presses universitaires de France, Paris, 1996.

Ce manuel est le premier tome d'une série de deux. Il est destiné aux étudiants des classes préparatoires HEC voie scientifique. Le contenu est conforme aux nouveaux programmes en deux ans des classes préparatoires commerciales. Le cours introduit les notions de Probabilités de façon concise et naturelle; il est illustré par de nombreux exemples. Un résumé est systématiquement donné à la fin de chaque chapitre. Les exercices, de difficulté graduée, sont corrigés de façon détaillée. Leurs solutions fournissent des conseils utiles au lecteur.

Norman M. MARTIN, Stephen POLLARD. — **Closure spaces and logic.** — Mathematics and its applications, vol. 369. — Un vol. relié, 17×25, de XVI, 230 p. — Prix: Dfl. 190.00. — Kluwer Academic Publishers, Dordrecht, 1996.

The book examines closure spaces, an abstract mathematical theory, with special emphasis on results applicable to formal logic. The theory is developed, conceptually and methodologically, as part of topology. At the least, the book shows how techniques and results from topology can be usefully employed in the theory of deductive systems. At most, since it shows that much of logical theory can be represented within closure space theory, the abstract theory of derivability and consequence can be considered a branch of applied topology. One upshot of this appears to be that the concepts of logic need not be overtly linguistic nor do logical systems need to have the syntax they are usually assumed to have.

Levan ZHIZHIASHVILI. — **Trigonometric Fourier series and their conjugates.** — Mathematics and its applications, vol. 372. — Un vol. relié, 17×25, de XII, 300 p. — Prix: Dfl. 245.00. — Kluwer Academic Publishers, Dordrecht, 1996.

This book presents in a coherent way the results obtained in the following aspects of the theory of multiple trigonometric Fourier series: the existence and properties of the conjugates and Hilbert transforms of integrable functions of several variables; convergence of Fourier series and their conjugates, as well as their summability by Cesàro and Abel-Poisson methods; and approximating properties of Cesàro means of Fourier series and their conjugates. Special emphasis is put on new effects which arise from dealing with multiple series and which are not inherent in the one-dimensional case. Unsolved problems are formulated separately.

Codes, designs, and geometry. — Edited by Vladimir Tonchev. — Un vol. relié, 16,5×24,5, de 116 p. — Prix: Dfl. 215.00. — Kluwer Academic Publishers, Dordrecht, 1996.

This book brings together in one place important contributions and up-to-date research results in this important area. It serves as an excellent reference, providing insight into some of the most important research issues in the field.

L.N. SHEVRIN, A.J. OVSYANNIKOV. — **Semigroups and their subsemigroups lattices.** — Mathematics and its applications, vol. 379. — Un vol. relié, 17×24,5, de XI, 378 p. — Prix: Dfl. 265.00. — Kluwer Academic Publishers, Dordrecht, 1996.

The study of various interrelations between algebraic systems and their subsystem lattices is an area of modern algebra which has enjoyed much progress in the recent past. Investigations are concerned with different types of algebraic systems such as groups, rings, modules, etc. In semigroup theory, research devoted to subsemigroup lattices has developed over more than four decades, so that much diverse material has accumulated. This volume aims to present a comprehensive presentation of this material, which is divided into three parts. Part A treats semigroups with certain types of subsemigroup lattices, while Part B is concerned with properties of subsemigroup lattices. In Part C lattice isomorphisms are discussed.

Richard Noss, Celia Hoyles. — **Windows on mathematical meanings: learning cultures and computers.** — Mathematics education library, vol. 17. — Un vol. relié, 17×24,5, de XI, 275 p. — Prix: Dfl. 200.00. — Kluwer Academic Publishers, Dordrecht, 1996.

Why are mathematical ideas so hard? Is mathematics an unassailable peak, which only the few can ever hope to conquer? Or can mathematics be broadened to be accessible to the many? Noss and Hoyle have written a book which challenges some of the conventional wisdoms on the learning of mathematics. They use the computer as a window onto mathematical meaning-making, drawing together the threads of their individual and collaborative research over more than a decade. The pivot of their theory is the idea of webbing, which explains how someone struggling with a new mathematical idea can draw on supportive knowledge, and reconciles the individual's role in mathematical learning with the part played by epistemological, social and cultural forces.

Li Huishi, Freddy van Oystaeyen. — **Zariskian filtrations.** — K-Monographs in mathematics, vol. 2. — Un vol. relié, 17×24,5, de IX, 252 p. — Prix: Dfl. 195.00. — Kluwer Academic Publishers, Dordrecht, 1996.

This book is the first to present a complete theory of filtrations on associative rings, combining techniques stemming from number theory related to valuations, with facts originating in the study of rings of differential operators on varieties. It deals with the homological algebra part of the theory via an innovative use of graded ring theory applied to the Rees ring of a filtration. This leads to a completely new approach to extensions of valuations, regularity conditions on noncommutative algebras, and geometric aspects of rings of differential operators, and provides new applications related to deformations of algebras, gauge algebras and other physics-related objects.

V. Lakshmikantham, S. Sivasundaram, B. Kaymakcalan. — **Dynamic systems on measure chains.** — Mathematics and its applications, vol. 370. — Un vol. relié, 17×24,5, de X, 285 p. — Prix: Dfl. 220.00. — Kluwer Academic Publishers, Dordrecht, 1996.

This book presents the current state of development of the theory of dynamic systems on time scales from a qualitative point of view. It consists of four chapters. Chapter one develops systematically the necessary calculus of functions on time scales. In chapter two, dynamic systems on time scales are introduced, and the basic properties of solutions of such dynamic systems are proven. The theory of Lyapunov stability is discussed in chapter three in an appropriate setup. Chapter four is devoted to describing several different areas of investigations of dynamic systems on time scales which will provide an exciting prospect and impetus for further advances in this important area which is very new.

Dajun Guo, V. Lakshmikantham, Xinzhi Liu. — **Nonlinear integral equations in abstract spaces.** — Mathematics and its applications, vol. 373. — Un vol. relié, 17×24,5, de VIII, 341 p. — Prix: Dfl. 260.00. — Kluwer Academic Publishers, Dordrecht, 1996.

The book is devoted to a comprehensive treatment of nonlinear integral equations in abstract spaces. It is the first book dedicated to a systematic presentation of the subject and includes recent developments. — *Contents:* Preface. Preliminaries. Nonlinear integral equations in Banach spaces. Nonlinear integro-differential equations in Banach spaces. Nonlinear impulsive integral equations in Banach spaces. References.

R.G. BUSCHMAN. — **Integral transformations, operational calculus, and generalized functions.** — Mathematics and its applications, vol. 377. — Un vol. relié, 17×24,5, de XII, 231 p. — Prix: Dfl. 180.00. — Kluwer Academic Publishers, Dordrecht, 1996.

Various related ideas are explored in this introductory survey, but no topic is treated thoroughly, since monographs are available on each topic separately. The Laplace transformation serves as a model for the developments of the operational properties of several other transformations. Further, it provides a connection to the Mikusinski calculus and generalized functions. The development of the Fourier transformation is followed by a different treatment of generalized functions (distributions). These introductions to generalized functions parallel the constructive approaches to the rational and real number systems.

Heinz W. ENGLE, Martin HANKE, Andreas NEUBAUER. — **Regularization of inverse problems.** — Mathematics and its applications, vol. 375. — Un vol. relié, 16×25, de VIII, 321 p. — Prix: Dfl. 245.00. — Kluwer Academic Publishers, Dordrecht, 1996.

The book is devoted to the mathematical theory of regularization methods and is intended to give an up-to-date account of the currently available results about regularization methods both for linear and for nonlinear ill-posed problems. Both continuous and iterative regularization methods are considered in detail with special emphasis on the development of parameter choice and stopping rules which lead to optimal convergence rates.

A.A. RANICKI, A.J. CASSON, D.P. SULLIVAN, M.A. ARMSTRONG, C.P. ROURKE, G.E. COOKE. — **The Hauptvermutung book: a collection of papers on the topology of manifolds.** — K-Monographs in mathematics, vol. 1. — Un vol. relié, 17×25, de VI, 190 p. — Prix: Dfl. 165.00. — Kluwer Academic Publishers, Dordrecht, 1996.

The Hauptvermutung is the conjecture that any two triangulations of a polyhedron are combinatorially equivalent. This conjecture was formulated at the turn of the century, and until its resolution was a central problem of topology. Up to now, the published record of the manifold Hauptvermutung has been incomplete. This volume brings together the original papers of Casson and Sullivan (1967), and the "Princeton Notes on the Hauptvermutung" of Armstrong, Rourke and Cooke (1968/1972). They include several results which have become part of mathematical folklore, but of which proofs had never been published. The material is complemented by an introduction on the Hauptvermutung and an account of recent developments in the area.

XVIth Rolf Nevanlinna Colloquium. — Proceedings of the International Conference held in Joensuu, Finland, August 1-5, 1995. — Edited by Ilpo Laine, Olli Martio. — Un vol. relié, 18×25, de IX, 353 p. — Prix: DM 268.00. — Walter de Gruyter, Berlin, 1996.

These proceedings contain most of the plenary lectures and a selection of invited lectures delivered at the Colloquium. The topics covered include geometric function theory, Nevanlinna theory and complex differential equations, potential theory and partial differential equations, Teichmüller spaces and mathematical physics. These areas reflect a substantial part of the mathematical activity of Rolf Nevanlinna, one of the greatest authorities on function theory in the twentieth century.

Approximation theory and function series: dedicated to Károly Tandori on his 70th birthday. — Edited by P. Vértesi, L. Leindler, F. Móricz, Sz. Révész, J. Szabados, V. Totik. — Bolyai society mathematical studies, vol. 5. — Un vol. relié, 18×24,5, de 367 p. — János Bolyai Mathematical Society, Budapest, 1996.

The International Conference on Approximation Theory and Function Series dedicated to Károly Tandori on his 70th birthday was held in Budapest during August 21-25, 1995. The main topics covered are function series, Fourier analysis, interpolation, approximation in abstract spaces and inequalities.

Karl E. GUSTAFSON, Duggirala K.M. RAO. — **Numerical range: the field of values of linear operators and matrices.** — Universitext. — Un vol. broché, 15,5×23,5, de XIV, 189 p. — Prix: DM 56.00. — Springer, Berlin, 1997.

The theories of quadratic forms and their applications appear in many parts of mathematics and the sciences. This subject and its extensions to infinite dimensions comprise the theory of the numerical range $W(T)$. This book is dedicated to presenting the fundamentals of the subject. In order to make the book quickly informative, the authors place and keep the subject in a complex Hilbert space. This setting is the heart of the numerical range theory for bounded linear operators T and naturally contains the field of values for finite dimensional matrices T.

Helmut VÖLKLEIN. — **Groups as Galois groups: an introduction.** — Cambridge studies in advanced mathematics, vol. 53. — Un vol. relié, 16×23,5, de XVII, 248 p. — Prix: £35.00. — Cambridge University Press, Cambridge, 1996.

The goal of this book is to lead the reader to an understanding of recent results on the inverse Galois problem. Assuming only elementary algebra and complex analysis, the author develops the necessary background from topology (covering space theory), Riemann surface theory, and number theory. The first part of the book is quite elementary, and leads up to the basic rigidity criteria for the realization of groups as Galois groups. The second part presents more advanced topics, such as braid group action and moduli spaces for covers of the Riemann sphere, GAR- and GAL-realizations, weak rigidity, and patching over complete valued fields. Classical results such as Riemann's existence theorem and Hilbert's irreducibility theorem are proved in full and applied in context.

Victor GUILLEMIN, Eugene LERMAN, and Shlomo STERNBERG. — **Symplectic fibrations and multiplicity diagrams.** — Un vol. relié, 16×24, de XIV, 222 p. — Prix: £29.95. — Cambridge University Press, Cambridge, 1996.

The subject of this book is the multiplicity diagrams associated with $U(n)$, $O(n)$, and the other classical groups. It presents such topics as asymptotic distributions of multiplicities, hierarchical patterns in multiplicity diagrams, lacunae, and the multiplicity diagrams of the rank-2 and rank-3 groups. The authors take a novel approach, using the techniques of symplectic geometry. They develop in detail some themes that were touched on in *Symplectic Techniques in Physics* (V. Guillemin and S,. Sternberg, Cambridge University Press, 1994).

H. GROEMER. — **Geometric applications of Fourier series and spherical harmonics.** — Encyclopedia of mathematics and its applications, vol. 61. — Un vol. relié, 16,5×24,5, de XI, 329 p. — Prix: £40.00. — Cambridge University Press, Cambridge, 1996.

This book provides a comprehensive presentation of geometric results, primarily from the theory of convex sets, that have been proved by the use of Fourier series or spherical harmonics. Almost all these geometric results appear here in book form for the first time. An

important feature of the book is that all the necessary tools from classical theory of spherical harmonics are developed as concretely as possible, with full proofs. These tools are used to prove geometric inequalities, stability results, uniqueness results for projections and intersections by hyperplanes or half-spaces, and characterizations of rotors in convex polytopes. Again, full proofs are given. To make the treatment as self-contained as possible the book begins with background material in analysis and the geometry of convex sets.

K. ERIKSSON, D. ESTEP, P. HANSBO, C. JOHNSON. — **Computational differential equations.** — Un vol. broché, 15,5×22,5, de XVI, 538 p. — Prix: £27.95. — Cambridge University Press, Cambridge, 1996.

The book begins with a constructive proof of the fundamental theorem of calculus that illustrates the close connection between integration and numerical quadrature and introduces basic issues in the numerical solution of differential equations including piecewise polynomial approximation and adaptive error control. After preparatory material on linear algebra and polynomial approximation, the computational methodology is developed starting with model problems taking the form of scalar linear ordinary differential equations, then proceeding through systems of linear ordinary differential equations to linear partial differential equations including the Poisson equation, the heat equation, the wave equation and convection-diffusion-absorption equations.

A.M. STUART, A.R. HUMPHRIES. — **Dynamical systems and numerical analysis.** — Cambridge monographs on applied and computational mathematics, vol. 2. — Un vol. relié, 16,5×23,5, de XXII, 685 p. — Prix: £40.00. — Cambridge University Press, Cambridge, 1996.

The first three chapters of this book contain the elements of the theory of dynamical systems and the numerical solution of initial-value problems. In the remaining chapters, numerical methods are formulated as dynamical systems, and the convergence and stability properties of the methods are examined. Topics studied include the stability of numerical methods for contractive, dissipative, gradient, and Hamiltonian systems together with the convergence properties of equilibria, phase portraits, periodic solutions, and strange attractors under numerical approximation.

Rudolf LIDL and Harald NIEDERREITER. — **Finite fields.** — 2nd ed. — Foreword by P.M. Cohn. — Encyclopedia of mathematics and its applications, vol. 20. — Un vol. relié, 17×24, de XIV, 755 p. — Prix: £60.00. — Cambridge University Press, Cambridge, 1996.

The theory of finite fields is a branch of algebra that has come to the fore because of its diverse applications in such areas as combinatorics, coding theory and the mathematical study of switching circuits. This book is devoted entirely to the theory of finite fields, and it provides comprehensive coverage of the literature. Biographical notes at the end of each chapter give an historical survey of the development of the subject. Worked out examples and lists of exercises found throughout the book make it useful as a text for advanced level courses.

Vyacheslav L. GIRKO. — **Theory of linear algebraic equations with random coefficients.** — Un vol. relié, 17,5×25, de XXIV, 320 p. — Prix: US$ 150.00. — Allerton Press, New York, 1996.

This book presents in a systematic and self-contained way the theory of systems of linear algebraic equations with random coefficients (SLAERC). Such a book has long been awaited because of the fundamental and ever-increasing relevance of this theory in various disciplines from mathematics to economics (optimization theory), physics (random media), systems theory and operation research, statistics, engineering (control and filter theory), stochastic programming, etc.

Carl WUNSCH. — **The ocean circulation inverse problem.** — Un vol. relié, 19×26, de XIV, 442 p. — Prix: £35.00. — Cambridge University Press, Cambridge, 1996.

The movement of oceanic water has important consequences for a variety of applications, such as climate change, sea level change, biological productivity, weather forecasting, and many others. This book addresses the problem of inferring the state of the ocean circulation, understanding it dynamically, and even forecasting it through a quantitative combination of theory and observation. It focuses on so-called inverse methods and related methods of statistical inference. Both time-independent and time-dependent problems are considered, including Gauss-Markov estimation, sequential estimators, and adjoint/Pontryagin principle methods.

Cheryl E. PRAEGER, Leonard H. SOICHER. — **Low rank representations and graphs for sporadic groups.** — Australian Mathematical Society lecture series, vol. 8. — Un vol. broché, 15×23, de XI, 141 p. — Prix: £24.95. — Cambridge University Press, Cambridge, 1996.

This book presents a complete classification of the transitive permutation representations of rank at most 5 of the sporadic simple groups and their automorphism groups, together with a comprehensive study of the vertex-transitive graphs associated with these representations. Included is a list of all vertex-transitive, distance-regular graphs on which a sporadic almost simple group acts with rank at most 5. In this list are some new, interesting distance-regular graphs of diameter 2, which are not distance-transitive. Practical computational techniques appropriate for analysing finite vertex-transitive graphs are described carefully.

Howard BECKER, Alexander S. KECHRIS. — **The descriptive set theory of Polish group actions.** — London Mathematical Society lecture note series, vol. 232. — Un vol. broché, 15,5×23, de XI, 136 p. — Prix: £21.95. — Cambridge University Press, Cambridge, 1996.

In this book the authors present their research in the foundations of the theory of definable actions of Polish groups and the associated orbit equivalence relations. Some of the topics covered here are: topological realizations of Borel measurable actions; universal actions; applications to invariant measures; actions of the infinite symmetric group in connection with model theory (logic actions); dichotomies for orbit spaces (including Silver, Glimm-Effros type dichotomies and the topological Vaught conjecture); descriptive complexity of orbit equivalence relations; definable cardinality of orbit spaces.

J.A. SETHIAN. — **Level set methods: evolving interfaces in geometry, fluid mechanics, computer vision, and materials science.** — Cambridge monographs on applied and computational mathematics, vol. 3. — Un vol. relié, 16×23,5, de XVIII, 218 p. — Prix: £27.95. — Cambridge University Press, Cambridge, 1996.

The book begins with an introduction to the dynamics of moving curves and surfaces. Next, efficient computational techniques for approximating viscosity solutions to partial differential equations are developed, using the numerical technology from hyperbolic conservation laws. This builds the framework for both general level set methods for arbitrary moving fronts, and fast marching techniques for solving special cases arising from stationary Hamilton-Jacobi equations. A large collection of applications are given, including examples from physics, chemistry, fluid mechanics, combustion, image processing, materials science, fabrication of microelectronic components, computer vision, and control theory.

E.B. DAVIES. — **Spectral theory and differential operators.** — Cambridge studies in advanced mathematics, vol. 42. — Un vol. broché, 15,5×23, de IX, 182 p. — Prix: £16.95. — Cambridge University Press, Cambridge, 1996.

This book is an introduction to the theory of partial differential operators. It describes the theory of Fourier transforms and distributions as far as is needed to analyse the spectrum of any constant coefficient partial differential operator. A completely new proof of the spectral theorem for unbounded self-adjoint operators is followed by its application to a variety of second order elliptic differential operators, from those with discrete spectra to Schrödinger operators acting on $L^2(\mathbf{R}^N)$. The book contains a detailed account of the application of variational methods to estimate the eigenvalues of operators with measurable coefficients defined by the use of quadratic form techniques.

R.P. BURN. — **A pathway into number theory.** — Second edition. — Un vol. broché, $15,5 \times 23$, de xv, 262 p. — Prix: £15.95. — Cambridge University Press, Cambridge, 1996.

Number theory is concerned with the properties of the natural numbers: 1, 2, 3, ... During the seventeenth and eighteenth centuries, number theory became established through the work of Fermat, Euler and Gauss. With the hand calculators and computers of today the results of extensive numerical work are instantly available and the road leading to their discoveries may be traversed with comparative ease. Now in its second edition, this book consists of a sequence of exercises that will lead readers from quite simple number work to the point where they can prove algebraically the classical results of elementary number theory for themselves.

Alain COMBROUZE, Tran VAN HIEP. — **Mathématiques: analyse et programmation. Cours et exercices corrigés, 1.** — Collection Major. — Un vol. broché, $17,5 \times 24$, de xii, 333 p. — Prix: FF 168.00. — Presses universitaires de France, Paris, 1996.

Ce manuel, spécialement destiné aux étudiants des classes préparatoires HEC, voie scientifique, s'adresse également aux étudiants de Math-Sup Biologie et de DEUG. Il constitue le premier de deux tomes d'analyse conformes aux nouveaux programmes en deux années des classes préparatoires HEC. Le cours se veut clair et concis, illustré d'exemples et de commentaires. De nombreux exercices, variés et gradués, sont proposés au lecteur. Ils sont entièrement corrigés, et des conseils utiles sont donnés lors de leur résolution.

Alexander I. SAICHEV, Wojbor A. WOYCZYNSKI. — **Distribution in the physical and engineering sciences. Vol. 1: Distributional and fractal calculus, integral transforms and wavelets.** — Applied and numerical harmonic analysis. — Un vol. relié, 24×16, de xviii, 336 p. — Prix: Sfr. 68.00. — Birkhäuser, Boston, 1997.

Features: Application-oriented exposition of distributional calculus including solutions of ordinary differential equations. — Detailed coverage of asymptotic methods, including the stationary phase and steepest descent methods, for Fourier and other integral transforms from an applications perspective. — Modern topics such as fractional calculus, uncertainty principle, wavelets, and multiresolution analysis. — Extensive use of real word applications from fluid mechanics, wave propagation, optics, relaxation phenomena, etc. Solution and/or answers to exercises are carefully worked out at the end of the book.

Philip J. DAVIS. — **Mathematical encounters of the second kind.** — Un vol. relié, 16×23, de viii, 304 p. — Prix: Sfr. 40.00. — Birkhäuser, Boston, 1997.

The book is a joyful memoir of the author's encounters, some actual and some fictional, with a number of mathematicians and historical figures. Davis' message is that an interest in mathematics can, like an activity of the human mind, bring people into contact with each other over centuries, over oceans, and over cultural separations. He came to realize that mathematics goes beyond the scientific and technological needs of society, and can serve as a social connection among people of diverse origins, abilities, and stations in life.

Gian-Carlo ROTA. — **Indiscrete thoughts.** — Edited by Fabrizio Palombi. — Un vol. relié, 16×23, de XXII, 280 p. — Prix: Sfr. 58.00. — Birkhäuser, Boston, 1997.

This work gives a rare glimpse into a world that has seldom been described, that of science and technology as seen through the eyes of a mathematician. The era covered by this book, 1950 to 1990, was one of the golden ages of science as well as the American university. Cherished myths are debunked along the way as Gian-Carlo Rota takes pleasure in portraying, warts and all, some of the great scientific personalities of the period — Stanislav Ulam, Solomon Lefschetz, William Feller, Jack Schwartz, and many others. The author is not afraid of controversy... The book should become the subject of debate for decades to come.

Augusto VISINTIN. — **Models of phase transitions.** — Progress in nonlinear differential equations and their applications, vol. 28. — Un vol. relié, 16×24, de VII, 322 p. — Prix: Sfr. 118.00. — Birkhäuser, Boston, 1997.

This book deals with the analysis of models of solid-liquid systems. Its main purpose is to offer an introduction to the classical Stefan problem and to some of its physically motivated extensions. Macroscopic, mesoscopic and two-scale models for Stefan-type problems lead to the formulation of initial- and boundary-value problems for nonlinear PDE's. Their analysis is developed in the framework of Sobolev spaces. Nucleation and surface tension phenomena are also discussed and new results presented.

Problems and solutions from The Mathematical Visitor 1877-1896. — Edited by Stanley Rabinowitz. — Classic problem collection, vol. 1. — Un vol. broché, 22×28, de XI, 258 p. — MathProPress, Westford, Massachusetts, 1996.

The Mathematical Visitor is a little known American journal that was published from 1877 to 1896. It presents a very tasteful collection of creative and challenging mathematical problems with their solutions. For the convenience of the modern reader, the wording is updated to conform to modern terminology. Solutions are presented exactly as they appeared in the journal, without any further editing. The book contains all 344 problems that were originally published in the 19th century journal, classified by subject.

Games of no chance. — Combinatorial games at MSRI, 1994. — Edited by Richard J. Nowakowski. — Mathematical Sciences Research Institute publications, vol. 29. — Un vol. relié, 16,5×24, de XII, 537 p. — Prix: £40.00. — Cambridge University Press, Cambridge, 1996.

This volume, arising from the workshop held at MRSI in July 1994 includes expository articles by some of the masters in the field; studies of the classical games of chess and go 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 updated and commented list of unsolved problems by R.K. Guy and a bibliography by A. Fraenkel.

Moshé MACHOVER. — **Set theory, logic and their limitations.** — Un vol. broché, 15×23, de IX, 288 p. — Prix: £40.00. — Cambridge University Presss. Cambridge, 1996.

This is an introduction to set theory and logic that starts completely from scratch. The text is accompanied by many methodological remarks and explanations. A rigorous axiomatic presentation of Zermelo-Fraenkel set theory is given, demonstrating how the basic concepts of mathematics have apparently been reduced to set theory. This is followed by a presentation of

propositional and first-order logic. Concepts and results of recursion theory are explained in intuitive terms, and the author proves and explains the limitative results of Skolem, Tarski, Church, and Gödel (the celebrated incompleteness theorems).

Kreiseliana: about and around George Kreisel. — Edited by Piergiorgio Odifreddi. — Un vol. relié, 16×23,5, de XIII, 495 p. — Prix: US$60.00. — A.K. Peters, Wellesley, MA, 1996.

This multifaceted collection of essays, reminiscences, and professional papers combine to create an exceptional tribute to the unusual, enigmatic, and ultimately fascinating personality of George Kreisel. An eminently influential logician and mathematical philosopher, Kreisel is revealed as much more in this entertaining juxtaposition of viewpoints from famous contributors like Verena Huber-Dyson, Sol Feferman, and Francis Crick.

V.I. LEBEDEV. — **An introduction to functional analysis and computational mathematics.** — Un vol. relié, 16×24, de 255 p. — Prix: Sfr. 98.00. — Birkhäuser, Boston, 1997.

The book presents basics of functional analysis, as well as elements of variational equations (on the basis of bilinear forms). Sobolev spaces and embedding theorems are introduced. One chapter is completely devoted to iteration methods of solving operator equations. Also considered is optimization of iteration methods of solving incomplete problems on eigenvalues and explicit methods of solving stiff systems of differential equations using extremal properties of Chebyshev polynomials.

Valentin P. DYMNIKOV, Aleksander M. FILATOV. — **Mathematics of climate modeling.** — Modeling and simulation in science, engineering, and technology. — Un vol. relié, 16×24, de XVI, 264 p. — Prix: SFr. 98.00. — Birkhäuser, Boston, 1997.

This book gives an introduction to a new branch of climate theory: the study of climate models by means of quality theory of partial differential equations. The first part is devoted to the state of the art theory of infinite-dimensional and finite-dimensional nonlinear dissipative systems. The second part of the book contains the results of analysis of climate models of different complexity from barotropic models to models based on the full system of hydro-thermodynamics equations.

Gérard LAUMON. — **Cohomology of Drinfeld modular varieties: part II, Automorphic forms, trace formulas and Langlands correspondence.** — Cambridge studies in advanced mathematics, vol. 56. — Un vol. relié, 16×23,5, de XI, 366 p. — Prix: £40.00. — Cambridge University Press, Cambridge, 1997.

This book aims to provide an introduction, in two volumes, both to this subject and to the Langlands correspondence for function fields. This second volume is concerned with the Arthur-Selberg trace formula, and to the proof in some cases of the Ramanujan-Petersson conjecture and the global Langlands conjecture for function fields. It is based on graduate courses taught by the author, who uses techniques which are extensions of those used to study Shimura varieties. Though the author considers only the simpler case of function rather than the number fields, many important features of the number field case can be illustrated.

Dragoš CVETKOVIĆ, Peter ROWLINSON, Slobodan SIMIĆ. — **Eigenspaces of graphs.** — Encyclopedia of mathematics and its applications, vol. 66. — Un vol. relié, 16,5×24, de XIII, 258 p. — Prix: £45.00. — Cambridge University Press, Cambridge, 1997.

This book describes how the spectral theory of finite graphs can be strengthened by exploiting properties of the eigenspaces of adjacency matrices associated with a graph. The

extension of spectral techniques proceeds at three levels: using eigenvectors associated with an arbitrary labelling of graph vertices, using geometrical invariants of eigenspaces such as graph angles and main angles, and introducing certain kinds of canonical eigenvectors by means of star partitions and star bases. Current research on these topics may be seen as part of a wider effort to forge closer links between algebra and combinatorics. One objective is to describe graphs by algebraic means as far as possible, and the book discusses the Ulam reconstruction conjecture and the graph isomorphism problem in this context.

P.D.T.A. ELLIOTT. — **Duality in analytic number theory.** — Cambridge tracts in mathematics, vol. 122. — Un vol. relié, 15,5×23,5, de XVIII, 341 p. — Prix: £40.00. — Cambridge University Presss. Cambridge, 1997.

The book illustrates a way of thinking mathematically: historical background is woven into the narrative, variant proofs illustrate obstructions, false steps and the development of insight, in a manner reminiscent of Euler. It is shown how to formulate theorems as well as how to construct their proofs. Elementary notions from functional analysis, Fourier analysis, functional equations and stability in mechanics are controlled by a geometric view and synthesized to provide an arithmetic analogue of classical harmonic analysis that is powerful enough to establish arithmetic propositions until now beyond reach.

Steven ROMAN. — **Introduction to coding and information theory.** — Undergraduate texts in mathematics. — Un vol. relié, 18,5×24, de XIII, 323 p. — Prix: DM 58.00. — Springer, New York 1997.

This book is an introduction to coding and information theory, with an emphasis on coding theory. After a preliminary chapter on elementary discrete probability, there follows an introductory chapter on variable-length codes that culminates in Kraft's theorem. Two chapters on information theory follow - the first on Huffman encoding and the second on the concept of the entropy of an information source, culminating in a discussion of Shannon's noiseless coding theorem. The remaining four chapters cover the theory of error-correcting block codes.

B.A. SETHURAMAN. — **Rings, fields, and vector spaces: an introduction to abstract algebra via geometric constructibility.** — Undergraduate texts in mathematics. — Un vol. relié, 16×24, de XII, 190 p. — Prix: DM 56.00. — Springer, New York, 1997.

Using the proof of the nontrisectibility of an arbitrary angle as final goal, the author develops, in an easy conversational style, the basics of rings, fields, and vector spaces. The book begins with an essay on how to learn mathematics, and leads up to constructibility by studying divisibility in the integers, rings and fields, vector spaces, field extensions, polynomials with coefficients in a field, and fields generated over a subfield by a single element. Along the way, the author develops several topics of potential interest to future high-school teachers - including solutions of polynomial equations, constructibility of n-gons, and algebraic and transcendental numbers.

Paul KOOSIS.— **Leçons sur le théorème de Beurling et Malliavin.** — Un vol. broché, 18×25,5 de XII, 230 p. — Les Publications CRM, Montréal, 1996.

Le théorème de Levinson: Fonctions entières en type exponentiel; généralités. Théorème de Levinson. — *La classe de Cartwright:* Vérification des propriétés. Une variante de la formule de Jensen. Les zéros réels d'une fonction de type exponentiel bornée sur **R**. Un lemme fondamental de Beurling et Malliavin. Retour aux fonctions de la classe de Cartwright. — *Emploi des fonctions sous et surharmonique:* Méthode de Hörmander. La plus petite majorante

surharmonique. Le plus petit théorème du multiplicateur. — *Discussion du théorème de Beurling et Malliavin:* Deux versions du théorème. Une application. La 1re version entraîne la seconde. La seconde version entraîne la 1re. — *Théorème de Beurling et Malliavin: démonstration:* Réduction à l'existence d'une majorante surharmonique. Construction de deux majorantes sur **R**. Construction dans la bande curviligne. Notre majorante surharmonique. Remarques.

Lectures in real geometry. — Edited by Fabrizio Broglia. — De Gruyter expositions in mathematics, vol. 23. — Un vol. relié, 24,5×17, de XIV, 268 p. — Prix: DM 198.00. — Walter de Gruyter, Berlin, 1996.

This book reflects in a sense the state of the art in each exposed topic and it is a useful reference for anyone wishing to have an overview of the current work in some of the more important areas of real geometry. — *Contents:* **Marie Françoise Roy:** Basic algorithms in real algebraic geometry and their complexity: from Sturm's theorem to the existential theory of reals. — **Masahiro Shiota:** Nash functions and manifolds. — **Alberto Tognoli:** Approximation theorems in real analytic and algebraic geometry. — **Ciro Ciliberto and Claudio Pedrini:** Real abelian varieties and real algebraic curves. — **Alberto Tognoli:** Mario Raimondo's contributions to real geometry. — **Tomas Recio and Maria-Emilia Alonso:** Mario Raimondo's contributions to computer algebra.

Nonlinear partial differential equations in geometry and physics: the 1995 Barrett Lectures. — Edited by Garth Baker, Alexandre Freire. — Progress in nonlinear differential equations and their applications, vol. 29. — Un vol. relié, 16,5×24, de XI, 153 p. — Prix: SFr. 58.00. — Birkhäuser Verlag, Basel, 1997.

This volume contains survey lectures in four different areas, delivered by leading researchers at the 1995 Barrett Lectures held at the University of Tennessee: nonlinear hyperbolic systems arising in field theory and relativity (S. Klainerman); harmonic maps from Minkowski space-time (M. Struwe); dynamics of vortices in the Ginzburg-Landau model of superconductivity (F.-H. Lin); the Seiberg-Witten equations and their application to problems in four-dimensional topology (R. Fintushel).

Systems and control in the twenty-first century. — Edited by Christopher I. Byrnes, Biswa N. Datta, Clyde F. Martin, David S. Gilliam. — Progress in systems and control theory, vol. 22. — Un vol. relié, 16,5×24,5, de X, 434 p. — Prix: SFr. 148.00. — Birkhäuser, Boston, 1997.

This volume contains articles by leading researchers who are on the vanguard of the development of systems, control and estimation for the next century. These articles were presented at the 12th International Symposium on the Mathematical Theory of Networks and Systems held in St. Louis, Missouri from June 24-28, 1996. The book includes new methodologies in distributed parameter systems, linear, nonlinear, and stochastic systems, and pure mathematics for solving problems in areas such as aircraft design, circuit simulation, imaging, speech synthesis, and visionics. It is also notable for its use of models and methods drawn from biology, computing and materials science and should prove to be a valuable reference to graduate students and researchers in areas of engineering and mathematics who have an interest in the analysis, design, and synthesis of circuits and systems.

Ram P. KANWAL. — **Linear integral equations: theory and technique.** — Second edition. — Un vol. relié, 16,5×24,5, de VIII, 318 p. — Prix: SFr. 124.00. — Birkhäuser, Boston, 1997.

Many physical problems that are usually solved by differential equation methods can be solved more effectively by integral equation methods. Such problems abound in applied

mathematics, theoretical mechanics, and mathematical physics. The second edition of this book continues the emphasis on applications and presents a variety of techniques with extensive examples. Additional material has been added throughout, and chapters dealing with differential equations and singular integral equations have been expanded considerably.

William E. BOYCE, Richard C. DIPRIMA. — **Elementary differential equations and boundary value problems.** — Sixth edition. — Un vol. relié, 20×24,5, de XVI, 749 p. — Prix: £21.95. — John Wiley, New York, 1997.

This edition, like its predecessors, is written from the viewpoint of the applied mathematician. The authors have sought to combine a sound and accurate exposition of the elementary theory of differential equations with considerable material on methods of solution, analysis, and approximation that have proved useful in a wide variety of applications. The book is written for undergraduate students of mathematics, science, or engineering, who typically take a course on differential equations during their first or second year of study.

Steven ROSENBERG. — **The Laplacian on a Riemannian manifold: an introduction to analysis on manifolds.** — London mathematical society student texts, vol. 31. — Un vol. broché, 15,5×23, de X, 172 p. — Prix: £12.95. — Cambridge University Press, Cambridge, 1997.

The main theme of the book is the study of heat flow associated to the Laplacians on differential forms. This provides a unified treatment of Hodge theory and the supersymmetric proof of the Chern-Gauss-Bonnet theorem. In particular, there is a careful treatment of the heat kernel for the Laplacian on functions. The Atiyah-Singer index theorem and its applications are developed (without complete proofs) via the heat equation method. Zeta functions for Laplacians and analytic torsion are also treated, and the recently uncovered relation between index theory and analytic torsion is laid out.

Group theory, algebra, and number theory. — Colloquium in memory of Hans Zassenhaus held in Saarbrücken, Germany, June 4-5, 1993. — Edited by Horst G. Zimmer. — Un vol. relié, 17,5×24,5, de XV, 201 p. — Prix: DM 228.00. — Walter de Gruyter, Berlin, 1996.

This book contains six papers by distinguished experts arising from or related to the mathematical work of Hans Zassenhaus (1912-1991). Topics treated include group theory, Lie algebras, commutative group rings and computational number theory. **Contents:** *H.G. Zimmer:* Introductory address — *H. Tietz:* After-dinner speech — *P.-H. Tiep:* On the solvability of the kernel of any orthogonal decomposition — *A.I. Kostrikin:* The beginnings of modular Lie algebra theory — *M.E. Pohst:* Computing invariants of algebraic number fields — *W. Plesken:* Kristallographische Gruppen — *H. Bender:* Endliche Fastkörper und Zassenhausgruppen — *K. Hoechsmann:* On the arithmetic of commutative group rings.

Functional analysis. — Proceedings of the first International Workshop held at Trier University Germany, September 26-October 1, 1994. — Edited by Susanne Dierolf, Seán Dineen, Paweł Domański. — Un vol. relié, 17,5×24,5, de X, 473 p. — Prix: DM 268.00. — Walter de Gruyter, Berlin, 1996.

The volume contains 37 original refereed research articles from various branches of functional analysis, with an emphasis on Fréchet spaces and Banach space theory. Applications of functional analytic tools to problems of classical analysis, in particular to questions related to partial differential operators, are also considered.

Thomas RUNST, Wilfried SICKEL. — **Sobolev spaces of fractional order, Nemytskij operators, and nonlinear partial differential equations.** — De Gruyter series in nonlinear analysis and applications, vol. 3. — Un vol. relié, 18×25, de x, 547 p. — Prix : DM 268.00. — Walter de Gruyter, Berlin, 1996.

The subject of this book is the theory of nonlinear boundary value problems in function spaces. It focuses on the analysis of semilinear elliptic boundary value problems in Sobolev spaces of fractional order. Here methods from Fourier analysis and the theory of function spaces are used to study existence and multiplicity results in the general framework of Besov-Triebel-Lizorkin spaces. Topics covered are: function spaces of Besov-Triebel-Lizorkin type; regular elliptic boundary value problems; pointwise multiplication; Nemytskij operators in spaces of Besov-Triebel-Lizorkin type; applications to semilinear elliptic boundary problems.

Helmut WIELANDT. — **Mathematische Werke-Mathematical works. Vol. 2: Linear algebra and analysis.** — Edited by Bertram Huppert and Hans Schneider. — Un vol. relié, 18×25, de XX, 632 p. — Walter de Gruyter, Berlin, 1996.

Volume 2 contains the works on matrix theory. Research papers are arranged chronologically and often accompanied by comments from acknowledged experts describing the context and outlining further developments. Included are also the famous and influential Madison lectures on the analytic theory of matrix groups, and - now available to the public for the first time - Wielandt's series of contributions to the mathematical treatment of complex eigenvalue problems prepared when he was assigned to the Kaiser-Wilhelm-Institut for Fluid Dynamics in Göttingen during the Second World War. The Tübingen lecture notes on selected topics of permutation groups are published as appendix.

Algebraic groups and Lie groups: a volume of papers in honour of the late R.W. Richardson. — Edited by Gus Lehrer, with A.L. Carey, J.B. Carrell, M.K. Murray, T.A. Springer. — Australian Mathematical Society lecture series, vol. 9. — Un vol. broché, 15,5×23, de 384 p. — Prix: £32.50. — Cambridge University Press, Cambridge, 1997.

The central theme of this book reflects the interests of R.W. Richardson, with connections between representation theory and the structure and geometry of algebraic groups. Particular topics addressed include Kazhdan-Lusztig theory, quantum groups, spherical varieties, symmetric varieties, cohomology of varieties, purity, Schubert geometry, invariant theory and symmetry breaking. The theory of canonical bases and their geometric context is a theme of several of the contributions, as is the orbit theory of algebraic group actions on affine varieties.

R.C. VAUGHAN. — **The Hardy-Littlewood method.** — Second edition. — Cambridge tracts in mathematics, vol. 125. — Un vol. relié, 16×23,5, de VII, 232 p. — Prix: £35.00. — Cambridge University Press, Cambridge, 1997.

The Hardy-Littlewood method is a means of estimating the number of integer solutions of equations and was first applied to Waring's problem on representations of integers by sums of powers. This introduction to the method deals with its classical forms and outlines some of the more recent developments. Now in its second edition, it has been fully updated; extensive revisions have been made and a new chapter added to take account of major advances by Vaughan and Wooley. The reader is expected to be familiar with elementary number theory.

P. WOJTASZCZYK. — **A mathematical introduction to wavelets.** — London Mathematical Society student texts, vol. 37. — Un vol. broché, 15,5×23, de XII, 261 p. — Prix: £13.95 (relié: £40.00). — Cambridge University Press, Cambridge, 1997.

Starting with a detailed and self-contained discussion of the general construction of one dimensional wavelets from multiresolution analysis, the book presents in detail the most important wavelets: spline wavelets, Meyer's wavelets and wavelets with compact support. It then moves to the corresponding multivariable theory and gives genuine multivariable examples. Wavelet decompositions in L^p-spaces, Hardy spaces and Besov spaces are discussed and wavelet characterisations of those spaces are provided. Also included are some additional topics like periodic wavelets or wavelets not associated with a multiresolution analysis.

Jürgen JOST. — **Compact Riemann surfaces: an introduction to contemporary mathematics.** — Translated by R.R. Simha. — Universitext. — Un vol. broché, 16×23,5, de XIV, 291 p. — Prix: DM 68.00. — Springer, Berlin, 1997.

Although Riemann surfaces are a time-honoured subject, this book is novel in its broad perspective that systematically explores the connections with other fields of mathematics. It can serve as an introduction to contemporary mathematics as a whole, as it develops background material from algebraic topology, differential geometry, the calculus of variations, elliptic partial differential equations, and algebraic geometry. It is unique among textbooks on Riemann surfaces in including an introduction to Teichmüller theory. The analytic approach is likewise new, as it is based on the theory of harmonic maps.

Michael MONASTYRSKI. — **Modern mathematics in the light of the Fields medals.** — Un vol. broché, 13×20, de XV, 160 p. — Prix: $35.00. — A.K. Peters, Wellesley Mass., 1997

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

Garrett BIRKOFF, Saunders MAC LANE. — **A survey of modern algebra.** — 5th edition. — AKP classics. — Un vol. broché, 16×23, de XI, 499 p. — Prix: US$59.00. — A.K. Peters, Wellesley, Mass. 1997.

This classic text introduces abstract algebra using familiar and concrete examples that illustrate each concept as it is presented. It covers such topics as the role of careful proof in algebra; linear algebra as grounded in geometry; groups as expressions of symmetry; subgroups and subsystems leading to lattice theory, etc. This fundamental text continues to show that the vital aspects of modern mathematics can be presented to undergraduates in an effective and innovative manner.

Jacques LAFONTAINE. — **Introduction aux variétés différentielles.** — Collection Grenoble Sciences. — Un vol. broché, 17×25, de 299 p. — Prix: FF 150.00. — Presses universitaires de Grenoble, Grenoble, 1996.

Sont abordées les principales notions de base de la géométrie différentielle: variétés différentielles, espaces tangent et cotangent, champs de vecteurs, formes différentielles. Les prérequis nécessaires sont en particulier le calcul différentiel dans les espaces euclidiens. Cette publication a pour objectif d'être un ouvrage de base et propose également des exercices très classiques pour l'étudiant et le débutant en la matière, d'autre plus délicats pour l'enseignant, le chercheur ou l'étudiant de niveau plus avancé. Les solutions d'un bon nombre sont données en fin de volume.

Daniel ALIBERT. — **Exercices corrigés d'analyse: avec rappels de cours.** — Tome 1: Relations - Applications - Suites - Etude locale des fonctions. — Tome 2: Etude globale des

fonctions - Intégration - Equations différentielles. — Collection Grenoble Sciences. — 2 vol. brochés, 17×25, de 142 et 134 p. respectivement. — Prix: FF 90.00 chaque vol. — Presses universitaires de Grenoble, Grenoble, 1991-1992.

Les exercices corrigés d'analyse avec rappels de cours de Daniel Alibert recouvrent le programme de première année des premiers cycles scientifiques orientés vers les mathématiques et la physique (science et structure de la matière, science et technologie). Ils correspondent également à l'essentiel du programme des classes de mathématiques supérieures. Ces exercices sont issus des travaux des sections de premier cycle de l'Université de Grenoble où la stratégie pédagogique utilisée s'appuyait sur le débat scientifique et l'analyse critique des conjectures et des erreurs.

Jean-Pierre DEMAILLY. — **Analyse numérique et équations différentielles.** — Nouvelle édition. — Collection Grenoble Sciences. — Un vol. broché, 17×25, de 309 p. — Prix: FF 190.00. — Presses universitaires de Grenoble, Grenoble, 1996.

Le lecteur trouvera dans cet ouvrage, d'abord une introduction à diverses techniques importantes de l'analyse numérique (interpolation polynomiale, méthodes d'intégration numérique et méthodes itératives pour la résolution d'équations). Puis un exposé des résultats de base sur l'existence, l'unicité et la régularité des solutions des équations différentielles, incluant une étude détaillée des équations usuelles du premier et du second ordre, des équations et systèmes linéaires à coefficients constants. La dernière partie de l'ouvrage est consacrée à la description des méthodes numériques à un pas ou multi-pas, avec une étude comparative de la stabilité et du coût en temps de calcul.

L'Europe mathématique: histoires, mythes, identités = Mathematical Europe: history, myth, identity. — Sous la direction de Catherine Goldstein, Jeremy Gray et Jim Ritter. — Un vol. broché, 16×23,5, de X, 575 p. — Prix: FF 190.00. — Editions de la Maison des Sciences de l'homme, Paris, 1996.

Une image courante des mathématiques en fait une discipline née en Europe et se répandant ensuite dans le monde entier. L'histoire des sciences récente récuse ce récit simpliste en montrant les formations mathématiques et les interactions en jeu, tant à l'intérieur qu'à l'extérieur de l'Europe. Synthétisant ces résultats, ce livre va plus loin et cherche à comprendre la raison d'être et les modalités du récit usuel, ainsi que la constitution concrète des mathématiques européennes. De l'Extrême-Orient aux centres fluctuants de l'Europe géographique, de l'Antiquité classique aux nations modernes, des facteurs d'intégration aux dissonances, la recherche de l'Europe mathématique passée mène à la réflexion présente sur les rapports entre sciences et sociétés.

Integrable systems and foliations: feuilletages et systèmes intégrables. — Edited by Claude Albert, Robert Brouzet, Jean Paul Dufour. — Progress in mathematics, vol. 145. — Un vol. relié, 14×24, de VI, 212 p. — Prix: SFr. 118.00. — Birkhäuser, Boston, 1997.

The articles in this volume are an outgrowth of a colloquium "Systèmes intégrables et feuilletages", which was held in honor of the sixtieth birthday of Pierre Molino. The topics cover the broad range of mathematical areas which were of keen interest to Molino, namely, integral systems and more generally symplectic geometry and Poisson structures, foliations and Lie transverse structures, transitive structures, and classification problems.

Sergei I. GELFAND, Yuri I. MANIN. — **Methods of homological algebra.** — Un vol. relié, 16,5×24, de XVIII, 372 p. — Prix: DM 128.00. — Springer, Berlin, 1996.

Homological algebra first arose as a language for describing topological prospects of geometrical objects. As with every successful language it quickly expanded its coverage and semantics, and its contemporary applications are many and diverse. This approach is based on the systematic use of the language and ideas of derived categories and derived functors. Relations with standard cohomology theory (sheaf cohomology, spectral sequences, etc.) are described. In most cases complete proofs are given. Basic concepts and results of homotopical algebra are also presented.

Jean-Pierre GINISTI. — **La logique combinatoire.** — Que sais-je, vol. 3205. — Un vol. broché, 11,5×17,5, de 126 p. — Presses Universitaires de France, Paris, 1997.

Théorie des combinaisons applicatives. — Théorie des combinateurs élémentaires. — Algèbre des combinateurs et applications. — Schönfinkel, Curry et Church. Règles, paradoxes et prélogique. — Théorie de la fonctionnalité et logique illative. — Un système déviant: la PFL de Quine.

Peter HILTON, Derek HOLTON, Jean PEDERSEN. — **Mathematical reflections: in a room with many mirrors.** — Undergraduate texts in mathematics. — Un vol. relié, 18,5×24,5, de XVI, 351 p. — Prix: DM 49.00. — Springer, Berlin, 1997.

This book presents eight topics that serve to illustrate the unity of mathematical thought as well as the diversity of mathematical ideas. Drawn from both "pure" and "applied" mathematics, they include: spirals in nature and in mathematics; the modern topic of fractals and the ancient topic of Fibonacci numbers; Pascal's triangle and paper folding - two topics where geometry, number theory, and algebra meet and interact; and modular arithmetic and the arithmetic of the infinite. The final chapter presents some ideas about how mathematics should be done, and hence, how it should be taught; these ideas are referred to throughout the text whenever mathematical strategy and technique are at issue.

John W. DAWSON, Jr. — **Logical dilemmas: the life and work of Kurt Gödel.** — Un vol. relié, 16×24, de XIV, 361 p. — Prix: US$49.95. —A.K. Peters, Wellesley, MA, 1997.

This definitive biography of the logician and philosopher Kurt Gödel is the first in-depth account to integrate details of his personal life with the work and is based on the author's intensive study of Gödel's papers and correspondence. Dawson, a logician and historian of science, examines the life of this driven man whose work on the foundation of mathematics has fundamentally changed our thoughts on these subjects and has stimulated much the research conducted in this century. He further explores the relationship between Gödel's personality and his scientific achievements and describes the impact Gödel's results have had on our modern world view.

Frank W.J. OLVER. — **Asymptotics and special functions.** — AKP classics. — Un vol. relié, 16×24, de XVIII, 572 p. — Prix: US$69.00. — A.K. Peters, Wellesley, MA, 1997.

While the main focus of the book is asymptotics, Olver expertly interweaves asymptotic theory with a systematic development of most of the important special functions. Among the topics covered are asymptotic theories of definite integrals containing a parameter, ordinary differential equations, and sums and sequences. Special functions are introduced in chapter 2 and are developed throughout the book. This classic text is intended for graduate mathematicians, physicists, and engineers and can be used both as a basis for instructional courses and as a reference tool.

Trees. — Workshop in Versailles, June 14-16, 1995. — Edited by Brigitte Chauvin, Serge Cohen, Alain Rouault. — Progress in probability, vol. 40. — Un vol. relié, 16×24, de 155 p. — Prix: SFr. 78.00. — Birkhäuser Verlag, Basel, 1996.

The Workshop on Trees, held in Versailles from June 14-16, 1995, brought together specialists working in different areas of mathematics where tree structures are involved. For the first time, the very different aspects of trees are presented here in one volume. The articles are organized in four sections: disordered systems, algorithms, probability, *p*-adic analysis.

Richard H. CUSHMAN, Larry M. BATES. — **Global aspects of classical integrable systems.** — Un vol. relié, 17×24, de XVI, 435 p. — Prix: SFr. 68.00. — Birkhäuser Verlag, Basel, 1997.

This book gives a uniquely complete description of the geometry of the energy momentum mapping of five classical integrable systems : the 2-dimensional harmonic oscillator, the geodesic flow on the 3-sphere, the Euler top, the spherical pendulum and the Lagrange top. It presents for the first time in book form a general theory of symmetry reduction which allows one to reduce the symmetries in the spherical pendulum and the Lagrange top. Also the monodromy obstruction to the existence of global action angle coordinates is calculated for the spherical pendulum and the Lagrange top.

R. Todd OGDEN. — **Essential wavelets for statistical applications and data analysis.** — Un vol. relié, 16×24, de XVIII, 206 p. — Prix: SFr. 68.00. — Birkhäuser, Boston, 1997.

Features: Accessible, clearly presented background material. Examples presented throughout the book. Variety of statistical applications. Intuitive style of presentation. Web site for book "http://www.birkhäuser.com/books/isbn/0-8176-3864-4", with additional resources, includes S-plus software code functions for graphics used in the book. — *Contents:* Why wavelets. Wavelets: a brief introduction. Basic smoothing techniques. Elementary statistical applications. Wavelets features and examples. Wavelet-based diagnostics. Some practical issues. Other applications. Data adaptive wavelet thresholding. Generalizations and extensions.

Neil CHRISS, Victor GINZBURG. — **Representation theory and complex geometry.** — Un vol. relié, 18×25,5, de X, 495 p. — Prix: SFr. 108.00. — Birkhäuser, Boston, 1997.

This volume is an attempt to provide an overview of some of the recent advances in representation theory from a geometric standpoint. The first half of the book fills the gap between the standard knowledge of a beginner in Lie theory and the much wider background needed by the working mathematician. The chapters which form the heart of the book, present a uniform approach to representation theory of three quite different objects: Weyl groups, Lie algebra sl_n, and Iwahori-Hecke algebra. Some results are new, with complete proofs, not to be found elsewhere in the literature. The techniques developed are quite general and can be successfully applied to such other areas of mathematics, as quantum groups, affine Lie algebras, and quantum field theory.

Alexander L. SKUBACHEVSKII. — **Elliptic functional differential equations.** — Operator theory, vol. 91. — Un vol. relié, 17×24, de VIII, 293 p. — Prix: SFr. 148.00. — Birkhäuser Verlag, Basel, 1997.

Boundary value problems for elliptic differential-difference equations have some astonishing properties. The purpose of this book is to present for the first time general results concerning solvability and spectrum of these problems, a priori estimates and smoothness of solutions. The approach is based on the properties of elliptic operators and difference operators in Sobolev spaces. The most important features distinguishing this work are applications to

different fields of science. The methods in this book are used to obtain new results regarding the solvability of nonlocal elliptic boundary value problems and the existence of Feller semigroups for multidimensional diffusion processes.

Alexander Ya. SHKLYAR. — **Complete second order linear differential equations in Hilbert spaces.** — Operator theory, vol. 92. — Un vol. relié, 17×24, de XII, 215 p. — Prix: SFr. 128.00. — Birkhäuser Verlag, Basel, 1997.

This monograph is an attempt to present a unified systematic theory of second order equations including well-posedness of the Cauchy problem as well as the Dirichlet and Neumann problems; initial (boundary) conditions ensuring solvability of boundary-value problems; boundary behavior and extension of solutions on a finite interval; stability and stabilization of solutions at infinity; and boundary-value problems on a semi-line. The theory is developed in a special but important case which can be considered as model.

J.F. JARDINE. — **Generalized etale comohology theories.** — Progress in mathematics, vol. 146. — Un vol. relié, 16×24, de X, 317 p. — Prix: SFr. 98.00. — Birkhäuser, Boston, 1997.

A generalized etale cohomology is a theory which is represented by a presheaf of spectra on an etale site for an algebraic variety, in analogy with the way an ordinary spectrum represents a cohomology theory for spaces. Examples include etale cohomology and etale K-theory. This book gives new and complete proofs of both Thomason's descent theorem for Bott periodic K-theory and the Nisnevich descent theorem. In doing so, it exposes most of the major ideas of the homotopy theory of presheaves of spectra, and generalized etale homology theories in particular.

Yu. I. MANIN. — **Selected papers of Yu. I. Manin.** — World scientific series in 20th century mathematics, vol. 3. — Un vol. relié, 18×25,5, de XII, 600 p. — Prix: US$86.00. — World Scientific, Singapore, 1996.

The book is a collection of research and review articles in several areas of modern mathematics and mathematical physics published in the span of three decades. The ICM Kyoto talk "Mathematics as Metaphor" summarises the author's view on mathematics as an outgrowth of natural language. *Contents:* Algebraic geometry — Modular forms and diophantine equations — Differential equations and mathematical physics.

A mathematician and his mathematical work: selected papers of S.S. Chern. — Edited by S.Y. Cheng, P. Li, G. Tian. — World scientific series in 20th century mathematics, vol. 4. — Un vol. relié, 18×25,5, de XIV, 707 p. — Prix: US$86.00. — World Scientific, Singapore, 1996.

This volume is about the life and work of Shiing-Shen Chern (1911-), one of the leading mathematicians of this century. The book contains personal accounts by some friends, together with a summary of the mathematical works by Chern himself. This is the first time that a collected volume is published which includes all his papers since 1988.

Kai Lai CHUNG. — **Green, Brown, and probability.** — Un vol. broché, 15,5×22, de XII, 106 p. — Prix: US$10.00 (relié: US$18.00). — World Scientific, Singapore, 1995.

This volume shows modern probabilistic methods in action: Brownian Motion Process as applied to the electrical phenomena investigated by Green et al., beginning with the Newton-Coulomb potential and ending with solutions by first and last exits of Brownian paths from conductors.

Agostino PRÁSTARO. — **Geometry of PDEs and mechanics.** — Un vol. relié, 16,5×22,5, de X, 750 p. — Prix: US$78.00. — World Scientific, Singapore, 1996.

This volume presents the theory of partial differential equations (PDEs) from a modern geometric point of view so that PDEs can be characterized by using either technique of differential geometry or algebraic geometry. This allows us to recognize the richness of the structure of PDEs. It presents, for the first time, a geometric theory of non-commutative (quantum) PDEs and gives a general application of this theory to quantum field theory and quantum supergravity.

Quantum topology. — Edited by Louis H. Kauffman, Randy A. Baadhio. — Series on knots and everything, vol. 3. — Un vol. broché, 15,5×21,5, de XII, 375 p. — Prix: US$38.00 (relié: US$68.00). — World Scientific, Singapore, 1995.

This book is a review volume of on-going research activity. The papers derive from talks given at the Special Session on Knot and Topological Quantum Field Theory of the American Mathematical Society held at Dayton, Ohio in the Fall of 1992. The book consists of a self-contained article by Kauffman, entitled *Introduction to Quantum Topology* and eighteen research articles by participants in the special session. This book should provide a useful source of ideas and results for anyone interested in the interface between topology and quantum field theory.

Collected papers of V.K. Patodi. — Edited by M.F. Atiyah, M.S. Narasimhan. — Un vol. relié, 17,5×25,5, de X, 294 p. — Prix: US$58.00. — World Scientific, Singapore, 1996.

Vijay Kumar Patodi was a brilliant Indian mathematician who made, during his short life, fundamental contributions to the analytic proof of the index theorem and to the study of differential geometric invariants of manifolds. This set of collected papers includes his path-breaking papers on the McKean-Singer conjecture and the analytic proof of Riemann-Roch-Hirzebruch theorem for Kähler manifolds. It also contains his celebrated joint papers on the index theorem and the Atiyah-Patodi-Singer invariant.

Zhe-Xian WAN. — **Geometry of matrices.** — In memory of Professor L.K. Hua (1910-1985). — Un vol. relié, 16,5×22,5, de IX, 376 p. — Prix: US$48.00. — World Scientific, Singapore, 1996.

The present monograph is a state-of-the-art survey of the geometry of matrices whose study was initiated by L.K. Hua in the forties. *Contents:* Linear algebra over division rings. — Affine geometry and projective geometry. — Geometry of rectangular matrices. — Geometry of alternate matrices. — Geometry of symmetric matrices. — Geometry of Hermitian matrices.

100 ans après Th.-J. Stieltjes = 100 years after Th.-J. Stieltjes. — Edité par J.-B. Hiriart-Urruty. — Annales de la Faculté des Sciences de Toulouse, Mathématiques, numéro spécial.— Un vol. broché, 16,5×23,5, de 215 p. — Université Paul Sabatier, Toulouse, 1996.

L'année universitaire 1994-1995 a été l'occasion de marquer, de différentes manières, en France et aux Pays-Bas, le centième anniversaire de la mort à Toulouse du mathématicien Th.-J. Stieltjes. Le point d'orgue des manifestations à Toulouse aura été le colloque de deux jours organisé à l'Université Paul-Sabatier au mois de mars 1995. Dans ce numéro spécial des *Annales de la Faculté des Sciences de Toulouse* figurent les versions écrites des conférences plénières faites à cette occasion.

Srishti D. CHATTERJI. — **Cours d'analyse, 1: Analyse vectorielle.** — Un vol. broché, 16×24, de XXIII, 592 p. — Prix: SFr. 92.00. — Presses polytechniques et universitaires romandes, Lausanne, 1997.

L'objectif principal du premier volume de ce Cours d'Analyse en trois volumes est la présentation du théorème de Stokes généralisé pour les sous-variétés différentielles de dimension k dans $\mathbf{R}^N$. Ce théorème constitue un outil indispensable pour l'analyse dans les variétés et il est une généralisation naturelle des théorèmes dans $\mathbf{R}^2$ et $\mathbf{R}^3$ de Gauss, Green et Stokes; ces derniers sont présentés dans le cadre de l'analyse vectorielle dans $\mathbf{R}^2$ et $\mathbf{R}^3$ sous une forme habituellement utilisée par les ingénieurs et les physiciens. Leur généralisation complète dans $\mathbf{R}^N$ exige le recours à la théorie des formes différentielles qui est développée en détail dans cet ouvrage.

Michael ASCHBACHER. — **3-transposition groups.** — Cambridge tracts in mathematics, vol. 124. — Un vol. relié, 16×23,5, de VII, 260 p. — Prix: £35.00. — Cambridge University Press, Cambridge, 1997.

Part I of this book contains the first published proof of Fischer's Theorem. Prerequisites consist only of that part of an introductory undergraduate course in abstract algebra covering groups and linear algebra, plus some material from the author's earlier book, *Finite group theory,* on the elementary theory of finite groups. Parts II and III are aimed at specialists in finite groups. They establish the existence, uniqueness, and structural results for the Fischer groups, necessary for the classification of the finite simple groups.

Edward F. VONESH, Vernon M. CHINCHILLI. — **Linear and nonlinear models for the analysis of repeated measurements.** — Statistics: textbooks and monographs, vol. 154. — Un vol. relié, 16×23,5, de XII, 560 p. + 1 disquette. — Prix: US$75.00. — Marcel Dekker, New York, 1997.

Focusing on longitudinal studies and experimental situations where units are randomized to treatment groups, this book presents the generalized multivariate analysis of variance, the random coefficient growth curve, and the linear mixed effects models... a nonlinear version of the generalized multivariate analysis of variance model... a Gaussian-based nonlinear mixed effects model... a generalized non-linear mixed effects model... generalized estimating equations for various estimating techniques... and more.

Hiroki TANABE. — **Functional analytic methods for partial differential equations.** — Pure and applied mathematics, vol. 204. — Un vol. relié, 16×23,5, de VII, 414 p. — Prix: US$150.00. — Marcel Dekker, New York, 1997.

Examining evolution equations in Banach spaces, this book furnishes a slightly simplified, self-contained proof of Agmon-Douglis-Nirenberg's L^p estimates for boundary value problems... addresses the theory of function spaces, including interpolation inequalities, the Galgliardo-Nirenberg inequality, and Sobolev's imbedding theorems... describes adjoint boundary value problems... offers recent results on parabolic and hyperbolic equations... illustrates the solvability of retarded functional differential equations in Hilbert spaces... gives results on control problems... and much more.

Fan R.K. CHUNG. — **Spectral graph theory.** —Regional conference series in mathematics, No. 92. — Un vol. broché, 18×25,5, de XI, 207 p. — Prix: £20.00. — Oxford University Press, Oxford, 1997.

This monograph is an intertwined tale of eigenvalues and their use in unlocking a thousand secrets about graphs. The stories will be told - how the spectrum reveals fundamental properties

of a graph, how spectral graph theory links the discrete universe to the continuous one through geometric, analytic and algebraic techniques, and how, through eigenvalues, theory and applications in communications and computer science come together in symbiotic harmony. This book is based on 10 lectures given at the CBMS workshop on spectral graph theory in June 1994 at Fresno State University.

Finsler geometry. — Joint Summer Research Conference on Finsler Geometry, July 16-20, 1995, Seattle, Washington. — Edited by David Bao, Shiing-shen Chern, Zhongmin Shen. — Contemporary mathematics, vol. 196. — Un vol. broché, 18×25,5, de VII, 310 p. — Prix: £47.00. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1996.

The editors of this volume have provided comprehensive and informative "capsules" of presentations and technical reports. This was facilitated by classifying the papers into the following separate sections: Finsler geometry over the reals, complex Finsler geometry, generalized Finsler metrics, applications to biology, engineering, and physics, applications to control theory, applications to relativistic field theory. Each section contains a preface that provides a coherent overview of the topic and includes an outline of the current directions of research and new perspectives. A short list of open problems concludes each contributed paper.

Victor KAC. — **Vertex algebras for beginners.** — University lecture series, vol. 10. — Un vol. broché, 18×25,5, de VIII, 141 p. — Prix: £18.50. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1997.

The notion of a vertex algebra was introduced ten years ago by Richards Borcherds. This is a rigorous mathematical definition of the chiral part of a 2-dimensional quantum field theory studied intensively by physicists since the landmark paper of Belavin, Polyakov and Zamolodchikov. However, implicitly this notion was known to physicists much earlier. Some of the most important precursors are Wightman axioms and Wilson's notion of the operator product expansion. In fact, the axioms of a vertex algebra can be deduced from Wightman axioms. The exposition of these two sections is somewhat terse. The rest of the book is motivated by these sections but can be read independently of them.

Terry A. LORING. — **Lifting solutions to perturbing problems in C^*-algebras.** — Fields Institute monographs, vol. 8. — Un vol. relié, 18,5 x 26, de IX, 165 p. — Prix: £35.00. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1997.

The nature of C^*-algebras is such that one cannot study perturbation without also studying the theory of lifting and the theory of extensions. Approximation questions involving representations of relations in matrices and C^*-algebras are the central focus of this volume. A variety of approximation techniques are unified by translating them into lifting problems: from classical questions about transitivity of algebras of operators on Hilbert spaces to recent results in linear algebra. One chapter is devoted to Lin's theorem on approximating almost normal matrices by normal matrices.

David DRAIN. — **Statistical methods for industrial process control.** — Un vol. relié, 16×23,5, de XV, 456 p.— Chapman & Hall, New York, 1997.

The book begins with coverage of essential statistical concepts, including causal relationships and application of knowledge about patterns or variation to designing sample schemes. This material provides the basis for understanding the material on ensuring that measuring

equipment is capable of measuring important parameters with the requisite precision, accuracy and stability. With this foundation, the book teaches readers the statistical process control methods needed to stabilize the process.

Anatole KATOK, Boris HASSELBLATT. — **Introduction to the modern theory of dynamical systems.** — With a supplement by Anatole Katok and Leonardo Mendoza. — Encyclopedia of mathematics and its applications, vol. 54. — Un vol. broché. 16×23,5, de XVIII, 802 p. — Prix: £30 (relié: £65.00). — Cambridge University Press, Cambridge, 1997.

This book provides the first self-contained comprehensive exposition of the theory of dynamical systems as a core mathematical discipline closely intertwined with most of the main areas of mathematics. The book begins with the discussion of several elementary but fundamental examples. These are used to formulate a program for the general study of asymptotic properties and to introduce the principal theoretical concepts and methods. The main theme of the second part of the book is the interplay between local analysis near individual orbits and the global complexity of the orbit structure. The third and fourth parts develop the theories of low-dimensional dynamical systems and hyperbolic dynamical systems in depth. Over 400 exercises are included in the text.

Arrow logic and multi-modal logic. — Edited by Maarten Marx, László Pólos, and Michael Masuch. — Studies in logic, language and information. — Un vol. broché, 15×23, de XIV, 247 p. — Prix: £14.95 (relié: £40.00). — Center for the Study of Language and Information, Stanford, California & The European Association for Logic, Language and Information, distributed by Cambridge University Press, Cambridge, 1996.

Arrow logic started as an attempt to give a general account of the logic of transitions. The generality of the approach provided a wide application area ranging from philosophy to computer science. The book gives a comprehensive survey of logical research within and around arrow logic. The logic of transitions - arrow logic - can be studied from two different perspectives, and by two (complementary) methodologies: modal logic and the algebra of relations.

Ib MADSEN and Jørgen TORNEHAVE. — **From calculus to cohomology: de Rham cohomology and characteristic classes.** — Un vol. broché, 17×25, de VII, 286 p. — Prix: £16.95 (relié: £50.00). — Cambridge University Press, Cambridge, 1997.

De Rham cohomology is the cohomology of differential forms. This book offers a self contained exposition to this subject and to the theory of characteristic classes from the curvature point of view. The first 10 chapters study cohomology of open sets in Euclidean space, treat smooth manifolds and their cohomology and end with integration of manifolds. The last 11 chapters cover Morse theory, index of vector fields, Poincaré duality, vector bundles, connections and curvature, Chern and Euler classes and Thom isomorphism, and the book ends with the general Gauss-Bonnet theorem.

Applications of time series analysis in astronomy and meteorology. — Edited by T. Subba Rao, M.B. Priestley and O. Lessi. — Un vol. relié, 16,5×24, de XXIII, 465 p. — Prix: £65.00. — Chapman and Hall, London, distributed by International Thomson Publishing Services, Andover, Hampshire, U.K., 1997.

This book brings together a series of papers by experts in these fields evenly devoted to the theory and methodology of time series and to its applications to astronomy, meteorology and climatology. The topics covered include detection of periodicities, spectral analysis of unequally spaced data, detection of change points and higher order spectral methods of non-linear and non-Gaussian signals. Estimation of fractal dimension and applications of wavelet methods to astronomy are also considered.

Mathematics masterclasses: stretching the imagination. — Edited by Michael Sewell. — Un vol. broché, 15,5×23,5, de xvii, 233 p. — Prix: £14.95. — Oxford University Press, Oxford, 1997.

From the dynamics of dinosaurs and how to weigh them to the tension in a soap film, from the limits of storage in a computer to games of chance, the diversities of weather, chaos, water waves, and seventeengons, this book is an exciting collection of unusual topics from both pure and applied mathematics. Each chapter contains written versions of a $2^1/2$ hour class, designed to stretch the imagination of young and would-be mathematicians and, more especially, to fire the enthusiasm of students from age 13 upwards.

R.S. ISMAGILOV. — **Representations of infinite-dimensional groups.** — Translations of mathematical monographs, vol. 152. — Un vol. relié, 18,5×26, de x, 197 p. — Prix: £65.00. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1996.

This book is mainly devoted to representations of two classes of infinite-dimensional groups that appear in problems close to mathematical analysis. The first class consists of current groups, i.e., groups of mappings (measurable, smooth, etc.) of a given set to a given group. The second class consists of diffeomorphism groups of smooth manifolds and their "large" (infinite-dimensional) subgroups.

Dmitri FOMIN, Sergey GENKIN, Ilia ITENBERG. — **Mathematical circles (Russian experience).** — Translated from the Russian by Mark Saul. — Mathematical world, vol. 7. — Un vol. broché, 18×25,5, de xi, 272 p. — Prix: £20.00. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1996.

This is a book produced by a remarkable cultural circumstance in the former Soviet Union which fostered the creation of groups of students, teachers, and mathematicians called "mathematical circles". It is a book of mathematical recreations and, at the same time, a book containing vast theoretical and problem material in main areas of what authors consider to be "extracurricular mathematics". The book is based on a unique experience gained by several generations of Russian educators and scholars.

Tristan NEEDHAM. — **Visual complex analysis.** — Un vol. relié, 16×24, de xxiii, 592 p. — Prix: £32.95. — Clarendon Press, Oxford, distributed by Oxford University Press, Oxford, 1997.

This first course on complex analysis brings a beautiful and powerful subject to life by consistently using geometry (not calculation) as the means of explanation. It contains: new geometric arguments that yield a more intuitive and elementary approach than the conventional; over 500 diagrams to illuminate the geometric reasoning; no advanced prerequisites; unusually wide-ranging exercises that investigate important and interesting facts; penetrating, yet elementary, treatments of such important topics as Möbius transformations, non-Euclidean geometry, the vector-field interpretation of complex integration; ways to harness the power of the modern PC, to witness general theorems and gain theoretical insights.

Applications of combinatorial mathematics. — Edited by Chris Mitchell. — The Institute of Mathematics and its Applications conference series, vol. 60. — Un vol. relié, 16,5×24, de x, 241 p. — Prix: £75.00. — Clarendon Press, Oxford, distributed by Oxford University Press, Oxford, 1997.

The IMA Conference on the "Applications of Combinatorial Mathematics" was held at Wadham College, Oxford, between the 14th and the 16th of December 1994. In the last thirty

years, combinatorial mathematics has found itself at the heart of many technological applications. This conference was intended to give an opportunity for papers to be presented on a wide range of different applications of combinatorics, covering topics as diverse as: neural networks, cryptography, radio frequency assignment for mobile telecommunications, coding theory, sequences for communications applications, interconnection networks, data types, knot theory, radar, parallel processing, network reliability, formal specification of programs and protocols, and combinatorial optimisation.

Graph connections: relationships between graph theory and other areas of mathematics. — Edited by Lowell W. Beineke and Robin J. Wilson. — Oxford lecture series in mathematics and its applications, vol. 5. — Un vol. relié, 17×24, de XI, 291 p. — Prix: £35.00. — Clarendon Press, Oxford, distributed by Oxford University Press, Oxford, 1997.

The purpose of this book is to inform mathematicians about the applicability of graph theory in other areas of mathematics. This is achieved through a series of carefully edited expository chapters, each devoted to a different field and written by an expert: Introduction, enumeration, number theory, partial orders, first-order logic, linear algebra, matroids, codes, groups, geometry, topology, knots, probability, statistics, computing, artificial neural networks, international finance.

Progress in differential geometry. — Edited by K. Shiohama. — Advanced studies in pure mathematics, vol. 22. — Un vol. relié, 16×24, de 505 p. — Prix: £80.00. — Kinokuniya Company, Tokyo, distributed by Oxford University Press, Oxford, 1993.

This volume is a collection of twenty-five original papers and two survey articles concerning topics on differential geometry and global analysis. The survey article by Urakawa presents recent developments of spectral geometry of a noncompact complete Riemannian manifold. The survey article by Yamaguchi deals with the Lie algebra of all infinitesimal automorphisms of a differential system (or a Pfaffian system) on a manifold.

Gérald TENENBAUM, Michel MENDÈS FRANCE. — **Les nombres premiers.** — Que sais-je, vol. 571. — Un vol. broché, 11,5×17,5, de 127 p. — Presses Universitaires de France, Paris, 1997.

Répondant à des questions posées depuis l'Antiquité: y a-t-il beaucoup de nombres premiers?, comment se répartissent-ils?, etc. - , le domaine de la théorie analytique moderne des nombres premiers connaît depuis un siècle un essor sans précédent, dû notamment aux interactions avec celui des probabilités. Les tables de nombres premiers mettent en évidence un aspect chaotique, dont le désordre apparent s'accorde finalement avec des modèles aléatoires classiques, issus, par exemple, de phénomènes physiques. L'objectif de ce livre est de décrire, puis tenter de comprendre comment une suite aussi déterminée que celle des nombres premiers peut renfermer un telle part de hasard.

Extremal Riemann surfaces. — From the proceedings of the AMS Special Session with Related Papers, January 4-5, 1995, San Francisco, California. — Edited by J.R. Quine, Peter Sarnak. — Contemporary mathematics, vol. 201. — Un vol. broché, 18×25,5, de X, 243 p. — Prix: £37.50. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1997.

The book deals with a variety of extremal problems related to Riemann surfaces. Some papers deal with the identification of surfaces with longest systole for the length spectrum and the Jacobian. Parallels are drawn to classical questions involving extremal lattices. Other papers deal with maximizing or minimizing functions defined by the spectrum such as the heat kernel,

the zeta function, and the determinant of the Laplacian. There are discussions of Hurwitz surfaces and surfaces with large cyclic groups of automorphisms. Also discussed are surfaces which are natural candidates for solving extremal problems such as triangular, modular, and arithmetic surfaces. Other allied topics are theta identities, quadratic periods of Abelian differentials, Teichmüller disks, binary quadratic forms, and spectral asymptotics of degenerating hyperbolic three manifolds.

Operads. — Proceedings of Renaissance Conferences, Special Session and International Conference on Moduli Spaces, Operads, and Representation Theory / Operads and Homotopy Algebra, March 1995 / May-June 1995 Hartford, Connecticut / Luminy, France. — Edited by Jean-Louis Loday, James D. Stasheff, Alexander A. Voronov. — Contemporary mathematics, vol. 202. — Un vol. broché, $18 \times 25,5$, de IX, 443 p. — Prix: £60.00. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1997.

"Operads" are mathematical devices which model many sorts of algebras (such as associative, commutative, Lie, Poisson, alternative, Leibniz, etc., including those defined up to homotopy, such as A_∞-algebras). Since the notion of an operad appeared in the seventies in algebraic topology, there has been a renaissance of this theory due to the discovery of relationships with graph cohomology, Koszul duality, representation theory, combinatorics, cyclic cohomology, moduli spaces, knot theory, and quantum field theory.

Geometry and physics. — Proceedings of the conference at Aarhus University, Aarhus, Denmark. — Edited by J.E. Andersen, J. Dupont, H. Pedersen, A. Swann. — Lecture notes in pure and applied mathematics, vol. 184. — Un vol. broché, $17,5 \times 25,5$, de XII, 745 p. — Prix: US$ 175.00. — Marcel Dekker, New York, 1997.

Written by more than 50 experts, this reference presents the Seiberg-Witten invariants that facilitate the solution of open problems in Donaldson's theory... describes applications of the Seiberg-Witten invariants... analyzes moduli spaces of semi-stable bundles over Riemann surfaces... addresses operator algebras and topology... demonstrates the planar topological aspects of subfactors... examines symplectic geometry and Einstein metrics... discusses novel ways of computing curvature and holonomy for the determinant line bundle... elucidates the new topic of finite type invariants of three-manifolds and relations with nonperturbative quantum invariants... delineates recent work on a purely topological approach to physics-inspired invariants, etc.

Commutative ring theory. — Proceedings of the II International Conference. — Edited by P.-J. Cahen, M. Fontana, E. Houston, S.-E. Kabbaj. — Lecture notes in pure and applied mathematics, vol. 185. — Un vol. broché, $17,5 \times 25,5$, de XII, 470 p. — Prix: US$ 145.00. — Marcel Dekker, New York, 1997.

Exploring commutative algebra's connections with and applications to topological algebra and algebraic geometry, this book covers spectra of rings... dimension theory... chain conditions class groups... duals of ideals... Mori and Krull domains... Prüfer domains... integer-valued polynomials... semigroup rings... seminormalization and weak normalization... generators of ideals... homological aspects... etc. Over 580 literature citations are included.

Matrix-analytic methods in stochastic models. — Edited by S.R. Chakravarthy, A.S. Alfa. — Lecture notes in pure and applied mathematics, vol. 183. — Un vol. broché, $17,5 \times 25,5$, de XI, 375 p. — Prix: US$ 185.00. — Marcel Dekker, New York, 1997.

Based on the proceedings of the first International Conference on Matrix-Analytic Methods (MAM) in Stochastic Models held recently in Flint, Michigan, this resource book presents a general working knowledge of the field through carefully designed tutorial articles and

application papers. The book furnishes previously inaccessible information on MAM studies carried out in the former Soviet Union... introduces the Markovian arrival process... discusses the fitting of distributions to observed data... etc.

Stochastic processes and functional analysis. — Edited by J.A. Goldstein, N.E. Gretsky, J.J. Uhl, Jr. — Lecture notes in pure and applied mathematics, vol. 186. — Un vol. broché, 17,5×25,5, de XIX, 269 p. — Prix: US$75.00. — Marcel Dekker, New York, 1997.

This Festschrift presents a collection of papers given at a conference in honor of the 65th birthday of M.M. Rao. Featuring previously unpublished research articles the book offers contributions on themes such as persistency in Hamiltonian evolution equations... lattice gas models... Banach space theory... deterministic and stochastic differential equations... operator theory... etc.

Ross HONSBERGER. — **From Erdős to Kiev: problems of Olympiad caliber.** — The Dolciani mathematical expositions, vol. 17. — Un vol. broché, 16×23,5, de XII, 257 p. — Prix: £17.95. — The Mathematical Association of America, Washington, distributed by Cambridge University Press, Cambridge, 1996.

Ross Honsberger's love of mathematics comes through very clearly in *From Erdős to Kiev*. He presents intriguing, stimulating problems that can be solved with elementary mathematical techniques. It will give pleasure to motivated students and their teachers, but it will also appeal to anyone who enjoys a mathematical challenge. Most of the problems in the collection have appeared on national or international Olympiads or other contests. The problems included in this collection are taken from geometry, number theory, probability, and combinatorics. Solutions to the problems are included.

Joseph D.E. KONHAUSER, Dan VELLEMAN, Stan WAGON. — **Which way did the bicycle go?... and other intriguing mathematical mysteries.** — The Dolciani mathematical expositions, vol. 18. — Un vol. broché, 16×23,5, de XV, 235 p. — Prix: £14.95. — The Mathematical Association of America, Washington, distributed by Cambridge University Press, Cambridge, 1996.

This book contains the best problems selected from over 25 years of the Problem of the Week at Macalester College. Readers can compare their sleuthing talents with those of Sherlock Holmes, who made a bad mistake regarding the first problem in the collection: Determine the direction of travel of a bicycle that has left its tracks in a patch of mud. The collection contains a variety of other unusual and interesting problems in geometry, algebra, combinatorics, and number theory.

Number theory. — Séminaire de Théorie des Nombres à Paris, 1993-4. — Edited by Sinnou David. — London Mathematical Society lecture notes series, vol. 235. — Un vol. broché, 15,5×23, de 213 p. — Prix: £24.95. — Cambridge University Press, Cambridge, 1996.

The contributions in this book are based on the lectures delivered at the Séminaire de Théorie des Nombres de Paris during the academic year 1993-4. It is the fifteenth annual volume. This book covers the whole spectrum of number theory, and is composed of contributions from some of the best specialists worldwide. Together they constitute the latest developments in number theory that will be an invaluable resource for all workers in that area.

Constance REID. — **Julia: a life in mathematics.** — Spectrum series. — Un vol. relié, 21×21, de XI, 123 p. — Prix: £14.95. — The Mathematical Association of America, Washington, distributed by Cambridge University Press, Cambridge, 1996.

Julia is the story of Julia Bowman Robinson, the gifted and highly original mathematician who during her lifetime was recognized in ways that no other woman mathematician had ever been recognized. In 1976, she became the first woman mathematician elected to the National Academy of Sciences and in 1983 the first woman elected president of the American Mathematical Society. This book, profusely illustrated with previously unpublished personal and mathematical memorabilia, brings together in one volume the prizewinning "Autobiography of Julia Robinson" by her sister, the popular biographer Constance Reid, and three very personal articles about her work by outstanding mathematical colleagues.

Paul JAFFARD. — **Traité de topologie générale: en vue de ses applications.** — Mathématiques. — Un vol. broché, 15×22, de xv, 416 p. — Prix: FF228.00. — Presses Universitaires de France, Paris, 1997.

La topologie générale est l'une des structures fondamentales de l'analyse. L'auteur expose systématiquement dans ce livre les concepts et les résultats les plus souvent rencontrés. Il ne cherche pas à développer la théorie pour elle-même. Tout au contraire, il montre les moyens d'en faire un usage concret par la multiplication d'exemples comprenant des applications parmi les plus classiques. Il utilise dans ce livre des remarques et des résultats qui l'ont aidé et auxquels l'ont conduit ses lectures, ses recherches et son enseignement.

Yuri V. EGOROV, Bert-Wolfgang SCHULZE. — **Pseudo-differential operators, singularities, applications.** — Operator theory, vol. 93. — Un vol. relié, 17×24, de xiii, 349 p. — Prix: SFr. 168.00. — Birkhäuser Verlag, Basel, 1997.

This book grew out of lecture notes based on the DMV seminar held by the authors in Reisenburg-Günzburg, 12-19 July 1992. The modern theory of elliptic boundary value problems in domains having conical or edge singularities on the boundary as well as the classical theory of elliptic boundary value problems and the original Kondratiev theory are presented. This material forms the foundation for the second part of the book which contains a new construction of pseudo-differential operators with symbols corresponding to the singularities of the boundary of different dimensions. This allows in particular to obtain complete asymptotic expansions of solutions near these singularities.

Mikhail I. KADETS, Vladimir M. KADETS. — **Series in Banach spaces: conditional and unconditional convergence.** — Operator theory, vol. 94. — Un vol. relié, 17×24, de viii, 156 p. — Prix: SFr. 98.00. — Birkhäuser Verlag, Basel, 1997.

In the present book, the contemporary situation from the classical theorems up to new fundamental results, including those found by the authors, is presented. Complete proofs are given for all non-standard facts. The text contains many exercises and unsolved problems as well as an appendix about the similar problems in vector-valued Riemann integration. This book will be of use to graduate students and mathematicians interested in functional analysis.

Andreas KNAUF, Yakov G. SINAI. — **Classical nonintegrability, quantum chaos.** — With a contribution by Viviane Baladi. — DMV Seminar, vol. 27. — Un vol. broché, 17×24, de vi, 98 p. — Prix: SFr. 32.00. — Birkhäuser Verlag, Basel, 1997.

This book includes several lectures given at the DMV Seminar "Classical nonintegrability, quantum chaos". The aim of these lectures was to provide an introduction to the ideas and mathematical techniques of classical and quantum nonlinear dynamics. The lecture by Viviane Baladi gives a much-needed overview of the current literature and includes an informal discussion of the pertinent problems and results. The chapters on irregular scattering and on

expanding maps illustrate techniques in nonlinear dynamics using the simplest nontrivial examples. The chapters on quantum chaos and on Liouville surfaces stress a phase space geometry approach to semi-classical quantum theory.

Wilfrid HODGES. — **A shorter model theory.** — Un vol. broché, 15,5×23, de x, 310 p. — Prix: £22.95. — Cambridge University Press, Cambridge, 1997.

This is an up-to-date textbook of model theory taking the reader from first definitions to Morley's theorem and the elementary parts of stability theory. Besides standard results such as the compactness and omitting types theorems, it also describes various links with algebra, including the Skolem-Tarski method of quantifier elimination, model completeness, automorphism groups and omega-categoricity, ultraproducts, O-minimality and structures of finite Morley rank. The material on back-and-forth equivalences, interpretations and zero-one laws can serve as an introduction to applications of model theory in computer science.

William FULTON. — **Young tableaux: with applications to representation theory and geometry.** — London Mathematical Society student texts, vol. 35. — Un vol. broché, 15,5×23, de IX, 260 p. — Prix: £14.95 (relié: £40.00). — Cambridge University Press, Cambridge, 1997.

In the first part of the book the author develops the basic combinatorics of Young tableaux, including the remarkable constructions of "bumping" and "sliding" that can be used to make them into a monoid, and several interesting correspondences. In Part II these results are used to study representations of the symmetric and general linear groups. In Part III we see relations with geometry on Grassmanians and flag manifolds, including their Schubert subvarieties, and the related Schubert polynomials.

Martin A. GUEST. — **Harmonic maps, loop groups, and integrable systems.** — London Mathematical Society student texts, vol. 38. — Un vol. relié, 16×23,5, de XIII, 194 p. — Prix: £40.00 (broché: £14.95). — Cambridge University Press, Cambridge, 1997.

This is an accessible introduction to some of the fundamental connections between differential geometry, Lie groups, and integrable Hamiltonian systems. The specific goal of the book is to show how the theory of loop groups can be used to study harmonic maps. By concentrating on the main ideas and examples, the book leads up to topics of current research.

Velimir JURDJEVIC. — **Geometric control theory.** — Cambridge studies in advanced mathematics, vol. 51. — Un vol. relié, 16×23,5, de XVIII, 492 p. — Prix: £60.00. — Cambridge University Press, Cambridge, 1997.

The first part of the book describes geometric analysis of a control system, using the Lie bracket as the basic theoretic tool, and identifies an important class of systems, called Lie determined, whose solutions admit easy descriptions in terms of the enveloping Lie algebras and their integral manifolds. The second part of the book is devoted to the problem of optimal control. The theory of Lie-determined systems, further enriched by the maximum principle and the associated Hamiltonian formalism, forms the geometric foundations for problems of optimality.

Pierre MEUNIER. — **Exercices d'algèbre et d'analyse corrigés et commentés, 2.** — Mathématiques. — Un vol. broché, 15×22, de 254 p. — Prix: FF 148.00. — Presses Universitaires de France, Paris, 1997.

Ce livre propose des exercices sur les groupes et les actions de groupe avec des applications à l'arithmétique, à la géométrie et à la topologie, des exercices d'algèbre linéaire ou bilinéaire

et de nouveaux exercices relatifs aux fonctions et familles sommables avec la mise en évidence, à partir d'exemples, des principaux résultats classiques devant être connus des étudiants de classes préparatoires et des premières années d'Université: théorème de la convergence monotone, de la convergence dominée de Lebesgue, de Fubini, formule d'inversion de Fourier, formule de Plancherel, transformée de Fourier, produit de convolution.

Steven G. Krantz. — **A primer of mathematical writing: being a disquisition on having your ideas recorded, typeset, published, read, and appreciated.** — Un vol. broché, 18×25,5, de xv, 223 p. — Prix: £14.95. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1997.

This book is about writing in the professional mathematical environment. In this volume, the author addresses these nuts-and-bolts issues: syntax, grammar, structure, and style; mathematical exposition; use of the computer and TEX; e-mail etiquette; all aspects of publishing a journal article. His intent is to demonstrate to the reader how to operate successfully within the profession, how to write a letter of recommendation describing the research abilities of a candidate for promotion or tenure, and what a dean is looking for in a letter of recommendation. He further addresses some basic issues such as writing a book proposal to a publisher or applying for a job.

Keith Hannabuss. — **An introduction to quantum theory.** — Oxford graduate texts in mathematics, vol. 1. — Oxford science publications. — Un vol. relié, 16,5×24, de xiv, 380 p. — Prix: £35.00. — Oxford University Press, Oxford, 1997.

This book provides an introduction to quantum theory aimed especially at mathematics undergraduates. It employs algebraic techniques, and other topics studied in core mathematics courses, to explain the standard topics in quantum theory. This enables the formalism of quantum mechanics to be developed in a more thorough and satisfactory way than is usually encountered. It also permits the inclusion of some less traditional and more advanced topics, such as Bell's inequalities, coherent and squeezed states, and introductions to group representation theory, algebraic quantum theory, and quantum statistical mechanics. The last chapters discuss relativistic wave equations and elementary particle symmetries from a group-theoretical standpoint, rather than the customary Lie algebraic approach.

Cun-Quan Zhang. — **Integer flows and cycle covers of graphs.** — Pure and applied mathematics, vol. 205. — Un vol. relié, 16×23,5, de xii, 379 p. — Prix: US$140.00. — Marcel Dekker, New York, 1997.

This reference/text focuses on classical problems in graph theory, including the 5-flow and 4-flow conjectures, the edge-3-coloring conjecture, the 3-flow conjecture, and cycle double cover conjecture. Concentrating on graph theoretical methods and results, the book highlights the interrelationships between graph coloring, integer flow, cycle covers, and graph minors... discusses the fundamental properties and equivalent versions of integer flows, etc.

Åke Björck. — **Numerical methods for least squares problems.** — Un vol. broché, 18×25, de xvii, 408 p. — Prix: US$47.50. — Society for Industrial and Applied Mathematics, Philadelphia, 1996.

Tremendous progress has been made in numerical methods for least squares problems, in particular for generalized and modified least squares problems and direct and iterative methods for sparse problems. Until now there has not been a monograph that covers the full spectrum of relevant problems and methods in least squares. This volume gives an in-depth treatment of

topics such as methods for sparse least squares problems, iterative methods, modified least squares, weighted problems, and constrained and regularized problems. The more than 800 references provide a comprehensive survey of the available literature on the subject.

Cornelius LANCZOS. — **Linear differential operators.** — Classics in applied mathematics, vol. 18. — Un vol. broché, 15×23, de XVII, 564 p. — Prix: US$49.50. — Society for Industrial and Applied Mathematics, Philadelphia, 1996.

Originally published in 1961, this Classics edition continues to be appealing because it describes a large number of techniques still useful today. Lanczos begins with three introductory chapters that explore some of the technical tools needed later in the book, and then goes on to discuss interpolation, harmonic analysis, matrix calculus, the concept of the function space, boundary value problems, and the numerical solution of trajectory problems. The emphasis is constantly on the question: "What are the basic and characteristic properties of linear differential operators?"

Robert T. GLASSEY. — **The Cauchy problem in kinetic theory.** — Un vol. broché, 18×25,5, de XII, 241 p. — Prix: US$40.00. — Society for Industrial and Applied Mathematics, Philadelphia, 1996.

This volume contains up-to-date, state-of-the-art treatments of initial-value problems for the major kinetic equations, including the Boltzmann equation and the Vlasov-Poisson/ Vlasov-Maxwell systems. The author proves that solutions starting from a given configuration at an initial time exist for all future times by imposing appropriate hypotheses on the initial values in several important cases. He emphasizes those questions that a mathematician would ask first: Is there a solution to this problem? Is it unique? Can it be numerically approximated?

Walter RUDIN. — **The way I remember it.** — History of mathematics, vol. 12. — Un vol. relié, 18,5×26,5, de IX, 191 p. — Prix: £22.00. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Oxford, 1997.

Walter Rudin's memoirs should prove to be a delightful read specifically to mathematicians, but also to historians who are interested in learning about his colorful history and ancestry. Rudin presents in the first part of the book his early memories about his family history, his boyhood in Vienna throughout the 1920s and 1930s, and his experiences during World War II. Part II offers samples of his work, in which he relates where problems came from, what their solutions led to, and who else was involved.

S.T. ZAVALISHCHIN, A.N. SESEKIN. — **Dynamic impulse systems: theory and applications.** — Mathematics and its applications, vol. 394. — Un vol. relié, 18,5×25, de XI, 256 p. — Prix: Dfl. 210.00. — Kluwer Academic Publishers, Dordrecht, 1997.

This book provides a general and systematic treatment of dynamic systems. Based on up-to-date mathematical methods, including distribution theory, it demonstrates the power of these methods in solving dynamics of systems and applied control problems. First, new approaches to the construction problem of the general theory of linear dynamic systems are suggested. Then a new theory of differential equations with nonlinear operations over impulse input actions is developed. Finally, some singular optimization problems are treated on the subject of the mechanics of space flight, the motion transport manipulators in a viscous medium, quantum physics and economics.

Ordered algebraic structures. — Proceedings of the Curaçao Conference, sponsored by the Caribbean Mathematics Foundation, June 26-30, 1995. — Edited by W. Charles Holland

and Jorge Martinez. — Un vol. relié, 17×25, de IX, 332 p. — Prix: Dfl. 245.00. — Kluwer Academic Publishers, Dordrecht, 1997.

This book provides a sampling of recent advances in ordered algebraic structures, with emphasis on developments in areas where general topology, category theory and model theory play a prominent role. The discourse in ordered algebra has been significantly affected by other disciplines, and this volume is representative of that trend.

Operations research and discrete analysis. — Edited by Aleksei D. Korshunov. — Mathematics and its applications, vol. 391. — Un vol. relié, 17×25, de VI, 331 p. — Prix: Dfl. 270.00. — Kluwer Academic Publishers, Dordrecht, 1997.

The contributions to this volume have all been translated from the second volume of the Russian journal *Discrete Analysis and Operational Research*, published at the Sobolev Institute of Mathematics, Novosibirsk, Russia, in 1995. The papers collected here give an excellent overview of recent Russian research in topics such as analysis of algorithms, combinatorics, coding theory, graphs, lower bounds for complexity of Boolean functions and scheduling theory, and can be seen as an update of the book *Discrete Analysis and Operational Research*, published by Kluwer in 1996.

W.D. WALLIS. — **One-factorizations.** — Mathematics and its applications, vol. 390. — Un vol. relié, 17×25, de XIV, 242 p. — Prix: Dfl. 220.00. — Kluwer Academic Publishers, Dordrecht, 1997.

This is a specialized textbook on graph factorizations, an area which lies partly in graph theory and partly in the theory of combinatorial designs. It is the first full-size book on its particular subject, which has previously been treated only in survey papers and in chapters in books on design theory and on graph decompositions and matching theory. This book is intended for beginning graduate students in Combinatorial Mathematics, and may be used as a text for a special topics course; but it reaches to the boundaries of current research and will also prove useful as a reference source for professionals in the field.

C.T.J. DODSON, Philip E. PARKER. — **A user's guide to algebraic topology.** — Mathematics and its applications, vol. 387. — Un vol. relié, 17×25, de XII, 405 p. — Prix: Dfl. 320.00. — Kluwer Academic Publishers, Dordrecht, 1997.

The authors start gently, with numerous pictures to illustrate the fundamental ideas and constructions in homotopy theory that are needed in later chapters. They show how to calculate homotopy groups, homology groups and cohomology rings of most of the major theories, exact homotopy sequences of fibrations, important spectral sequences, and all the obstructions that we can compute from these. Their approach is to mix illustrative examples with those proofs that actually develop transferable calculational aids. They give extensive tables of data and appendices with revision notes on prerequisite topics.

R. SCHOEN, S.T. YAU. — **Lectures on harmonic maps.** — Conference proceedings and lecture notes in geometry and topology, vol. 2. — Un vol. relié, 19×26, de 394 p. — International Press, Boston, 1997.

Part I of the book is devoted to harmonic maps defined on Riemann surfaces. While the authors include topics that they find interesting, they do omit a lot of important developments. Most notable is the subject of harmonic maps as exactly solvable model. In the first two chapters of Part 2, the authors report on regularity theory even when the target space need not be a nice manifold. In this setting, it was developed by the first author, and jointly with

N. Korevaar later. In the early seventies, the first author realized that the theorem of Eells and Sampson could be used to reprove the famous rigidity theorem of Mostow and superrigidity theory of Margulis. Both authors had already succeeded in applying the theory of harmonic maps to study topology of manifolds of negative curvature; these works are reported in Part II.

Igor NOVIKOV, Evgenij SEMENOV. — **Haar series and linear operators.** — Mathematics and its applications, vol. 367. — Un vol. relié, 17×25, de xv, 218 p. — Prix: Dfl. 175.00. — Kluwer Academic Publishers, Dordrecht, 1997.

This volume is devoted to the investigation of the Haar system from the operator theory point of view. The main subjects treated are: classical results on unconditional convergence of the Haar series in modern presentation; Fourier-Haar coefficients; reproducibility; martingales; monotone bases in rearrangement invariant spaces; rearrangements and multipliers with respect to the Haar system; subspaces generated by subsequences of the Haar system; the criterion of equivalence of the Haar and Franklin systems.