BULLETIN BIBLIOGRAPHIQUE

Jean-Pierre CHANGEUX, Alain CONNES. — **Conversations on mind, matter, and mathematics.** — Edited and translated by M.B. DeBevoise. — Un vol. relié, 15×22,5, de xii, 260 p. — Prix: US$24.95. — Princeton University Press, Princeton NJ, 1995.

The problematic status of mathematical objects leads the authors to discuss the organization and function of the brain, the ways in which its embryonic and post-natal development influences mathematical reasoning and other kinds of thinking, and whether human intelligence can be simulated, modeled, or actually reproduced by mechanical means. Why order should exist in the world at all, and why it should be comprehensible to human beings, is the question that lies at the heart of these remarkable dialogues between J.-P. Changeux, neurobiologist, and A. Connes.

Progress in partial differential equations: the Metz surveys 3. — Edited by M. Chipot, J. Saint Jean Paulin, and I. Shafrir. — Pitman research notes in mathematics series, vol. 314. — Un vol. broché, 17×24,5, de 231 p. — Prix: £27.00. — Longman Scientific & Technical, Harlow, Essex, 1994.

This volume presents some recent advances in various important domains of partial differential equations and applied mathematics including harmonic maps, Ginzburg-Landau energy, liquid crystals, superconductivity, homogenization and oscillations, dynamical systems and inertial manifolds. The book should interest not only experts in partial differential equations but also graduate students, applied mathematicians and computer users.

Topological vector spaces, algebras and related areas. — Edited by Anthony To-Ming Lau and Ian Tweddle. — Pitman research notes in mathematics series, vol. 316. — Un vol. broché, 17×24,5, de 268 p. — Prix: £32.00. — Longman Scientific & Technical, Harlow, Essex, 1994.

This volume contains the proceedings of an International Conference held to mark the retirement of professor Taqdir Husain from McMaster University, Hamilton, Ontario, Canada. The topics - topological algebras and related areas - represent Husain's research interests and many of the authors have been associated with him as graduate students, poostdoctoral fellows or research collaborators. The articles present surveys and new research in the topics of the conference.

Michael R. DARNEL. — **Theory of lattice-ordered groups.** — Pure and applied mathematics, vol. 187. — Un vol. broché, 16×23,5, de vii, 539 p. — Prix: US$165.00. — Marcel Dekker, New York, 1995.

Beginning with the most general concepts common to all *l*-groups, this volume offers a new presentation of the theory of varieties of *l*-groups...examines the problem of defining algebraic operations on a lattice...presents novel techniques to construct extensions of one *l*-group by means of another...investigates the use of disjoint conjugate chains to study varieties of *l*-groups, etc.

L.H. ERBE, Qingkai KONG, B.G. ZHANG. — **Oscillation theory for functional differential equations.** — Pure and applied mathematics, vol. 190. — Un vol. relié, 16×23,5, de VII, 482 p. — Prix: US$185.00. — Marcel Dekker, New York, 1995.

Showing how to extend the techniques for boundary value problems of ordinary differential equations to those of functional differential equations, this reference explores in detail important topics such as the existence of oscillatory solutions...estimates of the distance between zeros... asymptotic classification of nonoscillatory solutions and criteria for certain types of nonoscillatory solutions...the oscillation of equations with nonlinear neutral terms and the oscillation of systems of equations, etc.

Lawrence J. CORWIN, Robert H. SZCZARBA. — **Calculus in vector spaces.** — Second edition. — Pure and applied mathematics, vol. 189. — Un vol. relié, 16× 24, de XI, 583 p. — Prix: US$165.00. — Marcel Dekker, New York, 1995.

Demonstrating that mathematics is a noncompartmentalized discipline of interrelated subjects, this thoroughly revised second edition introduces the derivative as a linear transformation...presents linear algebra in a concrete context based on complementary ideas in calculus...explains differential forms on Euclidean space permitting Green's theorem, Gauss's theorem, and Stokes's thorem to be understood in a natural setting... gives a new clarification of compactness as defined in terms of coverings and in terms of sequences...supplies a novel treatment of eigenvalues and eigenvectors, etc.

Anthony N. MICHEL, Kaining WANG. — **Qualitative theory of dynamical systems: the role of stability preserving mappings.** — Pure and applied mathematics, vol. 186. — Un vol. relié, 16×23, de X, 450 p. — Prix: US$135.00. — Marcel Dekker, New York, 1995.

Providing insight into dynamical systems unobtainable by usual treatments of the subject, this volume presents the principal Lyapunov stability results for general dynamical systems...develops a comparison theory for the qualitative analysis of general dynamical systems...shows how the general results obtained can be specialized to establish a qualitative theory for dynamical systems determined by equations, inequalities, and inclusions, etc.

Zero-dimensional commutative rings. — Proceedings of the 1994 John H. Barrett Memorial Lectures and Conference on Commutative Ring Theory. — Edited by David F. Anderson, David E. Dobbs. — Lecture notes in pure and applied mathematics, vol. 171. — Un vol. broché, 18×25, de XI, 378 p. — Prix: US$165.00. — Marcel Dekker, New York, 1995.

This reference book presents the latest advances in zero-dimensional commutative-rings and commutative algebra. Examining wide-ranging developments in commutative ring theory, this reference covers von Neumann regular rings...integrality, prime ideals, and chain conditions...integral domains, integer-valued polynomials, and factorization...dimension theories, pullbacks, direct limits, and deformations, etc.

Marjorie SENECHAL. — **Quasicrystals and geometry.** — Un vol. relié, 16×23,5, de XV, 286 p. — Prix: £40.00. — Cambridge University Press, Cambridge, 1995.

The book brings together for the first time the many strands of contemporary research in quasicrystal geometry and weaves them into a coherent whole. The author describes the historical and scientific context of this work, and explains what has been proved and what is conjectured. By demonstrating that "order" need not be synonymous with periodicity, it raised the question of what we mean by "order", and how orderliness in a geometric structure is reflected in measures of order such as diffraction spectra.

G. Fayolle, V.A. Malyshev, M.V. Menshikov. — **Topics in the constructive theory of countable Markov chains.** — Un vol. relié, 15,5×23,5, de 169 p. — Prix: £27.95. — Cambridge University Press, Cambridge, 1995.

The main point of the present book is to provide methods, based on construction of Lyapunov functions, of determining when a Markov chain is ergodic, null recurrent or transient. These methods, which are on the whole original and new, can also be extended to the study of questions of stability. Of particular concern are reflected random walks and reflected Brownian motion.

Stephen J. Gardiner. — **Harmonic approximation.** — London Mathematical Society lecture note series, vol. 221. — Un vol. broché, 15×23, de xiii, 132 p. — Prix: £19.95. — Cambridge University Press, Cambridge, 1995.

This is is the first book to give a systematic account on the subject of harmonic approximation, beginning with classical results concerning uniform approximation on compact sets, and progressing through fusion techniques to deal with approximation on unbounded sets. All the time, inspiration is drawn from results concerning holomorphic approximation such as the well known theorems of Runge and Mergelyan.

Number theory: Séminaire de théorie des nombres de Paris, 1992-3. — Edited by Sinnou David. — London Mathematical Society lecture note series, vol. 215. — Un vol. broché, 15×23, de viii, 291 p. — Prix: £24.95. — Cambridge University Press, Cambridge, 1995.

This is the 14th annual volume of the Séminaire. As with previous volumes the whole spectrum of number theory is discussed, with many contributions from some of the world's leading figures in this area. The very latest research developments are covered and much of the work presented here will not be found elsewhere. Also included are surveys that will serve to guide the reader through the extensive published literature.

Fernando Q. Gouvéa, Noriko Yui. — **Arithmetic of diagonal hypersurfaces over finite fields.** — London Mathematical Society lecture note series, vol. 209. — Un vol. broché, 15×23, de xi, 169 p. — Prix: £19.95. — Cambridge University Press, Cambridge, 1995.

This book is concerned with the arithmetic of diagonal hypersurfaces over finite fields, with special focus on the Tate conjecture and the Lichtenbaum-Milne formula for the central value of the L-function. It combines theoretical and numerical work, and includes tables of Picard numbers. Although this book is aimed at experts, the authors have included some background material to help non-specialists gain access to the results.

Dmitri N. Akhiezer. — **Lie group actions in complex analysis.** — Aspects of mathematics, vol. E27. — Un vol. relié, 16,5×23, de vii, 201 p. — Prix: DM 68.00. — Vieweg, Wiesbaden, 1995.

The main topic of this book is the study of the interaction between the theory of Lie groups and complex analysis. More specifically, the author concentrates on the double role of Lie groups in complex analysis, namely, as groups of biholomorphic selfmaps of certain complex analytic objects on the one hand and as a special class of complex manifolds with an additional strong structure on the other hand.

Serge Alinhac. — **Blowup for nonlinear hyperbolic equations.** — Progress in nonlinear differential equations and their applications, vol. 17. — Un vol. relié, 16×24, de xiv, 112 p. — Prix: SFr. 78.00. — Birkhäuser, Boston, 1995.

This book deals with classical solutions of global Cauchy problems for hyperbolic equations or systems. The approach is based on the display and study of two local blowup mechanisms, which the author calls the "Ordinary differential equation mechanism" and the "Geometric blowup mechanism". It introduces, via energy methods, the concept of lifespan, related to the nonlinear propagation of regularity (from the past to the future).

Herbert AMANN. — **Linear and quasilinear parabolic problems, vol I: Abstract linear theory.** — Monographs in mathematics, vol. 89. — Un vol. relié, 17×24, de XXXV, 335 p. — Prix: SFr. 128.00. — Birkhäuser, Basel, 1995.

The treatise gives an exposition of the functional analytical approach to quasilinear parabolic evolution equations. This first volume is devoted to a detailed study of nonautonomous linear parabolic evolution equations in general Banach spaces. — Contents: Generators and interpolation. Cauchy problems and evolution operators. Maximal regularity. Variable domains. Scales of Banach spaces.

Geometric aspects of functional analysis. — Israel Seminar (GAFA) 1992-94. — Edited by J. Lindenstrauss, V. Milman. — Operator theory, vol. 77. — Un vol. relié, 17×24, de IX, 337 p. — Prix: SFr. 128.00. — Birkhäuser, Basel, 1995.

This volume contains a collection of original research papers on recent developments in Banach space theory and related areas by many of the leading research workers in the field. A considerable number of papers are devoted to structure theory of infinite-dimensional Banach spaces. Other contributions concern the well established local theory of Banach spaces and its fruitful connection with classical convexity in $\mathbf{R}^n$.

V.I. ARNOLD. — **Topological invariants of plane curves and caustics.** — Dean Jacqueline B. Lewis Memorial lectures. — University lecture series, vol. 5. — Un vol. broché, 18×25,5, de VII, 60 p. — Prix: £17.50. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Corby, U.K., 1994.

Invariants and discriminants of plane curves: Plane curves. Legendrian knots. — Sympletic and contact topology of caustics and wave fronts, and Sturm theory: Singularities of caustics and Sturm theory. Singularities of wave fronts and the tennis ball theorem.

Mathematical quantum theory I: field theory and many-body theory. — Edited by J. Feldman, R. Froese, L.M. Rosen. — CRM Proceedings & lecture notes, vol. 7. — Un vol. broché, 18×25, de VII, 234 p. — Prix: £57.00. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Corby, U.K., 1995.

The articles in this book constitute the proceedings of the Canadian Mathematical Society Annual Seminar on Mathematical Quantum Theory held in Vancouver, August 4-14, 1993. The meeting was run as a research level summer school. The subject for the first session was quantum field theory and many-body theory and is covered in this first volume of these proceedings.

Mathematical quantum theory II: Schrödinger operators. — Edited by J. Feldman, R. Froese, L.M. Rosen. — CRM Proceedings & lecture notes, vol. 8. — Un vol. broché, 18×25, de VII, 304 p. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Corby, U.K., 1995.

The articles in this collection constitute the proceedings of the Canadian Mathematical Society Annual Seminar on Mathematical Quantum Theory held in Vancouver, August 4-14,

1993. The meeting featured a series of four-hour mini-courses, designed to introduce students to the state of the art in particular areas, and thirty hour-long expository lectures with contributions from some of the top experts in the field.

Helmut BENDER, George GLAUBERMAN, with the assistance of Walter CARLIP. — **Local analysis for the odd order theorem.** — London Mathematical Society lecture note series, vol. 188. — Un vol. broché, 15×23, de XI, 174 p. — Prix: £19.95. — Cambridge University Press, Cambridge, 1995.

Local analysis is the study of the centralizers and normalizers of non-identity *p*-subgroups, with Sylow's theorem as the first main tool. The main purpose of the book is to present a new version of the local analysis of the Feit-Thompson theorem. It includes a recent (1991) significant improvement by Feit and Thompson and a short revision by T. Peterfalvi of the separate final section of the second half of the proof.

Anthony W. KNAPP, David A. VOGAN, Jr. — **Cohomological induction and unitary representations.** — Princeton mathematical series, vol. 45. — Un vol. relié, 16×24, de XVII, 948 p. — Prix: US$69.50. — Princeton University Press, Princeton, N.J., 1995.

This book offers a systematic treatment of the development and use of cohomological induction to construct unitary representations. The book, which is accessible to students beyond the first year of graduate school, will interest mathematicians and physicists who want to learn about and take advantage of the algebraic side of representation theory of Lie groups. The book develops the necessary background in representation theory and includes an introductory chapter of motivation, a thorough treatment of the "translation principle", and four appendices on algebra and analysis.

Rudy RUCKER. — **Infinity and the mind: the science and philosophy of the infinite.** — Princeton science library. — Un vol. broché, 15,5×23, de XII, 342 p. — Prix: US$12.95. — Princeton University Press, Princeton, N.J., 1995.

Using cartoons, puzzles, and quotations to enliven his text, the author guides us through the paradoxes of set theory, the possibilities of physical infinities, and the results of Gödel's incompleteness theorems. His personal encounters with Gödel, provide a rare glimpse at genius and reveal the transcendent implications of Platonic realism.

Larry SMITH. — **Polynomial invariants of finite groups.** — Research notes in mathematics, vol. 6. — Un vol. relié, 16×23, de XIV, 359 p. — Prix: US$59.95. — A.K. Peters, Wellesley, Mass., 1995.

This book represents the compilation of the most essential and interesting results in the theory of polynomial invariants of finite groups. It also introduces some of the basic concepts of ideal theory and homological algebra in their original context and discusses the mutual impact of invariant theory and algebraic topology. Along the way, the author examines such topics as the Hilbert-Noether finiteness theorems, methods for constructing invariants, the Poincaré series, localization and use of gradings, groups generated by pseudoreflections and their invariant theory, the Hilbert Syzygy Theorem, etc.

Barrett O'NEILL. — **The geometry of Kerr black holes.** — Un vol. relié, 16 ×24, de XVII, 381 p. — Prix: US$79.95. — A.K. Peters, Wellesley, Mass., 1995.

This book is a detailed study of the global geometry of Kerr spacetime - the relativistic model of the gravitational field of a rotating central mass. Here, O'Neill investigates geometric properties such as the curvature, geodesics, isometries, totally geodesic submanifolds, and

topological structure - emphasizing the physical interpretations - and relativistic concepts such as causality, Petrov type, optical scalars, and the Goldberg-Sachs theorem.

Helmuth SPÄTH. — **One dimensional spline interpolation algorithms.** — Un vol. relié, 15,5×23,5, de x, 404 p. — Prix: US$59.95. — A.K. Peters, Wellesley, Mass., 1995.

This volume presents a practical introduction to computing one dimensional spline functions and takes the elementary and directly applicable approach of using explicit and easily evaluated forms of the spline interpolants. Späth elegantly outlines the conditions under which one dimensional splines can be best applied and integrates into his detailed presentation numerous formulas and algorithms to emphasize his concepts.

Helmuth SPÄTH. — **Two dimensional spline interpolation.** — Un vol. relié, 16 ×24, de VIII, 304 p. — Prix: US$59.95. — A.K. Peters, Wellesley MA, 1995.

This volume presents a practical introduction to computing two dimensional spline functions and takes the elementary and directly applicable approach of using explicit and easily evaluated forms of the spline interpolants. The author outlines the conditions under which two dimensional splines can be best applied and integrates into his detailed presentation numerous formulas and algorithms to emphasize his concepts.

S. ZAIDMAN. — **Topics in abstract differential equations II.** — Pitman research notes in mathematics series, vol. 321. — Un vol. broché, 17×24,5, de 163 p. — Prix: £25.00. — Longman Scientific & Technical, Harlow, Essex, 1995.

Well-posed problems are studied in the context of the theory of operator groups and semi-groups as well as in the framework of time-dependent evolution equations; non well-posed problems are also considered. This volume presents a group of research topics including: almost periodic solutions, well-posed ultraweak Cauchy problems, regularity, regularization and uniqueness of ultraweak solutions, and lower bounds for abstract differential inequalities.

Harold M. EDWARDS. — **Linear algebra.** — Un vol. relié, 18,5×26, de XIII, 184 p. — Prix: SFr. 58.00. — Birkhäuser, Basel, 1995.

In this textbook, the author proposes a radically new and thoroughly algorithmic approach to linear algebra. Each proof is an algorithm described in English that can be translated into the computer language the class is using and put to work solving problems and generating new examples, making the study of linear algebra a truly interactive experience.

Howard ANTON. — **Calculus with analytic geometry.** — In collaboration with Albert Herr. — Fifth edition. — Un vol. relié, 22×26,5, de XXIX, 1094 p. — Prix: £24.50. — J. Wiley, New York, 1995.

This new edition incorporates the best features of calculus reform, yet preserves the main structure of an established and well-tested calculus course. The most salient changes are: material not included in the previous has been added: parametric representation of surfaces, Jacobians, conics in polar coordinates, integrals with respect to arc length, vector fields, Kepler's laws, and an appendix with basic material on complex variables. The multivariable calculus was completely rewritten. Each chapter ends with a set of exercises that are designed to be used with graphing calculators or computer algebra system.

Howard ANTON. — **Calculus: with analytic geometry.** — Fifth edition, brief edition. — In collaboration with Albert Herr. — Un vol. relié, 22,5×27, de XXXII, 682 p. — Prix: £21.95. — John Wiley, New York, 1995.

The goal for this edition is to create a contemporary text that incorporates the best features of calculus reform, yet preserves the main structure of an established and well-tested calculus course. Each chapter ends with a set of exercices that are designed to be solved using computer algebra systems or graphing calculators. The chapter on logarithms was completely rewritten. The authors assume in this edition more use of calculator computations in the exposition.

. Themistocles M. RASSIAS and Jaromír SIMSA. — **Finite sums decompositions in mathematical analysis.** — Pure and applied mathematics. — Un vol. relié, 16×23,5, de VI, 172 p. — Prix: £29.95. — J. Wiley, Chichester, 1995.

This book is the first to cover the classical results along with current research in a single unified source. Representations and approximations of functions in several variables are discussed, in terms of finite sums of products of factor functions in a lesser number of variables. One of the basic questions treated is closely connected with the thirteenth problem of David Hilbert, which concerns the solvability of algebraic equations.

Charles R. DOERING and J.D. GIBBON. — **Applied analysis of the Navier-Stokes equations.** — Cambridge texts in applied mathematics. — Un vol. broché, 15,5×23, de XIII, 217 p. — Prix: £14.95 (relié: £40.00). — Cambridge University Press, Cambridge, 1995.

This book is an introductory presentation, physical and mathematical, of the Navier-Stokes equations, focusing on unresolved questions of the regularity of solutions in three spatial dimensions, and the relation of these issues to the physical phenomenon of turbulent fluid motion. Results and techniques from nonlinear functional analysis are introduced as needed.

Nikolai N. TARKHANOV. — **The Cauchy problem for solutions of elliptic equations.** — Mathematical topics, vol. 7. — Un vol. relié, 17,5×24,5, de 478 p. — Prix: DM 148.00. — Akademie Verlag, Berlin, 1995.

The study of the Cauchy problem for solutions of an elliptic equation is carried out in three directions: determining the degree of instability, which is connected with sharp theorems on approximation by solutions of an elliptic equation; finding solvability conditions, which is based on the development of Hilbert space methods in the Cauchy problem; and reconstructing solutions via their Cauchy data, which requires efficient ways of approximation.

Wilhelm KLINGENBERG. — **Riemannian geometry.** — De Gruyter studies in mathematics, vol. 1. — Un vol. relié, 17,5×24,5, de X, 396 p. — Prix: DM 158.00. — Walter de Gruyter, Berlin, 1982.

The main novelty of the second revised edition of this graduate-level textbook on global Riemanian geometry is the presentation of a complete proof of a recent outstanding result by Bangert and Franks on the existence of infinitely many closed geodesics for every Riemannian metric on the sphere.

A.A. SAMARSKII, V.A. GALAKTIONOV, S.P. KURDYUMOV, A.P. MIKHAILOV. — **Blow-up in quasilinear parabolic equations.** — Translated from the Russian by Michael Grinfeld. — De Gruyter expositions in mathematics, vol. 19. — Un vol. relié, 17,5×25, de XXI, 533 p. — Prix: DM 328.00. — Walter de Gruyter, Berlin, 1995.

Preliminary facts of the theory of second order quasilinear parabolic equations. — Some quasilinear parabolic equations. Self-similar solutions and their asymptotic stability. — Heat localization (inertia). — Nonlinear equation with a source. Blow-up regimes. Localization.

Asymptotic behaviour of solutions. — Method of generalized comparison of solutions of different nonlinear parabolic equations and their applications. — Approximate self-similar solutions of nonlinear heat equations and their applications in the study of the localization effect. — Some other methods of study of unbounded solutions.

Asymptotic methods for elastic structures. — Proceedings of the International Conference, Lisbon, Portugal, October 4-8, 1993. — Edited by Philippe G. Ciarlet, Luis Trabucho, Juan M. Viano. — Un vol. relié, 17,5×24,5, de 291 p. — Prix: DM 248.00. — Walter de Gruyter, Berlin, 1995.

These proceedings contain 21 contributions from experts in applied mathematics and numerical analysis, which are based on lectures delivered at the conference. The subject is the asymptotic analysis of lower dimensional models used in elastic structures which are characterised from the geometric point of view by a small parameter, such as the thickness in plates and shells or the cross sectional area in rods. Particular emphasis is put on the junctions between such structural models.

Anatole KATOK, Boris HASSELBLATT. — **Introduction to the modern theory of dynamical systems.** — Encyclopedia of mathematics and its applications, vol. 54. — Un vol. relié, 16×24,5, de XVIII, 802 p. — Prix: £60.00. — Cambridge University Press, Cambridge, 1995.

The book begins with a 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 in depth the theories of low-dimensional dynamical systems and hyperbolic dynamical systems.

Acta numerica 1995. — Edited by A. Iserles. — Un vol. relié, 18×25, de 491 p. — Prix: £35.00. — Cambridge University Press, Cambridge, 1955.

Acta Numerica is an annual publication containing invited survey papers by leading researchers in a number of areas. — Contents: P.T. Boggs: Sequential quadratic programming. — C. Brezinski and J. Van Isegbem: A taste of Padé approximation. — K. Eriksson, D. Estep, P. Hansbo and C. Johnson: Introduction to adaptive methods for differential equations. — R. Glowinski and J.L. Lions: Exact and approximate controllability for distributed parameter systems. — T.Y. Hou: Numerical solutions for free boundary problems. — H. Neunzert and J. Struckmeier: Particle methods for the Boltzmann equation. — B.N. Parlett: The new qd algorithms.

Surveys in combinatorics, 1995. Edited by Peter Rowlinson. — London Mathematical Society lecture note series, vol. 218. — Un vol. broché, 15×23, de 231 p. — Prix: £22.95. — Cambridge University Press, Cambridge, 1995.

The fifteenth British Combinatorial Conference took place in July 1995 at the University of Stirling. This volume consists of the papers presented by the invited lecturers at the meeting, and provides an up-to-date survey of current research activity in several areas of combinatorics and its applications. These include distance-regular graphs, combinatorial designs, coding theory, spectra of graphs, and randomness and computation.

Stochastic partial differential equations. — Edited by Alison Etheridge. — London Mathematical Society lecture note series, vol. 216. — Un vol. broché, 15×23, de VI, 337 p. — Prix: £24.95. — Cambridge University Press, Cambridge, 1995.

This book consists of papers given at the ICMS Edinburgh Meeting in 1994 on stochastic partial differential equations, and it brings together some of the world's best known authorities on this topic. Subjects covered include the stochastic Navier-Stokes equation, critical branching systems, population models, statistical dynamics, and ergodic properties of Markov semigroups.

Micha SHARIR, Pankaj K. AGARWAL. — **Davenport-Schinzel sequences and their geometric applications.** — Un vol. relié, 16×24, de XII, 372 p. — Prix: £35.00. — Cambridge University Press, Cambridge, 1995.

Davenport-Schinzel sequences contain no pair of equal adjacent elements, and no alternating subsequence of specified length. These sequences arise in the analysis of the combinatorial complexity of the lower envelope of univariate functions, and are therefore a basic and important construct in many geometric applications, both combinatorial and algorithmic. They possess the surprising property that their maximum length is almost linear in the number of symbols. This book presents a comprehensive treatment of these sequences and their geometric applications.

John McCLEARY. — **Geometry from a differentiable viewpoint.** — Un vol. broché, 18×25,5, de XII, 308 p. — Prix: £32.50. — Cambridge University Press, Cambridge, 1995.

The author considers the historical development of non-Euclidean geometry, placing differential geometry in the context of the synthetic geometry students will recognize from high school. The text serves as both an introduction to the classical differential geometry of curves and surfaces and as a history of a particular surface, the non-Euclidean or hyperbolic plane. Interesting diversions are offered, such as Huygens's pendulum clock and mathematical cartography.

Kurt GOEDEL. — **Collected works, vol. III: Unpublished essays and lectures.** — Edited by Solomon Feferman, John W. Dawson, Jr., Warren Goldfarb, Charles Parsons, Robert M. Solovay. — Un vol. relié, 16,5×24, de XVII, 532 p. — Prix: £45.00. — Oxford University Press, New York, 1995.

This volume features a wide selection of unpublished articles and lecture texts found in Gödel's Nachlass, documents that enlarge considerably our appreciation of his scientific and philosophical thought and add a great deal to our understanding of his motivations. The present volume includes introductory notes that provide extensive explanatory and historical commentary on each of the papers, English translations of material originally written in German, and a complete bibliography.

Rolf-Peter HOLZAPFEL. — **The ball and some Hilbert problems.** — Lectures in mathematics ETH Zürich. — Un vol. broché, 17×24, de VI, 159 p. — Prix: SFr. 44.00. — Birkhäuser, Basel, 1995.

Elliptic curves, the finiteness theorem of Shafarevic. — Picard curves. — Uniformizations and differential equations of Euler-Picard type. — Algebraic values of Picard modular theta functions. — Transcendental values of Picard modular theta constants. — Arithmetic surfaces of Kodaira-Picard type and some Diophantine equations. — A finiteness theorem for Picard curves with good reduction. — The Hilbert problems 7, 12, 21 and 22.

Partial differential operators and mathematical physics. — International Conference in Holzhau, Germany, July 3-9, 1994. — Edited by M. Demuth, B.-W. Schulze. — Operator theory, vol. 78. — Un vol. relié, 17×24, de VII, 429 p. — Prix: SFr. 148.00. — Birkhäuser, Basel, 1995.

Topics of special interest at the conference and which now form the core of this volume are hyperbolic operators, spectral theory for elliptic operators, eta-invariant, singular configurations and asymptotics, Bergman-kernel, attractors of non-autonomous evolution equations, pseudo-differential boundary value problems, Mellin pseudo-differential operators, approximation and stability problems for elliptic operators, and operator determinants.

Y.M. BEREZANSKY and Y.G. KONDRATIEV. — **Spectral methods in infinite-dimensional analysis.** — Mathematical physics and applied mathematics, vol. 12. — Deux vol. reliés, de respectivement, XVII, 576 p. et VIII, 260 p. — Prix: Dfl. 795.00 l'ensemble. — Kluwer Academic Publishers, Dordrecht, 1995.

This major two-volume work is devoted to the methods of the spectral theory of operators and the important role they play in infinite-dimensional analysis and its applications. Central to this study is the theory of the expansion of general eigenfunctions for families of commuting self-adjoint or normal operators. This enables a consideration of commutative models which can be applied to the representation of various commutation relations. — Contents of vol. 1: Rigged spaces. Generalized functions of infinitely many variables. Gaussian measures. Spectral theory. Representations by commuting operators. — Contents of vol. 2: Application of the theory of expansions to the harmonic analysis. Infinite-dimensional elliptic differential operators of the second order. Infinite-dimensional differential operators in the models of quantum statistical physics and field theory.

Spectral analysis of complex structures. — E. Sanchez-Palencia, coordinateur. — Travaux en cours, vol. 49. — Un vol. broché, 17×4, de 184 p. — Prix: FF 180.00. Hermann, Paris, 1995.

This volume brings together the original contributions delivered at the Colloquium "Spectral analysis of complex structures" sponsored by the European Mechanics Council and the International Society for the Interaction of Mechanics and Mathematics, held at the Ministère de la recherche et de l'espace, Paris, on May 12-14, 1993. These contributions deal with the following main subjects: computing spectra of non-compact operators, thin elastic shells, coupling of shells and fluids, controlability, singular perturbations.

S. HAMER. — **Méthodologie de l'enseignement des mathématiques: un cas d'école, les primitives, analyse mathématique.** — Pédagogies et développement. Pratiques méthodologiques. — Un vol. broché, 16×24, de 120 p. — Prix: F.Belge 420.00. — De Boeck Université, Bruxelles, 1995, diffusé en France par les Ed. Belin, Paris, et en Suisse par GM Diffusion, Lonay.

Prenant prétexte de la théorie des primitives, ce livre présente une série de réflexions sur l'enseignement de l'analyse. Les difficultés rencontrées par l'enseignant de mathématique ont une origine profondément ancrée dans la discipline. Aussi la plus grande importance a-t-elle été accordée aux concepts décrivant des mises en situation que l'on peut exploiter dans des classes fortes ou faibles en mathématique.

Robert V. MOODY, Arturo PIANZOLA. — **Lie algebras with triangular decompositions.** — Canadian mathematical society series of monographs and advanced texts. — Un vol. relié, $16 \times 24,5$, de XX, 685 p. — Prix: £62.00. — John Wiley, New York, 1995.

Group theory has now entered almost every area of mathematics, and the Lie groups - those that permit infinitesimal motions - have turned out to be of fundamental significance in

numerous areas of maths and physics (including differential equations, differential geometry, algebraic geometry, quantum mechanics, particle physics, special functions, algebraic topology, combinatorics, and probability theory).

C.K. CHEUNG, John HARER. — **Multivariable calculus with Maple V (preliminary edition).** — Un vol. broché, 21,5×28, de XIV, 366 p. — Prix: £16.50. — John Wiley, New York, 1994.

This text presents a new version of the multivariable calculus curriculum which integrates the use of the computer - in particular, the mathematical software Maple V - into the learning process. With the help of this new technology, students can move quickly into the application of ideas to problem solving. The material presented here can be used as a supplement to a standard text or on its own.

Salas and Hille's Calculus: one variable. — Seventh edition revised by Garret J. Etgen. — Un vol. relié, 21,5×26, de XIX, 771 p. — Prix: £21.95. — John Wiley, New York, 1995.

This text is designed for a standard introductory single variable calculus sequence. Over 1300 new problems have been added to the seventh edition. Many changes have been made in organization of the following chapters: — Precalculus review. — Limits and continuity. — Differentiation and applications of the derivative. Integration and applications of the integral. — Transcendental functions. Techniques of integration. Conic sections, polar coordinates and parametric equations. Sequences and series.

Salas and Hille's Calculus: several variables. — Seventh edition revised by Garret J. Etgen. — Un vol. broché, 21×25,5, de XLVI, 1258 p. — Prix: £21.95. — John Wiley, New York, 1995.

The subject of this text is calculus, and the emphasis is on the three basic concepts: limit, derivative, and integral. Over 750 new problems have been added to the seventh edition. Many changes have been made in organisation and content of: Sequences and series (chapters 10 and 11), Multivariable calculus (chapters 12-17), Differential equations (chapter 18).

Calculus in context: the Five College Calculus Project. — James Callahan, David Cox, Kenneth Hoffman, Donal O'Shea, Harriet Pollatsek, Lester Senechal. — Un vol. relié, 20,5×26, de XXIV, 818 p. — Prix: £26.95. — W.H. Freemann, New York, 1995.

The curricular goals of this book are: Develop calculus in the context of scientific and mathematical questions. — Treat systems of differential equations as fundamental objects of study. — Construct and analyze mathematical models. — Use the method of successive approximations to define and solve problems. — Develop geometric visualization with hand-drawn and computer graphics. — Give numerical methods a more central role.

Jerry JOHNSON, Benny EVANS. — **Discovering calculus with DERIVE.** — Second edition. — Un vol. broché, 20,5×25,5, de X, 314 p. — Prix: £14.95. — John Wiley, New York, 1995.

This book was written as an enrichment supplement to an otherwise traditional calculus course. Its purpose is to help students use the DERIVE program as a tool to explore calculus beyond the level of rote calculations and template exercices by providing problems that are different from those one would normally expect to do with nothing but pencil and paper. The second edition concentrates on multi-step structured laboratory assignments.

Giuseppe BENFATTO and Giovanni GALLAVOTTI. — **Renormalization group.** — Physics notes, vol. 1. — Un vol. broché, 15,5×23,5, de VIII, 142 p. — Prix: US$35.00. — Princeton University Press, Princeton, 1995.

Scaling and self-similarity ideas and methods in theoretical physics have, in the last twenty-five years, coalesced into renormalization group methods. This book analyzes some applications: the critical-point theory in classical statistical mechanics, the scalar quantum field theories in two and three space-time dimensions, and Tomonaga's theory of the ground state of one-dimensional Fermi systems.

Reinhold REMMERT, Peter ULLRICH. — **Elementare Zahlentheorie.** — 2. korrigierte Auflage. — Grundstudium Mathematik. — Un vol. broché, 17×24, de 275 p. — Prix: SFr. 32.00. — Birkhäuser, Basel, 1995.

Dieses Buch beginnt mit der Primfaktorzerlegung und dem grössten gemeinsamen Nenner, zwei Begriffen, die aus dem Schulunterricht bekannt sind, die bei genauerer Betrachtung aber viel von ihrer Selbstverständlichkeit verlieren. Auch der theoretische Hintergrund des aus dem Alltag wohlvertrauten Dezimalsystems wird erörtert. Weitere behandelte Themen sind Kongruenzenrechnung, primitive Wurzeln und das Reziprozitätsgesetz für quadratische Reste.

Alexander M. KRASNOSEL'SKII. — **Asymptotics of nonlinearities and operator equations.** — Translated from the Russian by Mircea Martin. — Operator theory, vol. 76. — Un vol. relié, 17×24, de VIII, 278 p. — Prix: SFr. 138.00. — Birkhäuser, Basel, 1995.

New methods for solving classical problems in the theory of nonlinear operator equations (solvability, multiple solutions, bifurcations, nonlinear resonance, potential methods, etc.) are introduced and discussed. The general abstract theorems are illustrated by various applications to differential equations and boundary value problems. In particular, the problem on forced periodic oscillations is considered for equations arising in control theory.

Theoretical, experimental and numerical contributions to the mechanics of fluids and solids. — A collection of papers in honor of Paul M. Naghdi. — Edited by James Casey and Marcel J. Crochet. — ZAMP: Zeitschrift für angewandte Mathematik und Physik, special issue, vol. 46. — Un vol. relié, 17,5×24, de 848 p. — Prix: SFr. 378.00. — Birkhäuser, Basel, 1995.

This is a comprehensive and up-to-date collection of papers on the mechanics of fluids and solids by leading researchers. It encompasses theoretical, experimental and numerical work on a variety of topics, including nonlinear elasticity, plasticity, dynamics, water waves, and turbulence. The collection will be of interest to graduate students and researchers in all branches of continuum mechanics.

P.M. COHN. — **Skew fields: theory of general division rings.** — Encyclopedia of mathematics and its applications, vol. 57. — Un vol. vol. relié, 16,5×24, de XV, 500 p. — Prix: £55.00. — Cambridge University Press, Cambridge, 1995.

The axiomatic foundation and a precise description of the embedding problem are followed by an account of algebraic and topological construction methods; in particular, the author's general embedding theory is presented with full proofs, leading to the construction of skew fields. The powerful coproduct theorems of G.M. Bergman are proved here as well as the properties of the matrix reduction functor, a useful but little-known construction providing a source of examples and counter-examples. Numerous exercises test the reader's understanding.

Vyjayanthi CHARI, Andrew PRESSLEY. — **A guide to quantum groups.** — Un vol. broché, 15,5×22,5, de xv, 651 p. — Prix: £22.95 (relié: £60.00). — Cambridge University Press, Cambridge, 1994.

The goal of this book is to give a comprehensive view of quantum groups and their applications. The authors build on a self-contained account of the foundations of the subject and go on to treat the more advanced aspects concisely and with detailed references to the literature. Thus this book can serve both as an introduction for the newcomer, and as a guide for the more experienced reader.

Joe DIESTEL, Hans JARCHOW, Andrew TONGE. — **Absolutely summing operators.** — Cambridge studies in advanced mathematics, vol. 43. — Un vol relié, 23,5×15,5, de xv, 474 p. — Prix: £40.00. — Cambridge University Press, Cambridge, 1995.

Many fundamental processes in analysis are best understood by studying and comparing the summability of series in various modes of convergence. This text provides the beginning graduate student, one with a basic knowledge of real and functional analysis, wih an account of p-summing and related operators. The account is panoramic, with detailed expositions of the core results and highly non-trivial applications to, for example, harmonic analysis, probability and measure theory, and operator theory.

Ergodic theory and its connection with harmonic analysis. — Proceedings of the 1993 Alexandria Conference. — Edited by Karl E. Petersen and Ibrahim A. Salama. — London Mathematical Society lecture note series, vol. 205. — Un vol. broché, 15×23, de viii, 437 p. — Prix: £24.95. — Cambridge University Press, Cambridge, 1995.

The three survey papers in this book describe the relationships of almost everywhere convergence (J. Rosenblatt and M. Wierdl), rigidity theory (R. Spatzier), and the theory of joinings (J.-P. Thouvenot). These papers present the background of each area of interaction, the most outstanding recent results, and the currently promising lines of research. The book also includes 13 research papers that describe recent work related to the theme of the conference; several treat questions arising from the Furstenberg multiple recurrence theory, while the remainder discuss almost everywhere convergence and a variety of other topics in dynamics.

János KOLLÁR. — **Shafarevich maps and automorphic forms.** — M.P. Porter lectures. — Un vol. relié, 16×24,5, 199 p. — Prix: US$37.50. — Princeton University Press, Princeton, 1995.

The aim of this book is to study various geometric properties and algebraic invariants of smooth projective varieties with infinite fundamental groups. This approach allows for much interplay between methods of algebraic geometry, complex analysis, the theory of harmonic maps, and topology. Contents: Shafarevich maps. — Automorphic forms: classical theory. — Vanishing theorems. — Automorphic forms revisited. — Other applications.

Singularity theory: 19 August-6 September 1991. — Editors D.T. Lê, K. Saito, B. Teissier. — Un vol. relié, 16×22, de x, 982 p. — Prix: £111.00. — World Scientific, Singapore, 1995.

The aim of this large Symposium was to train mathematicians coming from developing countries and to present most of the different aspects of this area of mathematics. The book provides a survey of the different domains involving the theory of singularities. The main lectures contained in this volume are: Topology of complex singularities. — Groups and special singularities. — Introduction to curve singularities. — Classification and stability of smooth maps.

Introduction to differential and algebraic topology. — Yuri G. Borisovich, Nikolai M. Bliznyakov, Tatyana N. Fomenko and Yakov A. Izrailevich. — Kluwer texts in the mathematical sciences, vol. 9. — Un vol. relié, 16,5 × 24,5, de IX, 492 p. — Prix: Dfl. 365.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This book, which is a thoroughly revised, extensively rewritten, second edition of the work first published in Russian in 1980 is a primary manual of topology. It contains the basic concepts and theorems of general topology and homotopy theory, the classification of two-dimensional surfaces, an outline of smooth manifold theory and mapping of smooth manifolds. Elements of Morse and homology theory, with their application to fixed points, are included.

Real and complex dynamical systems. — Edited by Bodil Branner and Poul Hjorth. — NATO ASI series. Series C: Mathematical and physical sciences, vol. 464. — Un vol. relié, 16,5 × 24,5, de XVII, 344 p. — Prix: Dfl. 245.00. — Kluwer Acacemic Publishers, Dordrecht, 1995.

Problems in the real dynamical system area have been solved by using complex tools in the real or by extension to the complex. In return, problems in complex dynamical systems have been settled using results from the real area. The present volume examines the state of the art of central parts of both real and complex dynamical systems, reinforcing contact between the two aspects of the theory, making recent progress in each accessible to a larger group of mathematicians.

Computational algebra and number theory. — Edited by Wieb Bosma and Alf van der Poorten. — Mathematics and its applications, vol. 325. — Un vol. relié, 16,5 × 25, de XIV, 321 p. — Prix: Dfl. 220.00. — Kluwer, Dordrecht, 1995.

This book lies at the lively intersection of computer science and mathematics. It highlights the surprising width and depth of the field through examples drawn from current activity, ranging from category theory, graph theory and combinatorics, to more classical computational areas, such as group theory and number theory. Many of the papers in the book provide a survey of their topic, as well as a description of present research.

Studying links via closed braids. Number theory in function fields 1994. — Edited by S.H. Bae, G.T. Jin and K.H. Ko. — Lecture notes of the ninth KAIST Mathematics Workshop, vol. 1. — Un vol. broché, 18,5 × 25,5, de 123 p. — Korea Advanced Institute of Science and Technology Mathematics Research Center, Taejon, Korea, 1995.

The goal of this Workshop has been to introduce recent developments of the subject in the area concerned, thereby to enhance the research activities in Korea. Contents: J. Birman: Studying links via closed braids. — M. Rosen: Number theory in function fields.

Roger CARTER, Graeme SEGAL, Ian MACDONALD. — **Lectures on Lie groups and Lie algebras.** — London Mathematical Society student texts, vol. 32. — Un vol. broché, 15 × 23, de VI, 190 p. — Prix: £ 13.95 (Relié: £ 29.95). — Cambridge University Press, Cambridge, 1995.

In the first part Roger Carter outlines the main ideas involved in the structure and representation theory of simple Lie algebras. In the second part, Graeme Segal concentrates on the representation theory of Lie groups, and in the final part, Ian Macdonald presents an introduction to linear algebraic groups. Anybody requiring an introduction to this active area of mathematics should look no further than this book.

S.C. COUTINHO. — **A primer of algebraic D-modules.** — London Mathematical Society student texts, vol. 33. — Un vol. broché, 15 × 23, de XII, 207 p. — Prix: £ 13.95 (relié: £ 30.00). — Cambridge University Press, Cambridge, 1995.

This book introduces *D*-modules and their applications avoiding all unnecessary over-sophistication. It is aimed at beginning graduate students and the approach taken is algebraic, concentrating on the role of the Weyl algebra. Very few prerequisites are assumed, and the book is virtually self-contained. Exercises are included at the end of each chapter and the reader is given ample references to the more advanced literature.

Automorphisms of affine spaces. — Proceedings of a Conference held in Curaçao (Netherlands Antilles), July 4-8, 1994, under auspices of the Carribean Mathematical Foundation (CMF). — Edited by Arno Van Den Essen. — Un vol. relié., 16,5×24,5, de XIX, 243 p. — Prix: Dfl. 185.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This volume describes the latest results concerning several conjectures related to polynomial automorphisms. Conjectures discussed are: the Jacobian conjecture, the real Jacobian conjecture, the Markus-Yamabe conjecture, the linearization conjecture and the tame generators conjecture. Several contributions are of an expository nature, containing the latest results obtained by leaders in the field.

L. STUPELIS. — **Navier-Stokes equations in irregular domains.** — Mathematics and its applications, vol. 326. — Un vol. relié, 16,5×24,5, de XV, 566 p. — Prix: Dfl. 350.00. — Kluwer Academic Publishers, Dordrecht, 1995.

The analytical basis of the book is formed by coercive estimates, which enable proofs to be given of the solvability of the boundary value problems for Stokes and Navier-Stokes equations in weighted Sobolev and Hölder spaces, and the investigation of the smoothness of their solutions. This allows one to deal with the special problems that arise in the presence of edges or angular points in the plane case, at the boundary or noncompact boundaries.

V. KOVALENKO, N.E. FRENKEL, M.L. GLASER, T. TAUCHER. — **Generalised Euler-Jacobi inversion formula and asymptotics beyond all orders.** — London Mathematical Society lecture note series, vol. 214. — Un vol. broché, 15×23, de X, 129 p. — Prix: £19.95. — Cambridge University Press, Cambridge, 1995.

By considering special exponential series arising in number theory the authors derive the generalised Euler-Jacobi series, expressed in terms of hypergeometric series. Dingle's theory of terminants is then employed to show how the divergences in both dominant and subdominant series of a complete asymptotic expansion can be tamed. Numerical results are used to illustrate that a complete asymptotic expansion can be made to agree with exact results for the generalised Euler-Jacobi series to any desired degree of accuracy.

Kent HARRIS, Robert J. LOPEZ. — **Discovering calculus with MAPLE.** — Second edition. — Un vol. broché, 20,5×25,5, de 344 p. — Prix: £14.95. — John Wiley & Sons, New York, 1995.

This second edition has been extensively rewritten, reflecting numerous changes. The examples contain greater detail, show many new Maple feature, and expand the use of a computer algebra system in solving different types of problems. Most of the exercises are new or have been updated. Each chapter now includes, in addition to a collection of exercises, a set of projects. The structure is similar to that of most traditional calculus books.

Alexander L. ROSENBERG. — **Noncommutative algebraic geometry and representations of quantized algebras.** — Mathematics and its applications, vol. 330. — Un vol. relié, 16,5×25, de XII, 315 p. — Prix: Dfl. 210.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This book contains an introduction to the recently developed spectral theory of associative rings and Abelian categories, and its applications to the study of irreducible representations of classes of algebras which play an important part in modern mathematical physics. — Audience: A self-contained volume for researchers and graduate students interested in new geometric ideas in algebra, and in the spectral theory of noncommutative rings, currently invading mathematical physics.

Harmonic analysis in China. — Edited by Minde Cheng, Dong-gao Deng, Sheng Gong and Chung-Chun Yang. — Mathematics and its applications, vol. 327. — Un vol. relié, 16,5×25, de X, 307 p. — Prix: Dfl. 220.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This book is a collection of surveys and research papers written by Chinese mathematicians. It covers topics in analytic function spaces of several complex variables, integral transforms, harmonic analysis on classical Lie groups and manifolds, Lp-estimates of the Cauchy-Riemann equations and wavelet transforms.

M.S. LIVSIC, N. KRAVITSKY, A.S. MARKUS, V. VINNIKOV. — **Theory of commuting non-selfadjoint operators.** — Mathematics and its applications, vol. 332. — Un vol. relié, 16,5×25, de XVI, 313 p. — Prix: Dfl. 235.00. — Kluwer Academic Publishers, Dordrecht, 1995.

This book presents a systematic and cogent exposition of results hitherto only available as research articles. A rigorous mathematical definition of the physical concept of a particle is proposed, and a concrete image of a particle conceived as a localised entity in space is obtained. The duality of waves and particles is explained as a simple consequence of general equations of collective motions. Connections with the theory of algebraic curves is also important.

Bernard GOSTIAUX. — **Cours de mathématiques spéciales, Tome 4: géométrie affine et métrique.** — Collection Mathématiques. — Un vol. broché, 15×22, de 231 p. — Prix: FF 198.00. — Presses universitaires de France, Paris, 1995.

Commentaire de l'auteur: «... cours donnant les définitions et propriétés de base des espaces affines, et permettant de retrouver des raisonnements rapides, intuitifs, propres à la géométrie pure, où les notions de barycentre, sous-espaces affines et convexité, reprennent leur place. L'utilisation de la topologie (et des structures euclidiennes) permet de traiter, par des raisonnements de passage à la limite, les cas particuliers qui étaient si fastidieux en géométrie euclidienne».

Bernard GOSTIAUX. — **Cours de mathématiques spéciales, Tome 5: géométrie, arc et nappes.** — Collection Mathématiques. — Un vol. broché, 15×22, de VII, 250 p. — Prix: FF 248.00. — Presses universitaires de France, Paris, 1995.

Les coniques et les quadriques, cas particuliers d'arcs et de nappes, trouvent leur place dans ce livre, et leur étude permet de voir comment on peut utiliser tous les outils dont on dispose pour parvenir à ses fins: structures affines, transformations géométriques, aussi bien que les formes quadratiques, ou les fonctions implicites.

Israel GOHBERG, Marinus A.KAASHOEK, Frederik van SCHAGEN. — **Partially specified matrices and operators: classification, completion, applications.** — Operator theory, advances and applications, vol. 79. — Un vol. relié, 17×24, de VIII, 333 p. — Prix: SFr. 148.00. — Birkhäuser, Basel, 1995.

This book explores a new direction in linear algebra and operator theory dealing with the invariants of partially specified matrices and operators, and with the spectral analysis

of their completions. A large part of the book deals with applications to matrix theory and analysis, namely to stabilization problems in mathematical system theory, to problems of Wiener-Hopf factorization and interpolation for matrix polynomials and rational matrix functions, to Kronecker structure theory of linear pencils, and to non-everywhere defined operators.

Alexander M. KYTMANOV. — **The Bochner-Martinelli integral and its applications.** — Translated from the Russian by Harold P. Boas. — Un vol. relié, 17×24, de XI, 305 p. — Prix: SFr.148.00. — Birkhäuser, Basel, 1995.

This monograph is devoted entirely to the Bochner-Martinelli integral representation for holomorphic functions in several complex variables. Considered are boundary values of the Bochner-Martinelli integral, the behaviour of the singular integral, jump theorems of the Bochner-Martinelli integral and its derivatives.

Werner BALLMANN. — **Lectures on spaces of nonpositive curvature.** — With an appendix by Misha Brin: Ergodicity of geodesic flows. — DMV Seminar, Bd. 25. — Un vol. broché, 17×24, de V, 112 p. — Prix: SFr. 34.00. — Birkhäuser, Basel, 1995.

Singular spaces with upper curvature bounds and, in particular, spaces of nonpositive curvature, have been of interest in many fields, including geometric (and combinatorial) group theory, topology, dynamical systems and probability theory. — Contents: Introduction. — On the interior geometry of metric spaces. — The boundary at infinity. — Weak hyperbolicity. — Rank rigidity. — Ergodicity of geodesic flows.

Peter J. OLVER. — **Equivalence, invariants and symmetry.** — Un vol. relié, 15,5×23,5, de XVI, 525 p. — Prix: £24.95. — Cambridge University Press, Cambridge, 1995.

This book presents an innovative synthesis of methods used to study problems of equivalence and symmetry which arise in a variety of mathematical fields and physical applications. Systematic and constructive methods for solving equivalence problems and calculating symmetries are developed and applied to a wide variety of mathematical systems, including differential equations, variational problems, manifolds, Riemannian metrics, polynomials, and differential operators.

Richard B. MELROSE. — **Geometric scattering theory.** — Stanford lectures. — Un vol. relié, 15,5×23,5, de XI, 116 p. — Prix: £25.00. — Cambridge University Press, Cambridge, 1995.

The simple and fundamental case of the Laplacian on Euclidean space is described in the first two lectures to introduce the basic framework of scattering theory. In the next three lectures various results on Euclidean scattering, and the methods used to prove them, are outlined. In the last three lectures these ideas are extended to non-Euclidean settings. These lecture notes will be of interest to researchers and graduate students in analysis and differential geometry.

Albrecht PFISTER. — **Quadratic forms with applications to algebraic geometry and topology.** — London Mathematical Society lecture notes series, vol. 217. — Un vol. broché, 15,5×22,5, de VI, 179 p. — Prix: £22.95. — Cambridge University Press, Cambridge, 1995.

The emphasis in these lecture notes is placed on results about quadratic forms that give rise to interconnections between number theory, algebra, algebraic geometry, and topology. Topics discussed include: Hilbert's 17th problem, the Tsen-Lang theory of quasi-algebraically closed

fields, the level of topological spaces and systems of quadratic forms over arbitrary fields. Whenever possible proofs are short and elegant, and the author's aim was to make this book as self contained as possible.

A. JOYAL, I. MOERDIJK. — **Algebraic set theory.** — London Mathematical Society lecture notes series, vol. 220. — Un vol. broché, 15,5×22,5, de VIII, 123 p. — Prix: £17.95. — Cambridge University Press, Cambridge, 1995.

This book offers a new, algebraic, approach to set theory. The authors introduce a particular kind of algebra, the Zermelo-Fraenkel algebras that arise from the familiar axioms of Zermelo-Fraenkel set theory. Furthermore, the authors actually explicitly construct such algebras using the theory of bisimulations. Their approach is completely constructive, and contains both intuitionistic set theory and topos theory. In particular it provides a uniform description of various constructions of the cumulative hierarchy of sets in forcing models, sheaf models and realizability models.

Wilfried GRECKSCH, Constantin TUDOR. — **Stochastic evolution equations: a Hilbert space approach.** — Mathematical research, vol. 85. — Un vol. broché, 17×24, de 178 p. — Prix: DM 78.00. — Akademie Verlag, Berlin, 1995.

The authors give a self-contained exposition of the theory of stochastic evolution equations. Elements of infinite dimensional analysis, martingale theory in Hilbert spaces, stochastic integrals, stochastic convolutions are applied. Existence and uniqueness theorems for stochastic evolution equations in Hilbert spaces in the sense of the semigroup theory, the theory of evolution operators, and monotonous operators in rigged Hilbert spaces are discussed. Relationships between the different concepts are demonstrated.

Ingo WITT. — **Non-linear hyperbolic equations in domains with conical points: existence and regularity of solutions.** — Mathematical research, vol. 84. — Un vol. broché, 17 ×24, de 230 p. — Prix: DM 98.00. — Akademie Verlag, Berlin, 1995.

These notes lead to a proof of a local-in-time existence result for quasilinear hyperbolic evolution equations of second order in domains with conical points. In the first part, the existence of solutions to the corresponding linear equations is discussed, including the asymptotics of solutions near conical points. Using this information, the quasilinear equations are then solved by the standard iteration procedure.

Ulrich BUNKE, Martin OLBRICH. — **Selberg zeta and theta functions: a differential operator approach.** — Mathematical research, vol. 83. — Un vol. broché, 17×24, de 168 p. — Prix: DM 78.00. — Akademie Verlag, Berlin, 1995.

The Selberg zeta and theta functions are studied using elliptic differential operators on bundles over locally symmetric spaces. The authors focus on the functional equations and the complete description of the singularities. Additional chapters are devoted to the theta function of Riemannian surfaces with cusps and to alternative descriptions of the singularities of the Selberg zeta function in terms of Lie algebra and group cohomology.

The Floer memorial volume. — Edited by Helmut Hofer, Clifford H. Taubes, Alan Weinstein, Eduard Zehnder. — Progress in mathematics, vol. 133. — Un vol. relié, 16×24, de XII, 685 p. — Prix: SFr. 118.00. — Birkhäuser , Basel, 1995.

The main interests of Andreas Floer were centered on the fields of dynamical systems, symplectic geometry, Yang-Mills theory and low dimensional topology. This volume opens with

a short biography and three hitherto unpublished papers of Andreas Floer. It then presents a collection of invited contributions, survey articles and research papers on his fields of interest, bearing testimony of the high esteem and appreciation this brilliant mathematician enjoyed among his colleagues.

Geometries in interaction. — GAFA special issue in honor of Mikhail Gromov. — Edited by Y. Eliashberg, V. Milman, L. Polterovich, R. Schoen. — Un vol. relié, 17×24, xvi, 527 p. — Prix: SFr. 68.00. — Birkhäuser, Basel, 1995.

This special issue, in honor of Mikhail Gromov contains 14 papers (originally published in Geometric and Functional Analysis vol. 5.2) which give a wide panorama of recent fundamental developments in modern geometry and its related subjects. The book is a collection of important results and an enduring source of new ideas for researchers and students in a broad spectrum of directions related to all aspects of geometry and its applications to functional analysis, PDE, analytic number theory and physics.

Philip J. Davis, Reuben Hersh, Elena Anne Marchisotto. — **The mathematical experience.** — With an introduction by Gian-Carlo Rota. — Study edition. — Un vol. relié, 16×24,5, de xxi, 487 p. — Prix: SFr. 68.00. — Birkhäuser, Boston, 1995.

The authors of this book believe that it should be possible for the professional mathematicians to explain to non-professionals what they do, what they say they are doing, and why the world should support them at it. They also believe that mathematics should be taught to non-mathematics majors in such a way as to instill an appreciation of the power and beauty of mathematics. Many people from around the world have encouraged publication of this revised edition complete with exercises for helping students to demonstrate their understanding.

N.Ya. Vilenkin. — **In search of infinity.** — Translated by Abe Shenitzer, with the editorial assistance of Hardy Grant and Stefan Mykytiuk. — Un vol. relié, 16×24,5, de 145 p. — Prix: Sfr 38.00. — Birkhäuser, Boston, 1995.

The author of this book presents a popular-level account of the roads followed by human thought in attempts to understand the idea of the infinite in mathematics and physics. In so doing, he brings to the general reader a deep insight into the nature of the problem. — Contents: Infinity and the universe. — The mysteries of infinite sets. — Remarkable functions and curves, or a stroll through a mathematical hall of wonders. — In search of the absolute.

Michael I. Gil'. — **Norm estimations for operator-valued functions and applications.** — Pure and applied mathematics, vol. 192. — Un vol. relié, 16×24, de viii, 355 p. — Prix: US$ 140.00. — Marcel Dekker, New York, 1995.

Demonstrating a novel approach to spectrum perturbations, this book considers a common procedure for the stability analysis of various classes of equations...extends the well-known spectrum perturbation result for self -adjoint operators to quasi-Hermitian operators...examines spectrum perturbations of operators on a tensor product of Hilbert spaces...covers systems of ordinary differential equations, etc.

Aggregating clones, colors, equations, iterates, numbers, and tiles. — Edited by Janos Aczél. — Un vol. broché, 17×24, de 213 p. — Prix: SFr. 42.00. — Birkhäuser Verlag, Basel, 1995.

This collection of invited survey papers celebrates the publication of the 50th volume of the journal "Aequationes mathematicae". — Contents: R.W. Quackenbush: A survey of minimal

clones. — Z. Moszner: General theory of the translation equation. — J. Aczél: Some recent applications of functional equations to the social and behavioral sciences. Further problems. — G. Targonski: Progress of iteration theory since 1981. — K. Ono, S. Robins, P.T. Wahl: On the representation of integers as sums of triangular numbers. — W.T. Tutte: Chromatic sums revisited. — L. Paganoni, J. Rätz: Conditional functional equations and orthogonal additivity. — G.L. Forti: Hyers-Ulam stability of functional equations in several variables. — A. Vince: Rep-tiling Euclidean space.

Victor P. SNAITH. — **Galois module structure.** — Fields Institute monographs, vol. 2. — Un vol. relié, 18×26, de VII, 207 p. — Prix: £29.50. — American Mathematical Society, Providence R.I., distributed by Oxford University Press, Corby, 1994.

The first published graduate course on the Chinburg conjectures, this book provides the necessary background in algebraic and analytic number theory, cohomology, representation theory, and Hom-descriptions. The computation of Hom-descriptions is facilitated by Snaith's Explicit Brauer Induction technique in representation theory. In this way, illustrative special cases of the main results and new examples of the conjectures are proved and amplified by numerous exercises and research problems.

Eugen V. SHIKIN. — **Handbook and atlas of curves.** — Un vol. relié, 16×24, de XIV, 545 p. — Prix: £59.95. — CRC Press, Boca Raton, distributed by Times Mirror International Publishers, 1995.

From the author's preface: "Two main considerations had to be taken into account during the preparation of the Handbook. First, it is the availability of the fundamental books containing a great body of data on plane curves... Second, it is the increasing use of personal computers possessing wide dynamic and graphic possibilities for the preparation of the new types of handbooks, computer handbooks. I have attempted to take a middle course between these two approaches by connecting the differentially geometric apparatus and computer-aided figures". Contents: Plane curves. — Atlas of plane curves. — Space curves. — Some applications of curves.

Jacques FARAUT and Adam KORANYI. — **Analysis on symmetric cones.** — Oxford mathematical monographs. — Oxford science publications. — Un vol. relié, 16×24, de XII, 382 p. — Prix: £50.00. — Clarendon Press, Oxford, 1994.

From the preface: "The purpose of this book is to give a self-contained exposition of the geometry of symmetric cones, and to develop analysis on these cones and on the complex tube domains associated with them. Our approach is based on the theory of Jordan algebras in the way worked out by M. Koecher and his school, since it leads relatively easily to explicit formulae and also to a classification of the symmetric cones. We develop in detail the Jordan algebra theory that is necessary for this purpose."

Current developments in mathematics, 1995. Edited by R. Bott, A. Jaffe, S.T. Yau, M. Hopkins, I. Singer, D. Stroock. — Sponsored by Harvard University and Massachusetts Institute of Technology. — Un vol. broché, 18×26, de II, 282 p. — International Press, Cambridge MA, 1995.

H. Darmon, F. Diamond, R. Taylor: Fermat's last theorem. — M. Lyubich: Renormalization ideas in conformal dynamics. — I. Madsen: Calculations in K-theory via traces. — C. McMullen: The classification of conformal dynamical systems. — G. Tian: Quantum cohomology and its associativity.

Martin GOLDSTERN, Haim JUDAH. — **The incompleteness phenomenon: a new course in mathematical logic.** — Un vol. relié, 16×23,5, de XIII, 247 p. — Prix: US$49.95. — A.K. Peters, Wellesley, Mass., 1995.

What is "the truth" ? Designed to be the foundation for a two semester course, this book delves into this, the most abstract branch of mathematical thought, mathematical logic. Separated from philosophical logic through the use of the mathematical method to investigate and explain, the basic phenomenon of mathematical logic is that every reasonable mathematical system is intrinsically incomplete. There will always be mathematical problems that we cannot solve. The authors provide exercises at the end of each section to supplement the abstract concepts.

Tomek BARTOSZYNSKI, Haim JUDAH. — **Set theory: on the structure of the real line.** — Un vol. relié, 16×23,5, de IX, 546 p. — Prix: US$69.95. — A.K. Peters, Wellesley, Mass., 1995.

This book reflects the current state of research in a major area of descriptive set theory. Its focus is measure and category in set theory, most notably on results dealing with asymmetry. The book consists of three interwoven parts: results that can be proven in Zermelo-Fraenkel set theory (and its extensions), independence results, and the "tools" used to accomplish both the aforementioned.

David J. ECK. — **The most complex machine: a survey of computers and computing.** — Un vol. relié, 16×23, de XII, 445 p. — Prix: US$49.95. — A.K. Peters, Wellesley MA, 1995.

The book on one level examines that most complex machine - the computer - and provides an overview appropriate for all students regardless of whether they pursue their studies of computer science. But it is the idea of complexity itself, and the methods for creating and understanding that complexity, that is the book's real subject. Eck uses his detailed examination of the computer and its applications as a tool for elucidating more abstract ideas.

A.N. TIKHONOV, A.V. GONCHARSKY, V.V. STEPANOV, A.G. YAGOLA. — **Numerical methods for the solution of ill-posed problems.** — Mathematics and its applications, vol. 328. — Un vol. relié, 16×25, de VII, 253 p. — Prix: Dfl. 185.00. — Kluwer Academic Publishers, Dordrecht, 1995.

The theory of ill-posed problems has advanced greatly since A.N. Tikhonov laid its foundations, the Russian original of this book (1990) rapidly becoming a classical monograph on the topic. The present edition has been completely updated to consider linear ill-posed problems with or without a priori constraints (non-negativity, monotonicity, convexity, etc.). Besides the theoretical material, the book also contains a FORTRAN program library.

Recent developments in well-posed variational problems. — Edited by Roberto Lucchetti and Julian Revalski. — Mathematics and its applications, vol. 331. — Un vol. relié, 16 ×25, de VIII, 266 p. — Prix: Dfl. 195.00. — Kluwer Academic Publishers, Dordrecht, 1995.

The present volume emphasises the concepts of approximate solution, well-posedness and stability in optimization, calculus of variations, optimal control, and the mathematics of conflict (e.g. game theory and vector optimization). The most recent developments are covered.

Clifford Henry TAUBES. — **L^2 moduli spaces on 4-manifolds with cylindrical ends.** — Monographs in geometry and topology, vol. 1. — Un vol. relié, 16×23,5, de 205 p. — Prix: US$25.00. — International Press, Cambridge MA, 1995.

This volume gives the reader a clear and concise explanation of L^2 moduli spaces on 4-manifolds. The author gives an overview of the literature that has studied this problem, discusses and extends important results obtained by S. Donaldson, K. Uhlenbeck, L. Simon, and M. Atiyah. For students and researchers interested in the fields of topology and geometry, this monograph is an essential reference tool.

Geometry, topology, & physics: for Raoul Bott. — Edited by S.-T. Yau. — Conference proceedings and lecture notes in geometry and topology, vol. 4. — Un vol. relié, 15 ×23,5, de III, 538 p. — Prix: US$29.00. — International Press, Cambridge MA, 1995.

In 1993, a conference was held honoring Raoul Bott on his 70th birthday. The lectures given during this conference are presented in this volume along with other important mathematical contributions dedicated to Raoul Bott. —: Contents: 16 articles by R. Bryant, P. Griffiths, L. Hsu, J. Cuntz, D. Quillen, R. Forman, D.S. Freed, D. Gabai, E. Getzler, M.M. Kapranov, V. Guillemin, S. Sternberg, E. Heintze, R.S. Palais, C.-L. Terng, G. Thorbergsson, J. Morgan, T. Mrowka, N. Reshetikhin, A. Varchenko, H. Samelson, W. Schmid, K. Vilonen, C. Vafa, E. Witten, M. Atiyah, C.H. Taubes.

Elliptic curves, modular forms, & Fermat's last theorem. — Edited by John Coates and S.T. Yau. — Series in number theory, vol. 1. — Un vol. relié, 18×26, de 191 p. — International Press, Cambridge MA, 1995.

A conference, on the general theme of "Elliptic curves and modular forms" was held in the Mathematics Department of the Chinese University of Hong Kong from December 18-21, 1993. It is now history that Wiles himself, assisted by R. Taylor, found a beautiful proof of the desired upper bound. As a result, we know today the remarkable fact that every semi-elliptic curve over **Q** is modular. This volume is a mixture of the texts of some of these lectures, together with a number of recent articles related to the general theme of the conference.

Edward H. JULIUS. — **Arithmetricks : 50 easy ways to add, subtract, multiply, and divide without a calculator.** — Illustrations by Dale M. Gladstone. — Young Adult/Mathematics. — Un vol. broché, 15,5×23, de XIII, 142 p. — Prix: £7.50. — John Wiley, New York, 1995.

Packed with 50 tricks and tips that let you add, subtract, multiply, and divide in a flash, this book makes math easier and more fun than you've ever imagined. You won't need a calculator, or in many cases even a pencil, to come up with the correct answers. Just a few simple shortcuts will have you solving basic problems in record time.

Udo KAMPS. — **A concept of generalized order statistics.** — Teubner Skripten zur Mathematischen Stochastik. — Un vol. broché, 16×23,5, de 210 p. — Prix: DM 39.80. — B.G. Teubner, Stuttgart, 1995.

The present book is based on "Habilitationsschrift" at the Aachen University of Technology. The main purpose of this volume is to present a concept of generalized order statistics as a unified approach to a variety of models of ordered random variables. The concept of generalized order statistics enables a common approach to structural similarities and analogies. Well known results can be subsumed, generalized, and integrated within a general framework.

Paul WILMOTT, Sam HOWISON, Jeff DEWYNNE. — **The mathematics of financial derivatives: a student introduction.** — Un vol. broché, 15×23, de XIII, 317 p. — Prix: £14.95 (relié: £35.00). — Cambridge University Press, Cambridge, 1995.

In this book the authors describe the modeling of financial derivative products from an applied mathematician's viewpoint, from modeling through analysis to elementary computation. A unified approach to modeling derivative products as partial differential equations is presented, using numerical solutions where appropriate. Some mathematics is assumed, but clear explanations are provided for material beyond elementary calculus, probability and algebra.

J. MADORE. — **An introduction to noncommutative differential geometry and its physical applications.** — London Mathematical Society lecture note series, vol. 206. — Un vol. broché, 15×22,5, de 200 p. — Prix: £22.95. — Cambridge University Press, Cambridge, 1995.

This book arose from the 1994 LMS invited lectures. A significant amount of the differential structure of a smooth manifold can be encoded in the algebra of smooth functions defined by it. A noncommutative geometry is what one obtains when one replaces this algebra by a noncommutative associative algebra. Of particular interest is the case when the algebra is of finite dimension, for example an algebra of matrices. — Contents: Introduction. — Differential geometry. — Matrix Geometry. — Noncommutative geometry. — Vector bundles. — Cyclic homology. — Modifications of space-time. — Extensions of space-time.

C. MOEGLIN, J.-L. WALDSPURGER. — **Spectral decomposition and Eisenstein series: une paraphrase de l'écriture.** — Cambridge tracts in mathematics, vol. 113. — Un vol. relié, 16×23,5, de XXVII, 338 p. — Prix: £50.00. — Cambridge University Press, Cambridge, 1995.

The decomposition of the space $L^2(G(Q) G(A))$, where G is a reductive group defined over Q and A is the ring of adeles of Q, is a deep problem at the intersection of number and group theory. Langlands reduced this decomposition to that of the (smaller) spaces of cuspidal automorphic forms for certain subgroups of G. This book describes this proof in detail. The starting point is the theory of automorphic forms, which can also serve as a first step towards understanding the Arthur-Selberg trace formula.