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## BULLETIN BIBLIOGRAPHIQUE

Serge LANG. — **Elliptic functions.** — Second edition. — Graduate texts in mathematics, vol. 112. — Un vol. relié, 16 × 24, de XI, 326 p. — Prix: DM 78.00. — Springer-Verlag, Berlin, 1987.

Elliptic functions parametrize elliptic curves, and the intermingling of the analytic and algebraic-arithmetic theory has been at the center of mathematics since the early part of the 19th century. *Contents:* General theory. Complex multiplication, elliptic curves with singular invariants. Elliptic curves with non-integral invariant. Theta functions and Kronecker limit formula.

Kennan T. SMITH. — **Power series from a computational point of view.** — Universitext. — Un vol. broché, 15,5 × 24, de VIII, 132 p. — Prix: DM 45.00. — Springer-Verlag, New York, 1987.

The purpose of this book is to explain the use of power series in performing concrete calculations, such as approximating definite integrals or solutions to differential equations. This focus may seem narrow but, in fact, such computations require the understanding and use of many of the important theorems of elementary analytic function theory.

Wen-tsün WU. — **Rational homotopy type: a constructive study via the theory of the  $I^*$ -measure.** — Lecture notes in mathematics, vol. 1264. — Un vol. broché, 16,5 × 24, de VIII, 219 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1987.

This comprehensive monograph provides a self-contained treatment of the theory of  $I^*$ -measure, or Sullivan's rational homotopy theory, from a constructive point of view. It centers on the notion of calculability which is due to the author himself, as are the measure-theoretical and constructive point of view in rational homotopy.

Walter VAN ASSCHE. — **Asymptotics for orthogonal polynomials.** — Lecture notes in mathematics, vol. 1265. — Un vol. broché, 16,5 × 24, de VI, 201 p. — Prix: DM 35.00. — Springer-Verlag, 1987.

This monograph brings together some results involving the asymptotic behaviour of orthogonal polynomials when the degree tends to infinity, assuming only a basic knowledge of real and complex analysis. A new method, based on limit theorems in probability theory, to obtain asymptotic formulas for some polynomials is also given.

**Space curves.** — Proceedings of a conference held in Rocca di Papa, Italy, June 3-8, 1985. — Ed. by F. Ghione, C. Peskine, E. Sernesi. — Lecture notes in mathematics, vol. 1266. — Un vol. broché, 16,5 × 24, de VI, 272 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1987.

The main topics of this conference were good and bad families of projective curves, postulation of projective space curves and classical problems in enumerative geometry.



**Vector bundles on algebraic varieties.** — Papers presented at the Bombay Colloquium 1984, by Atiyah, Ayoub, Barth... *et al.* — Tata Institute of Fundamental Research studies in mathematics, vol. 11. — Un vol. broché, 14,5 × 22, de vi, 555 p. — Prix: £22.50. — Oxford University Press, Oxford, 1987.

This book contains the original papers presented at an International Colloquium on Vector Bundles on Algebraic Varieties held at the Tata Institute of fundamental research. The purpose of the Colloquium was to highlight recent developments in the general area of vector bundles as well as principal bundles on both affine and projective varieties.

Alexandru DIMCA. — **Topics on real and complex singularities.** — Vieweg advanced lectures in mathematics. — Un vol. broché, 16 × 23, de xvii, 242 p. — Prix: DM 54.00. — Friedr. Vieweg & Sohn, Braunschweig, 1987.

This book is an introduction to some basic topics from local singularity theory including finite determinacy, weighted homogeneous singularities, classification and specialization of simple singularities, curve and surface singularities. Special attention is devoted to the simplest interesting connections between singularity theory and classical algebraic geometry or local analytical geometry.

Frederick P. GARDINER. — **Teichmüller theory and quadratic differentials.** — Pure and applied mathematics. — Un vol. relié, 17 × 24, de xvii, 236 p. — Prix: £43.10. — John Wiley and Sons, New York, 1987.

Results from Riemann surface theory and quasiconformal mapping. Minimal norm properties for holomorphic quadratic differentials. The Reich-Strebel inequality for Fuchsian groups. Density theorems for quadratic differentials. Teichmüller theory. Teichmüller's theorem. Teichmüller's and Kobayashi's metrics. Discontinuity of the modular group. Holomorphic self-mappings of Teichmüller space. Quadratic differentials with closed trajectories. Measured foliations.

**Analytic number theory and diophantine problems.** — Proceedings of a conference at Oklahoma State University, 1984. — Edited by A.C. Adolphson, J.B. Conrey, A. Ghosh, R.I. Yager. — Progress in mathematics, vol. 70. — Un vol. broché, 15,5 × 23,5, de viii, 346 p. — Prix: SFr. 62.00. — Birkhäuser, Boston, 1987.

The papers contributed to this meeting covered such important topics as: automorphic forms on  $GL_r$ , diophantine approximation, distribution of prime numbers, non-vanishing results for  $L$ -functions, transcendence theory. Anyone interested in recent developments in these areas will find this book to be a source of new and stimulating ideas.

Robert GOLDBLATT. — **Orthogonality and spacetime geometry.** — Universitext. — Un vol. broché, 15,5 × 23,5, de 190 p. — Prix: DM 54.00. — Springer-Verlag, New York, 1987.

This book examines the geometrical notion of orthogonality, and shows how to use it as the primitive concept on which to base a metric structure in affine geometry. The focus of the book is on geometries having lines which are self-orthogonal, or even singular (orthogonal to all lines). The mathematical background needed is basic abstract and linear algebra.

R.M. JOHNSON. — **Calculus: theory and applications in technology and the physical and life sciences.** — Ellis Horwood series in mathematics and its applications. — Un vol. broché,

17 × 24, de 333 p. — Prix: £14.95. — Ellis Horwood Ltd, Chichester, distributed by John Wiley and Sons, New York, 1987.

The first chapter deals with the revision of essential topics from algebra, geometry and trigonometry, whilst ensuing sections present differential and integral calculus for simple functions together with suitable applications, before the more advanced functions, applications and techniques are considered.

Rudolf AHLWEDE, Ingo WEGENER. — **Search problems.** — Translated by Jean E. Wotschke. — Wiley Interscience series in discrete mathematics and optimization. — Un vol. relié, 17 × 24, de XI, 284 p. — Prix: 29.50. — John Wiley and Sons, Chichester, 1987.

The problems of search, exploration, discovery and identification are of key importance in a wide variety of applications. This book provides a comprehensive survey of the substantial contributions made to these problems by researchers in the last 30 years. The authors emphasize connections to other fields such as stochastic approximation, information theory, statistics and operations research.

David S.G. STIRLING. — **Mathematical analysis: a fundamental and straightforward approach.** — Ellis Horwood series in mathematics and its applications. — Un vol. broché, 16,5 × 24, de 172 p. — Prix: £9.95. — Ellis Horwood Limited, Chichester, distributed by John Wiley and Sons, 1987.

This book presents the accepted core material of mathematical analysis in such a way that the development appears natural and straightforward to the reader, devoting attention not only to giving proofs, but clearly offers intellectual challenge and stimulus to his readers.

Jean MAWHIN. — **Problèmes de Dirichlet variationnels non linéaires: partie 1 des comptes rendus du cours d'été OTAN «Variational methods in nonlinear problems».** — Séminaire de mathématiques supérieures, vol. 104. — Un vol. broché, 16,5 × 28, de 168 p. — Prix: Can\$22.00. — Les Presses de l'Université de Montréal, Montréal, 1987.

Suites minimisantes dans les espaces réflexifs et problèmes de Dirichlet coercitifs ou semi-coercitifs. — Principe de moindre action duale dans les espaces de Hilbert et problèmes de Dirichlet non coercitifs à non-linéarité monotone. — Principes variationnels dans un espace métrique, théorèmes de minimax dans un espace de Banach et problèmes de Dirichlet non coercitifs. — Lemme de déformation, théorèmes de minimax dans un espace de Banach et problèmes de Dirichlet résonants non coercitifs sur le noyau. — Théorie de Morse locale et problèmes de Dirichlet superlinéaires forcés.

Nigel HITCHIN. — **Monopoles, minimal surfaces and algebraic curves.** — Séminaire de mathématiques supérieures, vol. 105. — Un vol. broché, 21,5 × 28, de 94 p. — Prix: Can\$18.00. — Les Presses de l'Université de Montréal, Montréal, 1987.

The material presented here is based on lectures given at the NATO Advanced Study Institute on Integrable Systems held at the Université de Montréal from July 29 to August 16, 1985. The main purpose of these lectures was to provide a unifying framework for a number of different non linear differential equations and to show how an algebraic curve generates the solutions to each one of them.

Max DEHN. — **Papers on group theory and topology.** — Translated and introduced by John Stillwell. — Un vol. relié, 16 × 24,5, de VIII, 396 p. — Prix: DM 78.00. — Springer-Verlag, New York, 1987.

This volume is an attempt to bring Dehn's work to a wider audience, particularly topologists and group theorists curious about the origins of their subject and interested in mining the sources for new ideas. It consists of English translations of eight works: five of Dehn's major papers in topology and combinatorial group theory and three unpublished works which illuminate the published papers and contain some results not available elsewhere.

Aleksei A. DEZIN. — **Partial differential equations: an introduction to a general theory of linear boundary value problems.** — Translated from the Russian by Ralph P. Boas. — Springer series in Soviet mathematics. — Un vol. relié, 16 × 24, de XII, 165 p. — Prix: DM 148.00. — Springer-Verlag, Berlin, 1987.

This is an introduction to the study of boundary value problems for partial differential equations by the methods of functional analysis and spectral theory. The necessary background is presented in the first part of the book. The author studies various types of equations represented by their corresponding operators in Hilbert space, according to their spectral classification. He emphasizes the study of special cases. Special attention is given to operators that admit a natural operational calculus.

I.M. JAMES. — **Topological and uniform spaces.** — Undergraduate texts in mathematics. — Un vol. relié, 16 × 24, de IX, 163 p. — Prix: DM 74.00. — Springer-Verlag, New York, 1987.

This book provides a basic introduction to the theories of topological and uniform spaces, stressing the connection between the two. It is aimed at the advanced undergraduate or beginning graduate student who has a working knowledge of basic set theory, algebra, and analysis. The book contains a large number of exercises for the reader.

Naum Ya. KRUPNIK. — **Banach algebras with symbol and singular integral operators.** — Translated from the Russian by A. Iacob. — Operator theory: advances and applications, vol. 26. — Un vol. relié, 17 × 24, de VIII, 205 p. — Prix: SFr. 88.00. — Birkhäuser Verlag, Basel, 1987.

This book presents the theory of one-dimensional singular integral operators and algebras of such operators. The first part of this book contains the Fredholm theory. The second part analyzes the question of why some Banach algebras of singular integral operators have a symbol and why some of them do not. This analysis is based on the theory of Banach polynomial identity algebras. The book gives also a matrix generalization of the Gelfand transform.

**Numerical treatment of eigenvalue problems, vol. 4.** — Workshop in Oberwolfach, Nov.30 - Dec.6, 1986. — Edited by J. Albrecht, L. Collatz, W. Velte, W. Wunderlich. — International series of numerical mathematics, vol. 83. — Un vol. relié, 17 × 24, de 242 p. — Prix: SFr. 68.00. — Birkhäuser Verlag, Basel, 1987.

Eigenvalue problems taken from the engineering sciences and industry were central to the lectures. Consequently, oscillation and stability problems and their numerical treatment received special consideration. Also, questions concerning the quality of the mathematical models applied, and the choice of appropriate finite elements, were given wide latitude. Other lectures addressed new research results in the calculation of bounds for eigenvalues, and in matrix eigenvalue problems.

Donald L. STANCL, Mildred L. STANCL. — **Real analysis with point-set topology.** — Pure and applied mathematics, vol. 113. — Un vol. relié, 16 × 23,5, de x, 287 p. — Prix: \$45.00 (U.S.A. et Canada) et \$54.00 (Tout autre pays). — Marcel Dekker, Inc., Boston, 1987.

The book covers properties of the real numbers and functions on the reals, continuity, sequences and series, sequences of functions, and integration and differentiation. It considers construction of the real numbers, completion of metric spaces, cardinal numbers, etc... The topological concepts make proofs less technical and easier to understand. The interplay between topology and analysis helps educate students to the power of abstraction and generalization.

**Nonlinear analysis and applications.** — Edited by V. Lakshmikantham. — Lecture notes in pure and applied mathematics, vol. 109. — Un vol. broché, 17,5 × 25, de xix, 649 p. — Prix: US\$119.50. — Marcel Dekker, Inc., New York, 1987.

These are the proceedings of the 7th International Conference on "Nonlinear Analysis and Applications", held at The University of Texas at Arlington, July 28th to August 1st, 1986. The aim of the conference was to feature trends in theory and applications of Nonlinear Analysis. The contents of this proceedings are very broad including theory as well as real world applications. The works in some cases reflect collaborative efforts between mathematicians and other scientists and engineers.

J.R. GILES. — **Introduction to the analysis of metric spaces.** — Australian Mathematical Society lecture series, vol. 3. — Un vol. broché, 15 × 22,5, de xiv, 257 p. — Prix: £8.95. — Cambridge University Press, Cambridge, 1987.

This is an introduction to the analysis of metric and normed linear spaces for undergraduate students in mathematics. Assuming a basic knowledge of real analysis and linear algebra, the student is exposed to the axiomatic method in analysis and is shown its power in exploiting the structure of fundamental analysis, which underlies a variety of applications.

**Homotopy theory: proceedings of the Durham Symposium 1985.** — Edited by E. Rees and J.D.S. Jones. — London Mathematical Society lecture note series, vol. 117. — Un vol. broché, 15 × 22,5, de 247 p. — Prix: £56.00. — Cambridge University Press, Cambridge, 1987.

This collection of papers surveys developments in the subject including some of the spectacular advances in the last few years. Topics covered include the computational complexity of rational homotopy groups, localization and periodicity, unstable homotopy theory, stable splittings and the  $K$ -theory of spaces.

**Non-classical continuum mechanics: proceedings of the London Mathematical Society Symposium, Durham, July 1986.** — Ed. by R.J. Knops and A.A. Lacey. — London Mathematical Society lecture note series, vol. 122. — Un vol. broché, 15 × 22,5, de xii, 335 p. — Prix: £20.00. — Cambridge University Press, Cambridge, 1987.

A major aim of this symposium was to bring together workers in both the abstract and the practical aspects of the subject in order to achieve enhanced appreciation of each other's approach and hence of the mathematical techniques and physical intuition essential for successful research in this field. The present collection is thus a series of concise articles concerning many branches of non-classical continuum mechanics.

Katherine Michelle DAVIS, Yang-Chun CHANG. — **Lectures on Bochner-Riesz means.** — London Mathematical Society lecture note series, vol. 114. — Un vol. broché, 15 × 23, de xi, 150 p. — Prix: £13.95. — Cambridge University Press, Cambridge, 1987.

This book is concerned with the modern theory of Fourier series. Treating developments since Zygmund's classic study, the authors begin with a thorough discussion of the classical one-dimensional theory from a modern perspective. The text then takes up the developments of the 1970s, beginning with Fefferman's famous disc counterexample. The culminating chapter presents Cordoba's geometric theory of Kakeya maximal functions and multipliers.

L.C.G. ROGERS, David WILLIAMS. — **Diffusions, Markov processes and martingales, volume 2: Itô calculus.** — Wiley series in probability and mathematical statistics. — Un vol. relié, 16 × 23,5, de XII, 475 p. — Prix: £39.95. — John Wiley and Sons, Chichester, 1987.

The main themes of this book are stochastic integrals, stochastic differential equations, excursion theory, and the general theory of processes. Much effort has gone into the attempt to make these subjects accessible by providing many concrete examples illustrating techniques of calculation, and by treating all topics, including stochastic differential geometry, from the ground up, starting from the simplest case. Many of the examples and many of the proofs are new, and some important methods of calculation appear for the first time in a book.

SAINT-MARTIN. — **Problèmes résolus de mathématiques, tome 2: examens de mathématiques générales A du C.N.A.M.** — Dunod université. — Un vol. broché, 15,5 × 24, de 278 p. — Dunod, Paris, 1987.

Conçu pour tous les étudiants du premier cycle scientifique, ce recueil est composé de 36 problèmes corrigés posés récemment aux examens de Mathématiques générales A du C.N.A.M. En s'exerçant sur de vrais sujets d'examen, les candidats aux diplômes de l'enseignement supérieur pourront contrôler rigoureusement leurs connaissances. Les auteurs se sont appliqués à illustrer toutes les parties du cours.

**Periodic solutions of Hamiltonian systems and related topics.** — Proceedings of the Nato Advanced Research Workshop held in Ciocco, Italy, October 13-17, 1986. — Edited by P.H. Rabinowitz, A. Ambrosetti, I. Ekeland and E.J. Zehnder. — NATO ASI Series, Series C: mathematical and physical sciences, vol. 209. — Un vol. relié, 16,5 × 24,5, de XI, 284 p. — Prix: Dfl. 145.00. — D. Reidel Publishing Company, Dordrecht, 1987.

The calculus of variations has led to considerable progress in the study of global questions concerning periodic solutions of Hamiltonian systems. The reader will find such questions fully explored in this work, which also contains treatments of the existence of invariant sets for monotone twist maps in the plane, a symplectic geometric interpretation of Hamiltonian structure, periodic and random solutions of the full three-body problem, local resonance questions for periodic solutions, and variational methods in general.

**Advances in multivariate statistical analysis: Pillai Memorial Volume.** — Edited by A.K. Gupta. — Theory and decision library, Series B: mathematical and statistical methods. — Un vol. relié, 16 × 23, de XVI, 389 p. — Prix: Dfl. 180.00. — D. Reidel Publishing Company, Dordrecht, 1987.

This volume is dedicated to the memory of K.C.S. Pillai in recognition of his many contributions to multivariate statistical analysis. It brings together eminent statisticians working in multivariate statistical analysis from around the world. The research and expository papers cover a cross-section of recent developments in the field.

**Differential geometry and its applications.** — Edited by D. Krupka and A. Svec. — Mathematics and its applications (East European series). — Un vol. relié, 17 × 24,5, de XIII, 379 p. — Prix: Dfl. 210.00. — D. Reidel Publishing Company, Dordrecht, 1987.



This volume contains the invited papers presented at the International Conference on Differential Geometry held in Czechoslovakia, August 24-30, 1986. Topics covered include the geometry of fibre bundles, geometric structures, integral geometry, geometric methods in higher-order mechanics, the calculus of variations on fibred spaces, differential identities, quantization... etc.

Felix Alexandrovich BEREZIN. — **Introduction to superanalysis.** — Edited by A.A. Kirilov. — Translated from the Russian by J. Niederle and R. Kotecky. — English translation edited and revised by Dimitri Leites. — Mathematical physics and applied mathematics, vol. 9. — Un vol. relié, 16 × 23, de XII, 424 p. — Prix: Dfl. 265.00. — D. Reidel Publishing Company, Dordrecht, 1987.

Since the middle seventies, notions such as superspaces, supermanifolds, Lie supergroups, and superalgebras, have become familiar terms. One of the pioneers in the development of this field was F.A. Berezin, who has begun to write a book which he never finished. The first part of this volume contains those chapters prepared by Berezin himself, and other chapters have been completed from Berezin's notes or rewritten by colleagues. The second part contains the texts of five preprints prepared by Berezin. Also included are appendices on particle spin dynamics and supergravity.

Izu VAISMAN. — **Symplectic geometry and secondary characteristic classes.** — Progress in mathematics, vol. 72. — Un vol. relié, 15 × 23,5, de VIII, 215 p. — Prix: SFr. 66.00. — Birkhäuser, Boston, 1987.

This book unites two important mathematical subjects: symplectic geometry and the theory of secondary characteristic classes, which until now, were not treated together in the same work. This is a good framework for a study of the Maslov class, a fundamental invariant in the asymptotic analysis of partial differential equations in quantum physics. The characteristic classes which generalize the Maslov class are discussed and their properties established. They are then computed in the cases for Lagrangian and Legendrian submanifolds of cotangent bundles.

**Séminaire de théorie des nombres, Paris, 1985-86.** — Edited by Catherine Goldstein. — Progress in mathematics, vol. 71. — Un vol. relié, 15 × 23,5, de VIII, 208 p. — Prix: SFr. 58.00. — Birkhäuser, Boston, 1987.

This is the sixth annual volume of papers based on the outstanding lectures given at the Séminaire de théorie des nombres de Paris. The results presented in this book by an international group of mathematicians reflect the most recent work in many areas of number theory. — *Contributors:* R. Coleman, P. Debes, G. Frey, S. Friedberg, J.I. Igusa, C. Klingenberg, F. Laubie, M. Laurent, W.C.W. Li, L. Moret-Bailly, G. Rhin, K. Rubin, P. Salberger, A.J. Scholl.

Hans LOEFFEL. — **Blaise Pascal: 1623-1662.** — Vita mathematica, Bd. 2. — Un vol. relié, 16 × 23, de 175 p. — Prix: SFr. 40.00. — Birkhäuser Verlag, Basel, 1987.

Nach einer einleitenden Biographie folgen die einzelnen Wissensbereiche, in denen Pascal schöpferisch tätig war: Projektive Geometrie, Rechenmaschine, arithmetisches Dreieck, Wahrscheinlichkeitsrechnung, Infinitesimalrechnung, Wissenschaftstheorie und Physik. In jedem Kapitel wird exemplarisch ein repräsentativer Gegenstand im Urtext analysiert und in die formal-mathematische Sprache unserer Zeit übersetzt.

**One-parameter semigroups.** — By Ph. Clément, H.J.A.M. Heijmans, S. Angenent, C.J. van Duijn, B. de Pagter. — CWI monograph, vol. 5. — Un vol. relié, 17 × 24,5, de vi, 308 p. — Prix: Dfl. 105.00. — North-Holland, Amsterdam, 1987.

The theory of semigroups of operators was initiated by E. Hille in his monograph "Functional analysis and semigroups" which appeared in 1948. The possible range of applications of the theory is enormous and includes problems in mathematical physics, probability theory and control theory. The purpose of this book is to illustrate the richness of the theory of one-parameter semigroups by examining some of its various aspects. It is written in such a way that all three parts (contraction semigroups, analytic semigroups, positive semigroups) can be read more or less independently.

Walter NOLL. — **Finite-dimensional spaces: algebra, geometry, and analysis, vol. 1. — Mechanics: analysis, vol. 10.** — Un vol. relié, 16,5 × 24,5, de xvi, 393 p. — Prix: Dfl. 235.00. — Martinus Nijhoff Publishers, Dordrecht, 1987.

This treatise unifies all aspects of finite-dimensional spaces by stressing the interplay between algebra, geometry, and analysis. The approach is conceptual, geometric, and uncompromisingly "coordinate-free", although there is a chapter on how to handle coordinates efficiently. The book should be a suitable textbook for core courses in mathematics at the advanced undergraduate and beginning graduate level. It will also be of use to theoretically-inclined scientists and engineers who wish to use contemporary mathematics as a conceptual tool.

J. BOCHNAK, M. COSTE, M.-F. ROY. — **Géométrie algébrique réelle.** — Ergebnisse der Mathematik und ihrer Grenzgebiete, 3. Folge, Bd. 12. — Un vol. relié, 17,5 × 24,5, de x, 373 p. — Prix: DM 188.00. — Springer-Verlag, Berlin, 1987.

The book is the first systematic treatment of real algebraic geometry in its various aspects. The development of real algebraic geometry as an independent branch of mathematics, with its own methods and problems, is quite recent. The subject has strong interrelations with other areas of mathematics, such as algebra, differential topology, and quadratic forms and offers important potential applications to robotics and computer-aided design. Most of the results presented are very recent and have not been published before.

H.G. DALES, W.H. WOODIN. — **An introduction to independence for analysts.** — London Mathematical Society lecture note series, vol. 115. — Un vol. broché, 15 × 23, de xiii, 241 p. — Prix: £15.00/\$29.95. — Cambridge University Press, Cambridge, 1987.

Forcing is a powerful tool from logic which is used to prove that certain propositions of mathematics are independent of the basic axioms of set theory, ZFC. An application of this technique to a deep problem in analysis is presented. This book explains clearly to non-logicians what forcing is, and how it can be used to establish independence results. It provides a full proof of the independence of CH from ZFC, and gives the first accessible proof of the theorem of Solovay and Woodin. The book also includes a discussion of Martin's axiom, and gives some of its applications.

**Multivariate statistical modeling and data analysis.** — Proceedings of the Advanced Symposium on Multivariate Modeling and Data Analysis, May 15-16, 1986. — Edited by H. Bozdogan and A.K. Gupta. — Theory and decision library, series B, mathematical and statistical methods, vol. 8. — Un vol. relié, 15,5 × 23, de ix, 189 p. — Prix: Dfl. 110.00. — D. Reidel Publishing Company, Dordrecht, 1987.

This Symposium was the first to address the need for new innovative approaches in multivariate analysis to develop modern analytical and practical procedures. The areas covered include topics in the analysis of repeated measurements, cluster analysis, canonical correlations, distribution theory and testing, bivariate density estimation, factor analysis, principle component analysis, multidimensional scaling, multivariate linear models, and nonparametric regression.

Daniel EUVRARD. — **Résolution numérique des équations aux dérivées partielles de la physique, de la mécanique et des sciences de l'ingénieur: différences finies, éléments finis.** — Collection "Enseignement de la physique". — Un vol. broché, 16 × 24, de 287 p. — Prix: FF 150.00. — Masson, Paris, 1988.

Cet ouvrage s'adresse aux personnes confrontées avec la nécessité de résoudre numériquement des équations aux dérivées partielles. Il leur propose à la fois un enseignement de culture générale sur les principales équations de la physique et de la mécanique (équations de Laplace, de la chaleur, des cordes vibrantes, de Burgers, de Navier-Stokes) et un ensemble de techniques numériques pour les discrétiser et les résoudre.

H.M.S. COXETER. — **Projective geometry.** — Second edition, second printing. — Un vol. relié, 16 × 25, de XII, 162 p. — Prix: DM 59.00. — Springer-Verlag, New York, 1987.

Triangles and quadrangles. The principle of duality. The fundamental theorem and Pappus's theorem. One dimensional and two dimensional projectivities. Polarities. The conic. A finite projective plane. Parallelism. Coordinates. Answers to exercises.

L.D. FADDEEV, L.A. TAKHTAJAN. — **Hamiltonian methods in the theory of solitons.** — Translated from the Russian by A.G. Reyman. — Springer series in Soviet mathematics. — Un vol. relié, 16 × 24, de IX, 592 p. — Prix: DM 198.00. — Springer-Verlag, Berlin, 1987.

This book presents the foundations of the inverse scattering method and its applications to soliton theory. This approach has not yet been presented systematically elsewhere in the literature. **Contents:** *The nonlinear Schrödinger equation (NS model):* Zero curvature representation. The Riemann problem. The Hamiltonian formulation. *General theory of integrable evolution equations:* Basic examples and their general properties. Fundamental continuous models. Fundamental models of the lattice. Lie algebraic approach to the classification and analysis of integrable models.

I. BORG, J. LINGOES. — **Multidimensional similarity structure analysis.** — Un vol. relié, 16 × 24, de XIV, 390 p. — Prix: DM 78.00. — Springer-Verlag, New York, 1987.

This book comprises a class of models that represent similarity among entities (for example, variables, objects, persons, etc.) in multidimensional space to permit one to grasp more easily the interrelations and patterns present in the data. The book is replete with examples and illustrations of the various techniques drawn largely from the social sciences, with a heavy emphasis on the geometric or spatial aspect of the data representations.

**Functional analysis II.** — With contributions by J. Hoffmann-Jorgensen *et al.* — Ed. by S. Kurepa, H. Kraljevic and D. Butkovic. — Lecture notes in mathematics, vol. 1242. — Un vol. broché, 16,5 × 24, de VII, 432 p. — Prix: DM 65.00. — Springer-Verlag, Berlin, 1987.

This volume contains lecture notes given at Postgraduate School and Conference on Functional Analysis held from Nov. 3 - 17, 1985, at the Inter-University Center of Postgraduate Studies, Dubrovnik, Yugoslavia. The lectures and communications were devoted mainly to



functional-analytic aspects of probability theory and operator theory on Hilbert and Banach spaces.

Tetsuo KAISE. — **Représentations de Weil et  $GL_2$ . Algèbres de division et  $GL_n$ . (Vers les corps de classes galoisiens I, II).** — Lecture notes in mathematics, vol. 1252. — Un vol. broché,  $16,5 \times 24$ , de VII, 203 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1987.

Tiré de la préface: «... je présente ici les deux premières parties de mes recherches sur la généralisation de la théorie du corps de classes pour les cas non commutatifs. Afin de mettre en évidence la trinité «groupe de Weil - algèbre de division -  $GL_n$ » dominante à cet égard, nous établissons une relation étroite entre les représentations des deux derniers objets, localisés en une place finie quelconque...»

J. LINDENSTRAUSS, V.D. MILMAN (eds.). — **Geometrical aspects of functional analysis, Israel Seminar, 1985-86.** — Lecture notes in mathematics, vol. 1267. — Un vol. broché,  $16,5 \times 24$ , de VII, 212 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1987.

The Israel Seminar on the Geometric Aspects of Functional Analysis was held between October 1985 and June 1986. The present volume is the second published proceedings of the Seminar. A central topic of the seminar was the study of convex sets in  $R^n$  and infinite-dimensional spaces.

S.G. KRANTZ (ed.). — **Complex analysis, Seminar, University Park, PA, March 10-14, 1986.** — Lecture notes in mathematics, vol. 1268. — Un vol. broché,  $16,5 \times 24$ , de VII, 195 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1987.

The lead article in this volume is a rather personal assessment of progress in Several Complex Variables in the past 15 years. Subsequent articles in the volume point to a number of new paths which the subject is expected to follow.

Masahiro SHIOTA. — **Nash manifolds.** — Lecture notes in mathematics, vol. 1269. — Un vol. broché,  $16,5 \times 24$ , de VI, 223 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1987.

The purpose of the author in this volume is to construct a theory of real manifolds equipped with "algebraic" structures. Real nonsingular algebraic varieties display apparently singular phenomena, and this suggests that a unified theory should not be expected to emerge from them. It shall be seen, however, that the objects considered form a broader class than the real nonsingular algebraic varieties.

A.M. COHEN, W.H. HESSELINK, W.L.J. VAN DER KALLEN, J.R. STROOKER (eds.). — **Algebraic groups, Utrecht 1986.** — Proceedings of a Symposium in honour of T.A. Springer. — Lecture notes in mathematics, vol. 1271. — Un vol. broché,  $16,5 \times 24$ , de VII, 284 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1987.

To honour Prof. Springer, a number of leading experts in the field of algebraic groups were invited to lecture on their current research; in this way a wide spectrum of topics was covered and the central role of algebraic groups in mathematics emphasized. All of the speakers had close scholarly and personal contacts with Springer at one time or another.

Moshe S. LIVSIC, Leonid L. WAKSMAN. — **Commuting nonselfadjoint operators in Hilbert space: two independent studies.** — Lecture notes in mathematics, vol. 1272. — Un vol. broché,  $16,5 \times 24$ , de III, 115 p. — Prix: DM 23.00. — Springer-Verlag, Berlin, 1987.

Cette monographie consiste en deux articles, le premier intitulé "Commuting nonselfadjoint operators and collective notions of systems" par M.S. Livsic et le deuxième "Harmonic analysis of multi-parameter semigroups of contractions" par L. Waksman.

G.-M. GREUEL, G. TRAUTMANN (eds.). — **Singularities, representation of algebras, and vector bundles.** — Proceedings of a Symposium, held in Lambrecht/Pfalz, December 13-17, 1985. — Lecture notes in mathematics, vol. 1273. — Un vol. broché, 16,5 × 24, de xiv, 383 p. — Prix: DM 57.50. — Springer-Verlag, Berlin, 1987.

The purpose of this symposium was to discuss and promote recent developments of the interaction of singularity theory with representation of algebras and vector bundles. It was held at the Pfalzakademie in Lambrecht/Pfalz, West Germany.

N. Christopher PHILLIPS. — **Equivariant K-theory and freeness of group actions on C\*-algebras.** — Lecture notes in mathematics, vol. 1274. — Un vol. broché, 16,5 × 24, de viii, 371 p. — Prix: DM 57.50. — Springer-Verlag, Berlin, 1987.

*Contents:* Equivariant K-theory of C\*-algebras. Introduction to equivariant KK-theory. Basic properties of K-freeness. Subgroups. Tensor products. K-freeness, saturation, and the strong Connes spectrum. Type I algebras. AF algebras.

Carlos A. BERENSTEIN (ed.). — **Complex analysis I, II, III.** — Proceedings of the Special Year held at the University of Maryland, College Park, 1985-86. — Lecture notes in mathematics, vol. 1275, 1276, 1277. — 3 vol. brochés, 16,5 × 24, de xv/331 p., ix/320 p., x/350 p. — Prix: DM 50.00, DM 50.00, DM 57.50. — Springer-Verlag, Berlin, 1987.

The past several years have witnessed a striking number of important developments in complex analysis of both one and several variables. Through these advances the essential unity of these two previously rather separate branches of function theory has become increasingly apparent. More and more, ideas and constructs that first arose in function theory of one variable are playing an important role in the several variables theory. For these reasons, the Department of Mathematics of the University of Maryland decided to dedicate its 16th Special Year to the subject of Complex Analysis.

Erhard NEHER. — **Jordan triple systems by the grid approach.** — Lecture notes in mathematics, vol. 1280. — Un vol. broché, 16,5 × 24, de xii, 193 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1987.

*Contents:* Special families of compatible tripotents. Classification of grids. Coordinatization theorems. Classifications.

Jacques VELU. — **Méthodes mathématiques pour l'informatique.** — Collection «Dunod Informatique» — Un vol. broché, 15,5 × 24, de x, 260 p. — Prix: FF 120.00. — Dunod, Paris, 1987.

Les thèmes abordés dans cet ouvrage (analyse combinatoire, probabilités discrètes, calcul propositionnel, algèbre de Boole, arithmétique, codes détecteurs et correcteurs d'erreurs) ont été choisis tant pour donner une solide base de connaissances mathématiques aux utilisateurs de l'informatique et aux informaticiens que parce qu'ils donnent l'occasion de voir comment on modélise les problèmes pour les résoudre.

Henri MASCART, Marius STOKA. — **Fonctions d'une variable réelle: équations différentielles. Tome 3: exercices et corrigés.** — Collection «Mathématiques». — Un vol. broché,  $15 \times 21$ , de 209 p. — Prix: FF 195.00. — Presses Universitaires de France, Paris, 1987.

La résolution d'une équation différentielle est l'un des problèmes d'Analyse les plus fréquents parmi ceux que rencontrent aussi bien les ingénieurs que les scientifiques. La diversité et la souplesse des différentes méthodes de résolution possibles sont démontrées, ainsi que leurs apports mutuels et l'interprétation géométrique n'est pas oubliée.

G. ENDERLE, K. KANSY, G. PFAFF. — **Computer graphics programming: GKS - the graphics standard.** — Second, revised and enlarged edition. — Springer series: "Symbolic computation". — Un vol. relié,  $17 \times 24$ , de XXIII, 651 p. — Prix: DM 148.00. — Springer-Verlag, Berlin, 1987.

This second edition presents GKS - the first international standard for computer graphics. The book contains a detailed presentation of computer graphics programming with GKS, both in Pascal and FORTRAN programming language. Several revisions and changes have been added in order to continue offering a complete reference for using and implementing the Graphical Kernel System and its environment.

Stanley REITER (ed.). — **Studies in mathematical economics.** — Studies in mathematics, vol. 25. — Un vol. relié,  $14 \times 21$ , de XIII, 441 p. — Prix: £38.25. — The Mathematical Association of America, Washington D.C. (distributed by John Wiley and Sons, Chichester), 1986.

In recent times, mathematics has played an essential role in economic theory, especially in microeconomic theory. The variety of mathematical ideas and techniques used in economics has increased dramatically in the past few decades, and so has its depth. This study is not, however, intended to be an encyclopedic survey either of economic theory or of mathematics used in economics. The papers present a number of applications of mathematics in economics which are valuable as economics and have genuine mathematical interest.

**International mathematical Olympiads, 1978-1985 and forty supplementary problems.** — Compiled and with solutions by Murray S. Klamkin. — New mathematical library, vol. 31. — Un vol. broché,  $15 \times 23$ , XII, 141 p. — Prix: £10.50. — The Mathematical Association of America, Washington D.C. (distributed by John Wiley and Sons, Chichester), 1986.

De la préface: "... our aim in all problem collections of this series is not only to help the high school student satisfy his curiosity by presenting solutions with tools familiar to him, but also to instruct him in the use of more sophisticated methods and different modes of attack by including explanatory material and alternate solutions."

Benoît B. MANDELBROT. — **Die fraktale Geometrie der Natur.** — Übers. aus d. Engl. — Un vol. relié,  $20,5 \times 22,5$ , de 491 p. — Prix: SFr. 98.00. — Birkhäuser Verlag, Basel, 1987.

Von einem Mathematiker geschrieben ist es doch kein Buch über Mathematik. Mit zahlreichen computererzeugten Bildern illustriert, beschäftigt es sich aber nicht mit Computergraphik. In Zusammenarbeit mit Physikern, Chemikern, etc. gelangte der Autor zu der Überzeugung, dass zahlreichen bislang nur unvollkommen beschriebenen Phänomenen ein einheitliches Prinzip zugrunde liegt: die Selbstähnlichkeit.

Stefan ROLEWICZ. — **Functional analysis and control theory: linear systems.** — Mathematics and its applications (East European series), vol. 29. — Un vol. relié,  $15,5 \times 23$ , de xv, 524 p. — Prix: Dfl. 295.00. — D. Reidel Publishing Co., Dordrecht, 1987.

In the past few years, the language and methods of functional analysis have become fundamental tools in optimization theory. After a short course on functional analysis, the author deals with a general theory of linear systems, seen here as a special part of the theory of linear operators in Banach spaces. The last section of the book involves applications of the developed theory to different types of linear systems.

N.N. VAKHANIA, V.I. TARIELADZE and S.A. CHOBANYAN. — **Probability distributions on Banach spaces.** — Mathematics and its applications (Soviet series), vol. 14. — Un vol. relié, 15,5 × 23, de XXVI, 482 p. — Prix: Dfl. 245.00. — D. Reidel Publishing Co., Dordrecht, 1987.

The language and concepts of probability theory have recently found applications in a great variety of disciplines, both inside and outside mathematics. To a large extent, this phenomenon can be explained by the fact that in the last few decades many classical results of probability theory have been extended to more general structures, including the important case of Banach structures.

B.S. RAZUMIKHIN. — **Classical principles and optimization problems.** — Mathematics and its applications (Soviet series), vol. 15. — Un vol. relié, 15,5 × 23, de XIV, 513 p. — Prix: Dfl. 270.00. — D. Reidel Publishing Co., Dordrecht, 1987.

This work is about problems of mathematical programming and optimal control. A significant portion of the book deals with methods and algorithms for the numerical solution of constrained optimization problems associated with classical principles of analytical mechanics and thermodynamics. The treatment of linear optimization problems, linear economic models, and the question of variables is accompanied by physical analogues or models, which clearly illustrate the theoretical results as well as the algorithms for obtaining numerical solutions.

**Operator methods for optimal control problems.** — Ed. by Sung J. Lee. — Lecture notes in pure and applied mathematics, vol. 108. — Un vol. broché, 18 × 25, de VII, 316 p. — Prix: US\$ 79.50 (USA and Canada); US\$ 95.25 (all other countries). — Marcel Dekker, New York, 1987.

This special session on operator methods of optimal control problems held at the Annual Meeting of the American Mathematical Society in New Orleans, 1986, includes full-length research papers and state-of-the-art survey articles as well as research announcements.

Andor KERTESZ. — **Lectures on Artinian rings.** — Ed. by Richard Wiegandt. — *Disquisitiones mathematicae hungaricae*, vol. 14. — Un vol. relié, 17,5 × 24, de 427 p. — Prix: US\$ 48.00. — Akadémiai kiado, Budapest, 1987.

The theory of artinian rings, this important and rapidly developing field of algebra, is discussed in this book starting with the classical structure theory of rings. New related topics complete this edition, such as rings of quotients, quasi-Frobenius rings, Connell's theorem on artinian group rings and Vamos' theorem on finitely embedded modules. Numerous recently discovered results are also included.

Elemér E. ROSINGER. — **Generalized solutions of nonlinear partial differential equations.** — North-Holland mathematics studies, vol. 146. — *Notas de matemática*, 119. — Un vol. broché, 16,5 × 24, de XVIII, 410 p. — Prix: Dfl. 175.00. — North-Holland, Amsterdam, 1987.

The aim of this volume is to offer the reader a sufficiently detailed introduction to some of the recent nonlinear theories which have emerged during the last few years. *Contents:* Review

of some essentials in weak solutions and distributions. Colombeau's nonlinear theory of generalized functions. A necessary structure for nonlinear theories of generalized functions.

Palle E.T. JORGENSEN. — **Operators and representation theory: canonical models for algebras of operators arising in quantum mechanics.** — North-Holland mathematics studies, vol. 147. — Notas de matemática, vol. 120. — Un vol. broché, 16,5 × 24, de VIII, 338 p. — Prix: Dfl. 175.00. — North-Holland, Amsterdam, 1988.

This volume focuses on representations of the universal enveloping algebra, covariant representations in general, and infinite-dimensional Lie algebras in particular. It also provides new applications of recent results on integrability of finite-dimensional Lie algebras. As a central theme, it is shown that a number of recent developments in operator algebras may be handled in a particularly elegant manner by the use of Lie algebras, extensions, and projective representations.

**Combinatorial design theory.** — Edited by Charles J. Colbourn, Rudolf Mathon. — North-Holland mathematics studies, vol. 149. — Annals of discrete mathematics, vol. 34. — Un vol. broché, 16,5 × 24, de XII, 470 p. — Prix: Dfl. 170.00. — North-Holland, Amsterdam, 1987.

This volume is a collection of forty-one research articles spanning all of combinatorial design theory. The articles develop new methods for the construction and analysis of designs and related combinatorial configurations. Both new theoretical methods, and new computational tools and results, are presented. In particular, they extend the current state of knowledge on Steiner systems, Latin squares, one-factorizations, block designs, graph designs, packings and coverings, and develop recursive and direct constructions.

Christian CALUDE. — **Theories of computational complexity.** — Annals of discrete mathematics, vol. 35. — Un vol. relié, 17 × 24,5, de XII, 488 p. — Prix: Dfl. 200.00. — North-Holland, Amsterdam, 1988.

This volume presents four machine-independent theories of computational complexity, which have been chosen for their intrinsic importance and practical relevance. The book includes a wealth of results, classical, recent, and others which have not been published before. In developing the mathematics underlying the size, dynamic and structural complexity measures, various connections with mathematical logic, constructive topology, probability and programming theories are established. Extensive examples are provided.

**Logic Colloquium '86.** — Proceedings of the Colloquium held in Hull, U.K., July 13-19, 1986. — Edited by F.R. Drake and J.K. Truss. — Studies in logic and the foundations of mathematics, vol. 124. — Un vol. relié, 16 × 23, de X, 342 p. — Prix: Dfl. 180.00. — North-Holland, Amsterdam, 1988.

The result of the European Summer Meeting of the Association for Symbolic Logic, this volume gives an overview of the latest developments in most of the major fields of logic being actively pursued today. Important developments in the applications of logic in computer science are presented. Other areas examined include model theory, set theory, recursion theory, proof theory, and the history of logic.

D.G. REES. — **Foundations of statistics.** — Science paperbacks, vol. 214. — Un vol. broché, 15,5 × 23,5, de XIV, 543 p. Prix: £12.50. — Chapman and Hall, London, 1987.

This book provides a thorough yet straightforward first course on the basics of statistics. Included are sections on measurement and representation of data, probability, distributions,



correlation, regression and experimental design, in sufficient detail for an introductory college course. The emphasis is on the application of theory as demonstrated in a wide range of fully worked, relevant examples. Each chapter is followed by exercises, complete with hints and answers. Statistical tables are given.

B.S. EVERITT. — **Introduction to optimization methods and their application in statistics.** — Un vol. broché,  $15 \times 23,5$ , de vi, 88 p. — Prix: £9.50. — Chapman and Hall, London, 1987.

Optimization methods are used to find the values of a set of parameters which maximize or minimize some objective function of interest. This text provides a brief introduction to these increasingly important techniques and should be useful to students on applied statistics courses and to researchers who need to use optimization techniques in a statistical context.

M. KAROUBI, C. LERUSTE. — **Algebraic topology via differential geometry.** — London Mathematical Society lecture note series, vol. 99. — Un vol. broché,  $15,5 \times 22,5$ , de x, 363 p. — Prix: £15.00/\$29.95. — Cambridge University Press, Cambridge, 1987.

In this volume, the authors seek to illustrate how methods of differential geometry find application in the study of the topology of differential manifolds. Prerequisites are few since the authors take pains to set out the theory of differential forms and the algebra required. The reader is introduced to De Rham cohomology, and explicit and detailed calculations are present as examples. Topics covered include Mayer-Vietoris exact sequences, relative cohomology, Poincaré duality and Lefschetz's theorem. Mathematicians studying relativity and mathematical physics will find this an invaluable introduction to the techniques of differential geometry.

M.J. SEWELL. — **Maximum and minimum principles: a unified approach, with applications.** — Cambridge texts in applied mathematics. — Un vol. broché,  $15,5 \times 23$ , de xii, 468 p. — Prix: £19.50/\$34.50 (relié: £50.00/\$79.50). — Cambridge University Press, Cambridge, 1987.

In many problems of applied mathematics, an energy expenditure or its analogue can be approximated by upper and lower bounds. This book provides a unified account of the theory required to establish such bounds, by expressing the governing conditions of the problem, and the bounds, in terms of a saddle functional and its gradients. There are several novel features, including a chapter on the Legendre dual transformation and some of its singularities. Here the author uses the elementary catastrophes as part of a thorough account of duality for non-convex functions which is not available elsewhere. Many substantial examples and exercises are included, especially from the mechanics of fluids, elastic and plastic solids and from optimization theory.

Bernd HEINRICH. — **Finite difference methods on irregular networks: a generalized approach to second order elliptic problems.** — International series of numerical mathematics, vol. 82. — Un vol. relié,  $17 \times 24$ , de 206 p. — Prix: SFr. 68.00. — Birkhäuser Verlag, Basel, 1987.

The monograph contains a systematic treatment of the finite difference method on irregular networks for solving numerically elliptic boundary value problems, where linear elliptic differential equations of second order in plane domains, various kinds of boundary conditions and curvilinear boundaries are taken into account. The main topics are: the construction of finite difference-approximations on networks which consist of triangles (rectangles) and may be irregular in the whole domain, the proof of symmetry, definiteness and monotonicity

(maximum principles) of the difference operators, a priori and error estimates with discrete norms in Hilbert spaces, convergence results for solutions belonging to Sobolev spaces.

V.I. ARNOL'D. — **Geometrische Methoden in der Theorie der gewöhnlichen Differentialgleichungen.** — Un vol. relié, 17,5 × 23,5, de 320 p. — Prix: SFr. 58.00. — Birkhäuser Verlag, Basel, 1987.

Im vorliegenden Buch ist eine Reihe von Ideen und Methoden dargelegt, die bei der Untersuchung gewöhnlicher Differentialgleichungen und ihrer Anwendungen in der Naturwissenschaften verwendet werden. Die elementaren Integrationsmethoden werden aus der Sicht allgemein-mathematischer Begriffe behandelt. Die Theorie der partiellen Differentialgleichungen erster Ordnung wird auf der Grundlage der Geometrie der Kontaktstruktur dargelegt. Weitere Kapitel sind der qualitativen Theorie der Differentialgleichungen, analytischen Methoden der lokalen Theorie in der Umgebung eines singulären Punktes oder einer periodischen Lösung wie auch der Bifurkationstheorie der Phasenbilder bei Parameteränderung gewidmet.

A.V. SKOROHOD. — **Stochastic equations for complex systems.** — Mathematics and its applications (Soviet series), vol. 13. — Un vol. relié, 16,5 × 25, de xvii, 175 p. — Prix: Dfl. 140.00. — D. Reidel Publishing Company, Dordrecht, 1988.

This volume presents a study of stochastic systems described by Markov processes in complex phase spaces, spaces with unboundedly growing or infinite dimension, and spaces which are locally non-Euclidean. The main method of investigation is the employment of infinite systems of linear stochastic equations of special type. — *Contents:* Continuous Markov processes in a locally compact space and stochastic equations. Randomly interacting systems of particles.

**Encyclopaedia of mathematics: an updated and annotated translation of the Soviet "Mathematical Encyclopaedia", vol. 1: A-B.** — Edited by M. Hazewinkel. — Un vol. relié, 22 × 31, de ix, 488 p. — Prix: Dfl. 365.00. — D. Reidel Publishing Company, Dordrecht, 1988.

This Encyclopaedia of mathematics aims to be a reference work for all parts of mathematics. It is a translation with updates and editorial comments of the "Soviet mathematical encyclopaedia" published in 5 volumes in 1977-1985. The annotated translation consists of 10 volumes including a special index. There are three kinds of articles in this Encyclopaedia. First of all there are survey-type articles dealing with the various main directions in mathematics. The second kind of article, of medium length, contains more detailed concrete problems, results and techniques, and requires more background expertise. Finally, there is a third kind of article: short (reference) definitions. Practically all articles contain a list of references. The final volume of this Encyclopaedia will be an index which will contain all the titles of the articles (some 6600) and in addition the names of all the definitions, named theorems, algorithms, lemmas, scholia constructions, etc... which occur in the various articles.

J.C. McCONNELL and J.C. ROBSON. — **Noncommutative Noetherian rings.** — With the cooperation of L.W. Small. — Pure and applied mathematics. — Un vol. relié, 16,5 × 24, de xvi, 596 p. — Prix: £65.00. — John Wiley and Sons, Chichester, 1987.

This book presents, within a wider context, a comprehensive account of noncommutative Noetherian rings. It covers the major developments of the last 30 years which stem from Goldie's theorem, including applications to group rings, enveloping algebras of Lie algebras, PI rings, differential operators and localization theory. The book is not restricted to Noetherian

rings, but discusses wider classes of rings when the methods being described apply more generally. Most of the material in the book has not previously appeared outside the research literature, and considerable revisions, improvements and extensions have been made.

Richard H. RAND, Dieter ARMBRUSTER. — **Perturbation methods, bifurcation theory and computer algebra.** — Applied mathematical sciences, vol. 65. — Un vol. broché, 15,5 × 23,5, de ix, 243 p. — Prix: DM 64.00. — Springer-Verlag, New York, 1987.

Perturbation methods have always been an important tool for treating nonlinear differential equations. This book offers computer algebra (MACSYMA) programs which implement the most popular perturbation methods. Not only does this avoid the errors associated with hand computation, but the increase in efficiency permits more complicated problems to be tackled. Methods covered include: Lindstedt's method, center manifolds, normal forms, two variable expansion method (method of multiple scales), averaging, Lie transforms and Liapunov-Schmidt reduction. The MACSYMA code for each method is given.

I.M. YAGLOM. — **Felix Klein and Sophus Lie: evolution of the idea of symmetry in the nineteenth century.** — Translated by Sergei Sossinsky. — Edited by Hardy Grant and Abe Shenitzer. — Un vol. relié, 16 × 24,5, de vii, 237 p. — Prix: SFr. 68.00. — Birkhäuser, Boston, 1988.

Symmetry evolved in the nineteenth century into a fundamental idea in mathematics and science. The scientists who contributed to this evolution, Felix Klein and Sophus Lie, are the main focus of this book. The author pays special attention to the difference between the more analytical approach of the algebraists and the physical reasoning of the geometers. This historical account assumes no more than a high school background in mathematics and can thus be enjoyed by a wide range of readers.

Semyon Grigorevich GINDIKIN. — **Tales of physicists and mathematicians.** — Translated by Alain Shuchat. — Un vol. relié, 16 × 24, de x, 157 p. — Prix: SFr. 48.00. — Birkhäuser, Boston, 1988.

Why did the sixteenth century mathematicians Cardano and Tartaglia compete in an algebra duel? How did Galileo's discoveries of the laws of physics and planetary motion lead to his trial by the Inquisition? How did Gauss, using only a straightedge and compass, solve a 2000-year-old mathematical mystery? These are some of the questions answered in this lively account of the lives and achievements of such outstanding scientists as Cardano, Tartaglia, Galileo, Huygens, Pascal and Gauss. The book describes the situation of mathematics and physics in the sixteenth to nineteenth centuries, and will be enjoyable reading for anyone interested in the history of science.

**Shaping space: a polyhedral approach.** — Marjorie Senechal and George Fleck, editors. — Design science collection. — A "Pro scientia viva" title. — Un vol. relié, 20 × 27,5, de xx, 284 p. — Prix: SFr. 82.00. — Birkhäuser, Boston, 1988.

This book is an exuberant, richly-illustrated, interdisciplinary guide to three-dimensional forms, focusing on the surprisingly diverse world of polyhedra. Polyhedra are everywhere. "Shaping space" begins with a stunning pictorial essay, a tour of the Polyhedron Kingdom. The book then provides some recipes for novice and expert for building models of polyhedral forms. Then many facets of polyhedra are explored, including theory, history, and a study of the creative process. Later chapters examine polyhedron theory in more detail and applications of



polyhedra in science and engineering. Geometry comes alive in this book, as a remarkable range of geometric ideas is explored and its centrality in our culture is persuasively demonstrated.

Pierre MOLINO. — **Riemannian foliations.** — Translated by Grant Cairns. — With appendices by G. Cairns, Y. Carrière, E. Ghys, E. Salem, V. Sergiescu. — Progress in mathematics, vol. 73. — Un vol. relié,  $15,5 \times 23,5$ , de XII, 339 p. — Prix: SFr. 68.00. — Birkhäuser, Boston, 1988.

A foliation on Riemannian manifold is "Riemannian" if the distance of one leaf to another is locally constant. This condition introduced by B. Reinhart in 1959, is a very natural one, and this type of foliation is of particular interest for applications. This book presents the first elementary exposition of basic results in Riemannian foliations obtained in the last ten years. The structure theorems for Riemannian foliations on closed manifolds are described in a self-contained, detailed way with exercises at the end of each chapter so that the book may be used as a graduate text. The exposition will provide several themes of research for advanced students in differential geometry. Five appendices by different contributors give recent developments extensions, and suggestive ideas about related topics.

Tanjiro OKUBO. — **Differential geometry.** — Pure and applied mathematics, vol. 112. — Un vol. relié,  $16,5 \times 23,5$ , de XVIII, 788 p. — Prix: \$125.00 (U.S.A. et Canada), \$150.00 (tout autre pays). — Marcel Dekker, Inc., New York, 1987.

Ideal as both a textbook for graduate and upper-level undergraduate students and as a reference for mathematicians, this book provides a background for the study of local and global differential geometry, particularly tensor analysis developed on differentiable manifolds. In addition, it gives proof of the de Rham cohomology theorem in terms of sheaf theory, constructs the characteristic classes of differentiable manifolds by using the Weil theorem, and states the de Rham-Hodge decomposition theorem and the Hodge theorem of harmonic forms on compact and orientable Riemannian manifolds.

Thomas C. GARD. — **Introduction to stochastic differential equations.** — Pure and applied mathematics, vol. 114. — Un vol. relié,  $16,5 \times 23,5$ , de XI, 234 p. — Prix: \$65.00 (U.S.A. et Canada), \$78.00 (tout autre pays). — Marcel Dekker, Inc., New York, 1987.

Presenting applications to population dynamics and numerical simulation of sample paths for the first time in book form, this volume, serving as a text and reference, gives a self-contained treatment of the basic theory of stochastic differential equations (SDE's). It stresses the relationship between stochastic and ordinary differential equations theories that justifies the SDE's formalism. This book is completed with practical exercises at the end of chapters.

Claes JOHNSON. — **Numerical solution of partial differential equations by the finite element method.** — Un vol. broché,  $15,5 \times 22,5$ , de 278 p. — Prix: £15.00 (relié: £40.00). — Cambridge University Press, Cambridge, 1988.

This book gives an introduction to the finite element method as a general method for the numerical solution of partial differential equations in science and engineering. The book gives the mathematical foundation of the method together with important numerical aspects but there is also a clear connection with applications and many examples from various fields are considered. A strong effort has been made to make the presentation of the mathematics as non-technical and easily accessible as possible. The book contains unique recent developments of finite element techniques to parabolic problems including methods for automatic line step

control, and in particular to hyperbolic problems with important applications to e.g. fluid mechanics.

Dorin IESAN. — **Saint-Venant's problem.** — Lecture notes in mathematics, vol. 1279. — Un vol. broché,  $16,5 \times 24$ , de VIII, 162 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

This monograph is concerned with the equilibrium of linearly elastic cylinders. It gives an up-to-date and systematic treatment of extension, bending, torsion and flexure of cylinders, including the deformation of homogeneous and nonhomogeneous anisotropic elastic cylinders by loads distributed on their lateral surfaces. Minimum energy characterizations of the solutions are discussed. An analysis of Saint-Venant's principle, in the context for which it was originally intended, is also presented.

David E. HANDELMAN. — **Positive polynomials, convex integral polytopes, and a random walk problem.** — Lecture notes in mathematics, vol. 1282. — Un vol. broché,  $16,5 \times 24$ , de XI, 136 p. — Prix: DM 23.00. — Springer-Verlag, Berlin, 1987.

Emanating from the theory of  $C^*$ -algebras and actions of tori theorem, the problems discussed here are outgrowths of random walk problems on lattices. There are also strong connections with convex analysis, Choquet theory, and reflection groups. *Contents:* A random walk problem. Integral closure and Cohen-Macaulayness. Projective  $Rk$ -modules are free. States and ideals. Factoriality and integral simplicity. Meet-irreducible ideals in  $Rk$ . Isomorphisms.

**Group theory.** — Proceedings of a conference held at Brixen/Bressanone, Italy, May 25-31, 1986. — Edited by O.H. Kegel, F. Menegazzo, G. Zacher. — Lecture notes in mathematics, vol. 1281. — Un vol. broché,  $16,5 \times 24$ , de VII, 179 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

At the International Group Theory Conference in Bressanone recent trends and results in different areas of group theory were presented and discussed. These proceedings contain some survey articles and a number of research papers touching on a wide range of topics including permutation groups, automorphisms, presentations, products of subgroups, locally finite groups, soluble group and related problems, with some emphasis on infinite groups.

**Geometric topology and shape theory.** — Proceedings of a conference held in Dubrovnik, Yugoslavia, Sept. 29 - Oct. 10, 1986. — Edited by S. Mardesic, J. Segal. — Lecture notes in mathematics, vol. 1283. — Un vol. broché,  $16,5 \times 24$ , de V, 261 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1987.

The aim of this conference was to survey recent developments in geometric topology and shape theory with an emphasis on their interaction. The main topics and themes represented by the papers of this volume include decomposition theory, cell-like mappings and  $CE$ -equivalent compacta, covering dimension versus cohomological dimension, homology manifolds, embeddings of continua into manifolds, complement theorems in shape theory, approximate fibrations and shape fibrations, fibered shape, exact homologies and strong shape theory.

Bernd Heinrich MATZAT. — **Konstruktive Galoistheorie.** — Lecture notes in mathematics, vol. 1284. — Un vol. broché,  $16,5 \times 24$ , de X, 286 p. — Prix: DM 42.50. — Springer-Verlag, 1987.

This volume is based on a lecture course on constructive Galois Theory given in Karlsruhe by the author. The purpose of the course was to introduce students to the methods developed in the past few years for the realization of finite groups as Galois groups over  $\mathbb{Q}$  or over abelian number fields. Thus the book is addressed primarily to students with algebraic interests, as seminar material. Specialists also will find in it a multitude of examples of polynomials with special Galois groups, which can of course also be used for the usual algebra courses.

**Differential equations and mathematical physics.** — Proceedings of an International Conference held in Birmingham, Alabama, USA, March 3-8, 1986. — I.W. Knowles, Y. Saito, editors. — Lecture notes in mathematics, vol. 1285. — Un vol. broché,  $16 \times 24,5$ , de xvi, 499 p. — Prix: DM 80.00. — Springer-Verlag, Berlin, 1987.

The meeting was attended by about 250 mathematicians from 22 countries. The papers in this volume all involve new research material, with at least outline proofs. Some papers also contains survey material. Topics covered include: Schrödinger theory, scattering and inverse scattering, fluid mechanics (including conservative systems and inertial manifold theory attractors), elasticity, non-linear waves, and feedback control theory.

**Algebraic topology.** — Proceedings of a Workshop held at the University of Washington, Seattle, 1985. — H.R. Miller, D.C. Ravenel, editors. — Lecture notes in mathematics, vol. 1286. — Un vol. broché,  $16 \times 24,5$ , de vii, 341 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1987.

This workshop was held during Winter and Spring of 1985 at the University of Washington. Four topics courses were offered: Doug Ravenel: Im  $J$  and the *EHP* sequence. — Emmanuel Dror Farjoun: Homotopy and homology theory for diagrams of spaces. — Fred Cohen: Some aspects of classical homotopy theory. — Marc Mahowald: The Kervaire invariant. This volume offers contributions by M.G. Barrat, C.-F. Bödigheimer, F.R. Cohen, R.L. Cohen, E.B. Curtis, D.M. Davis, E. Dror Farjoun, P. Goerss, J.D.S. Jones, N.-J. Kuhn, M.E. Mahowald, J.E. Milgram, W.M. Singer, R.D. Thompson.

**Approximation theory, Tampa.** — Proceedings of a Seminar held in Tampa, Florida, 1985-1986. — E.B. Saff, editor. — Lecture notes in mathematics, vol. 1287. — Un vol. broché,  $16 \times 24,5$ , de V, 228 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1987.

The main theme is approximation theory (particularly polynomial and rational approximation and interpolation in the complex plane), but several contributions deal with numerical methods (such as an algorithm for solving a special case of Kalman's partial realisation problem, and methods for computing eigenvalues and eigenfunctions of the Laplacian) and further two papers consider the asymptotic behaviour of extremal polynomials associated with weights on a finite and on an infinite interval.

**K-theory, arithmetic and geometry.** — Seminar, Moscow University, 1984-1986. — Yu. I. Manin, editor. — Lecture notes in mathematics, vol. 1289. — Un vol. broché,  $16 \times 24,5$ , de v, 399 p. — Prix: DM 65.00. — Springer-Verlag, Berlin, 1987.

Height pairing between algebraic cycles. — On the derived category of perverse sheaves. — How to glue perverse sheaves. — Sheaves of the Virasoro and Neveu-Schwarz algebras. Additive  $K$ -theory. — Cyclic homology of algebras with quadratic relations, universal enveloping algebras and group algebras. — On homotopy limit of homotopy algebras. — On the delooping of Chern character and Adams operations. — Noncommutative residue, fundamentals.

Jürgen JOST. — **Nonlinear methods in Riemannian and Kählerian geometry: delivered at the German Mathematical Society Seminar in Düsseldorf in June, 1986.** — DMV Seminar, Bd. 10. — Un vol. broché,  $17 \times 24$ , de 153 p. — Prix: SFr. 38.00. — Birkhäuser Verlag, Basel, 1988.

Geometric preliminaries. — Some principal of analysis. — The heat flow on manifolds. Existence and uniqueness of harmonic maps into nonpositively curved image manifolds. — The parabolic Yang-Mills equation. — Geometric applications of harmonic maps.

Louis H. KAUFFMAN. — **On knots.** — Annals of mathematics studies, vol. 115. — Un vol. relié,  $15,5 \times 24,5$ , de xv, 480 p. — Princeton University Press, Princeton, N.J., 1987.

Linking numbers and Reidemeister moves. — The Conway polynomial. — Examples and Skein theory. — Detecting slices and ribbons: a first pass. — Miscellany (The last sections of this chapter contain an exposition of the author's geometric musings on the first generalized polynomial which is a powerful invariant that generalizes the classical Alexander and Conway polynomials). — Spanning surfaces and Seifert pairing. — Ribbons and slices. Alexander polynomial and branched coverings. — Alexander polynomial and Arf invariant. — Free differential calculus. — Cyclic branched coverings. — Signature theorems. —  $G$ -signature theorem for four-manifolds. — Signature of cyclic branched coverings. — An invariant for coverings. — Slice knots. — On generalized Stevedore's knots. — Singularities, knots and Brieskorn varieties. — Generalized polynomials and a state model for the Jones polynomial. — Tables: Knot tables and the  $L$ -polynomial.

**Nonlinear hyperbolic problems.** — C. Carasso, P.-A. Raviart, D. Serre, editors. — Lecture notes in mathematics, vol. 1270. — Un vol. broché,  $16,5 \times 24$ , de xv, 341 p. — Prix: DM 57.50. — Springer-Verlag, Berlin, 1987.

This field has been expanding very fast over the past years, and has applications in aerodynamics, multifluid flows, combustion, detonics, amongst other. The papers in this volume of proceedings deal to a greater extent with theoretical problems emerging in the resolution of nonlinear hyperbolic systems than with numerical methods. The volume provides an up-to-date review of the current research trends.

**Invariant theory.** — Edited by S.S. Koh. — Lecture notes in mathematics, vol. 1278. — Un vol. broché,  $16,5 \times 24$ , de v, 102 p. — Prix: DM 23.00. — Springer-Verlag, Berlin, 1987.

Klaus Pommerening: Invariants of unipotent groups, a survey. — Edward Formanek: The invariants of  $n \times n$  matrices. — Alain Lascoux: Forme canonique d'une forme binaire. — Joseph P.S. Kung: Canonical forms for binary forms of even degrees. — Peter J. Olver: Invariant theory and differential equations. — George R. Kempf: Computing invariants. — Frank D. Grosshans: Constructing invariant polynomials via Tschirnhaus transformations.

Yuri L. RODIN. — **Generalized analytic functions on Riemann surfaces.** — Lecture notes in mathematics, vol. 1288. — Un vol. broché,  $16,5 \times 24$ , de v, 128 p. — Prix: DM 23.00. — Springer-Verlag, Berlin, 1987.

The author has contributed significantly to the theory of the Bers-Vekua-Carleman equation on Riemann surfaces which is presented in book form for the first time. No preliminary knowledge of Riemann surfaces and algebraic topology is required: the book is written primarily for specialists in complex analysis, differential equations and mathematical physics.

**Random graphs '85.** — Based on lectures presented at the 2nd International Seminar on Random Graphs and Probabilistic Methods in Combinatorics, August 5-9, 1985, organized and sponsored by the Institute of Mathematics, Adam Mickiewicz University, Poznan, Poland. — Edited by Michal Karonski and Zbigniew Palka. — North-Holland mathematics studies, vol. 144. — Annals of discrete mathematics, vol. 33. — Un vol. broché,  $17 \times 24$ , de VII, 354 p. — Prix: Dfl. 185.00. — North-Holland, Amsterdam, 1987.

Covering a wide range of random graphs subjects, this volume examines series-parallel networks, properties of random subgraphs of the  $n$ -cube, random binary and recursive trees, random digraphs, induced subgraphs and spanning trees in random graphs as well as matchings, Hamiltonian cycles and closure in such structures, various aspects of percolation theory and its applications, properties of random lattices and random walks on graphs, random allocation schemes, pseudo-random graphs and reliability of planar networks.

José Maria MONTESINOS. — **Classical tessellations and three-manifolds.** — With 225 figures including 29 colour illustrations. — Universitext. — Un vol. broché,  $16,5 \times 24$ , de XVII, 230 p. — Prix: DM 58.00. — Springer-Verlag, Berlin, 1987.

In his original and entertaining style and with numerous exercises and problems, the author introduces the reader to Seifert manifolds, classical tessellations, quaternions, and rotations, orbifolds, 3-manifolds, branched coverings, etc. Graduate students will find in it a source of geometrical insight to low-dimensional topology. Researchers will find much that they already know clothed in a new garb — the framework of orbifolds — and will be able to use the text as a source of geometrical ideas for a low-dimensional topology seminar.

Krzysztof P. RYBAKOWSKI. — **The homotopy index and partial differential equations.** — Universitext. — Un vol. broché,  $16,5 \times 24$ , de XII, 208 p. — Prix: DM 69.00. — Springer-Verlag, Berlin, 1987.

The book presents an extension, due to the present author, of Conley's homotopy index theory to certain (one-sided) semiflows on general (not necessarily locally compact) metric spaces. This permits direct applications to say, parabolic partial differential equations, or functional differential equations. The presentation is self-contained.

S. GALLOT, D. HULIN, J. LAFONTAINE. — **Riemannian geometry.** — Universitext. — Un vol. broché,  $16,5 \times 24$ , de XI, 248 p. — Prix: DM 48.00. — Springer-Verlag, Berlin, 1987

This book, based on a graduate course on Riemannian geometry and analysis on manifolds, held in Paris, covers the topics of differential manifolds, Riemannian metrics, connections, geodesics and curvature, with special emphasis on the intrinsic features of the subject. Classical results on the relations between curvature and topology are treated in detail. This book contains numerous exercises with full solutions and a series of detailed examples which are picked up repeatedly to illustrate each new definition or property introduced.

C.S. HSU. — **Cell-to-cell mapping: a method of global analysis for nonlinear systems.** — Applied mathematical sciences, vol. 64. — Un vol. relié,  $16,5 \times 24,5$ , de XII, 352 p. — Prix: DM 98.00. — Springer-Verlag, New York, 1987.

The methods of cell-to-cell mapping are believed to provide a new framework of global analysis for nonlinear systems. They are based upon the idea of discretizing a continuum state space into cells, and casting the evolution of a system in the form of a cell-to-cell mapping. Up to now, two kinds of cell-mapping, simple and generalized, have been introduced. Generalized



cell-mapping is particularly attractive because it can deal not only with fractally dimensioned entities of deterministic systems, but also with stochastic systems.

Sidney I. RESNICK. — **Extreme values, regular variation, and point processes.** — Applied probability, vol. 4. — Un vol. relié, 16,5 × 24, de XII, 320 p. — Prix: DM 145.00. — Springer-Verlag, New York, 1987.

This book is primarily concerned with the behavior of extreme values of independent, identically distributed observations. The treatment is organized around two themes. The first is that the central analytic tool of extreme value theory is the theory of regularly varying functions, and the second is that the central probabilistic tool is point process theory and in particular the Poisson process. Accordingly, this text presents a careful exposition of those aspects of regular variation and point processes which are essential for a proper understanding of extreme value theory.

Dieter HAPPEL. — **Triangulated categories in the representation theory of finite dimensional algebras.** — London Mathematical Society Lecture Note Series, vol. 119. — Un vol. broché, 15,5 × 23, de IX, 208 p. — Prix: £ 13.95. — Cambridge University Press, Cambridge, 1988.

In this work, the author shows that derived categories of finite-dimensional algebras are a useful tool in studying tilting processes. Results on the structure of derived categories of hereditary algebras are used to investigate Dynkin algebras and iterated tilted algebras. The author shows how triangulated categories arise naturally in the study of Frobenius categories. The study of trivial extension algebras and repetitive algebras is then developed using the triangulated structure on the stable category of the algebra's module category.

Dragos M. CVETKOVIC; Michael DOOB; Ivan GUTMAN; Aleksandar TORGASEV. — **Recent results in the theory of graph spectra.** — Annals of discrete mathematics, vol. 36. — Un vol. relié, 16,5 × 24, de XI, 306 p. — Prix: US\$97.25 / Dfl. 185.00. — North-Holland Publishing Co., Amsterdam, 1988.

The purpose of this volume is to review the results in spectral graph theory which have appeared since 1978. *From the contents:* Characterizations of graphs by their spectra. Distance-regular and similar graphs. The matching polynomial and other graph polynomials. Applications to chemistry and other branches of science. Spectra of infinite graphs.

Friedrich HIRZEBRUCH. — **Gesammelte Abhandlungen - Collected papers.** — 2 vol. reliés, 17 × 25, de VIII, 814 et IV, 818 p. — Prix: DM 348.00. — Springer-Verlag, Berlin, 1987.

Diese beiden Bände enthalten fast alle wissenschaftlichen Arbeiten von Friedrich Hirzebruch aus den Jahren 1951 bis 1987, einschliesslich seines Buches "Neue topologische Methoden in der Geometrie" und den mit Koautoren geschriebenen Veröffentlichungen. Darüber hinaus sind auch sieben bisher unveröffentlichte Arbeiten abgedruckt, wie auch bis jetzt nur schwer zugängliches Material. Dies wird begleitet von einem ausführlichen, von F.H. Hirzebruch verfassten Kommentarteil, in dem Entstehung, Entwicklung und aktueller Stand der von ihm bearbeiteten Probleme diskutiert werden.

Daniel H. FREEMAN, Jr. — **Applied categorical data analysis.** — Statistics: textbooks and monographs, vol. 79. — Un vol. relié, 15,5 × 23,5, de XI, 318 p. — Prix: US\$83.50 (countries other than U.S. and Canada). — Marcel Dekker, New York, 1987.

This introduction to log-linear models, weighted least squares, and logistic regression includes coverage of techniques both for small samples and for large survey samples, while using real-world examples from the fields of medicine, public health, epidemiology, political science, sociology, anthropology and geography. In addition, the book covers specialized techniques such as analyzing for quasi-independence and decomposition of chi-square and elucidates collapsibility theorems and their implications.

**Proceedings of the Analysis Conference, Singapore 1986.** — Edited by Stephen T.L. Choy, Judith P. Jesudason, and P.Y. Lee. — North-Holland mathematics studies, vol. 150. — Un vol. broché,  $16,5 \times 24$ , de XII, 304 p. — Prix: Dfl. 175.00. — North-Holland, Amsterdam, 1988.

The main emphasis of this volume is on harmonic analysis and functional analysis. The papers include some of the latest research developments in this important field of mathematics. Included are papers on current research in Fourier analysis, the theory of pseudo-differential operators and Banach space theory.

Jack Carl KIEFER. — **Introduction to statistical inference.** — Edited by Gary Lorden. — Springer texts in statistics. — Un vol. relié,  $16 \times 24$ , de VIII, 334 p. — Prix: DM 98.00. — Springer-Verlag, New York, 1987.

This book is based on lecture notes developed by the late Jack Kiefer for a course on statistical inference which he taught at Cornell University. Kiefer's approach is to present the central ideas of the modern theory of statistical inference with a minimum of formality, relying on a mixture of examples, pictures and mathematical derivations to complement a clear logical discussion of the important ideas.

T.W. KOERNER. — **Fourier analysis.** — Un vol. relié,  $18 \times 25,5$ , de XII, 591 p. — Prix: £60.00 / US\$95.00. — Cambridge University Press, Cambridge, 1988.

Fourier analysis is a subject that was born in physics but grew up in mathematics. Now it is part of the standard repertoire for mathematicians, physicists and engineers. In most books, this diversity of interests is often ignored, but here Dr. Körner has provided a shop-window for some of the ideas, techniques and elegant results of Fourier analysis, and for their applications. These range from number theory, numerical analysis, control theory and statistics, to geology, astronomy, and engineering.

A. EL JAI, A.J. PRITCHARD. — **Sensors and controls in the analysis of distributed systems.** — Mathematics and its applications. — Un vol. relié,  $17 \times 25$ , de 125 p. — Prix: £25.00. — John Wiley/Ellis Horwood, Chichester, 1988.

This book presents the principle results in the analysis of distributed parameter systems which are concerned with the structure of the input and output operators, i.e. controls and sensors. It introduces notions of controllability, observability, stabilization and detectability, and shows how it may be possible to achieve these properties by suitable placement and/or shaping of the sensors and controls.

Robin HARTE. — **Invertibility and singularity for bounded linear operators.** — Pure and applied mathematics, vol. 109. — Un vol. relié,  $16 \times 23,5$ , de XII, 590 p. — Prix: US\$119.50 (countries other than U.S. and Canada). — Marcel Dekker, New York, 1988.

The book makes its presentation around three major theorems and two constructions, including the open mapping theorem, the Hahn-Banach theorem, the enlargement of a normed

space, Liouville's theorem. This new approach to elementary functional analysis extends from the definition of a normed space to the fringe of modern multiparameter spectral theory.

N. BOURBAKI. — **Elements of mathematics: Topological vector spaces, chapters 1-5.** — Translated by H.G. Eggleston and S. Madan. — Un vol. relié, 18 × 24,5, de VII, 365 p. — Prix: DM 148.00. — Springer-Verlag, Berlin, 1987.

This book is the English translation of the new and expanded version of Bourbaki's "Espaces vectoriels topologiques". It addresses all mathematicians and physicists interested in a structural presentation of contemporary mathematics.

**Encyclopedia of statistical sciences, Vol. 8: Regressograms to St. Peterburg Paradox, The.** — Editors-in-chief: Samuel Kotz and Norman L. Johnson; Executive editor: Campbell B. Read. — Un vol. relié, 19 × 26, de X, 870 p. — Prix: £99.00. — John Wiley, New York, 1988.

This essential reference work on statistical methods and their application to virtually all facets of human endeavor aims to provide sound information and practical guidance for readers who may not be specialists in a particular topic.

In-depth, exhaustive coverage of the philosophical foundations, theoretical bases, and computational techniques of statistical methods is provided. The contributions are authored by distinguished statisticians and are new and up-to-date.

Jean-Louis JARDIN. — **Algèbre: algorithmes et programmes en Pascal.** — Un vol. broché, 18 × 21, de X, 245 p. — Prix: FF 110.00. — Dunod, Paris, 1988.

L'ouvrage présente un ensemble de méthodes relevant de l'algèbre numérique élémentaire et leur mise en oeuvre dans un langage de programmation de haut niveau: le Pascal. Les sous-programmes permettant d'effectuer les calculs en arithmétique complexe sont décrits dans l'appendice. Le dialecte Pascal employé est le Turbo Pascal. Les informations requises pour opérer la conversion des programmes dans d'autres dialectes (MS-Pascal ou Pascal UCSD) figurent dans l'annexe.

S.J. PATTERSON. — **An introduction to the theory of the Riemann zeta-function.** — Cambridge studies in advanced mathematics, vol. 14. — Un vol. relié, 15,5 × 23,5 de XIII, 156 p. — Prix: £20.00/US\$34.50. — Cambridge University Press, Cambridge, 1988.

This is a modern introduction to the analytic techniques used in the investigation of zeta-functions through the example of the Riemann zeta-function. Riemann introduced this function in connection with his study of prime numbers, and from this has developed the subject of analytic number theory. Since then, many other classes of "zeta-function" have been introduced and they are now some of the most intensively used studied objects in number theory.

Underwood DUDLEY. — **A budget of trisections.** — Un vol. relié, 16 × 24, de XV, 169 p. — Prix: DM 58.00. — Springer-Verlag, New York, 1987.

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, to amuse the reader, and, perhaps most importantly, to reduce the number of trisectors. Detailed information is included about the personalities of trisectors and their constructions.



Neal KOBLITZ. — **A course in number theory and cryptography.** — Graduate texts in mathematics, vol. 114. — Un vol. relié,  $16 \times 24$ , de VIII, 208 p. — Prix: DM 74.00. — Springer-Verlag, New York, 1987.

The purpose of this book is to introduce the reader to arithmetic topics, both ancient and modern, which have been at the center of interest in applications of number theory, particularly in cryptography. A special feature is the inclusion of recent applications of the theory of elliptic curves.

U. GRAF, H.-J. HENNING, K. STANGE, P.-T. WILRICH. — **Formeln und Tabellen der Angewandten mathematischen Statistik.** — 3., völlig neue bearbeitete Auflage von P.-Th. Wilrich und H.-J. Henning. — Un vol. relié,  $17 \times 25$ , de XVII, 529 p. — Prix: DM 198.00. — Springer-Verlag, Berlin, 1987.

Das Buch stellt in dritter Auflage die wichtigsten, einschlägigen Verfahren für die Praxis der mathematisch-statistischen Arbeit zusammen. Dabei werden für die einzelnen Methoden jeweils nur die Grundlagen, die benötigten Formeln und evtl. erforderliche Tabellen oder Nomogramme wiedergegeben, ohne dass auf Beweisführung oder Ableitung eingegangen wird.

**Essays in group theory.** — Editor: S.M. Gersten. — Mathematical Sciences Research Institute Publications, vol. 8. — Un vol. relié,  $16 \times 24,5$ , de VII, 342 p. — Prix: DM 64.00. — Springer-Verlag, New York, 1987.

This book contains 5 papers on topics of current interest which were presented in a seminar at MSRI, Berkeley, in June 1985. Their authors are: G. Baumslag and P.B. Shalen, S.M. Gersten, M. Gromov, P.B. Shalen and J.R. Stallings. Special mention should be given to Gromov's paper, one of the most significant in the field in the last decade.

Alain ROBERT. — **Nonstandard analysis.** — Translated and adapted by the author. — Un vol. relié,  $15,5 \times 23,5$ , de XX, 156 p. — Prix: £14.95. — John Wiley, New York, 1988.

This book is a short, readable introduction to the subject of nonstandard analysis, based on the axiomatic or IST approach. The first part gives a clear, rigorous exposition of the theory; the second part consists of a number of self-contained chapters dealing with applications.

Arnold F. NIKIFOROV, Vasilii B. UVAROV. — **Special functions of mathematical physics: a unified introduction with applications.** — Translated from the Russian by Ralph P. Boas. — Un vol. relié,  $17,5 \times 24$ , de XVIII, 427 p. — Prix: SFr. 168.00. — Birkhäuser-Verlag, Basel, 1988.

This presentation of the most important special functions is developed from a unified, simple point of view, based on a single formula, the Rodrigues formula. The volume takes a unified approach to the whole family of special functions and is the most comprehensive treatment yet available in book form, with a considerable amount of very recent material on orthogonal polynomials of a discrete variable and some of their applications in physics.

Adhemar BULTHEEL. — **Laurent series and their Padé approximations.** — Operator theory: advances and applications, vol. 27. — Un vol. relié,  $17 \times 24$ , de XI, 274 p. — Prix: SFr. 88.00. — Birkhäuser Verlag, Basel, 1987.

The main part of this monograph is purely algebraic. It studies algebraic properties and algorithms for the computation of Laurent-Padé approximants for formal power series. This is a two-sided extension of the classical Padé approximation problem which treats only one

sided power series. Related topics like continued fractions, orthogonal polynomials, quadrature, Toeplitz matrix factorization and inversion are treated.

**Combinatorics '86.** — Proceedings of the International Conference on Incidence Geometries and Combinatorial Structures, Passo della Mendola, Trento, Italy, 30 June - 5 July, 1986. — Edited by A. Barlotti, M. Marchi, G. Tallini. — Annals of discrete mathematics, vol. 37. — Un vol. broché,  $16,5 \times 24$ , de xvi, 502 p. — Prix: Dfl. 240.00. — North-Holland, Amsterdam, 1988.

Recent developments in all aspects of combinatorial and incidence geometry are covered in the 56 papers in this volume, including their links with the foundations of geometry, graph theory and algebraic structures, and the applications to coding theory and computer science.

JANOS BOLYAI. — **Appendix: the theory of space, with introduction, comments and addenda.** — Edited by Ferenc Karteszi, with supplement by Barna Szénassy. — North-Holland mathematics studies, vol. 138. — Un vol. broché,  $16,5 \times 24$ , de 240 p. — Prix: Dfl. 190.00. — North-Holland, Amsterdam, 1987.

The epoch-making work of Janos Bolyai is presented here, together with a supplement outlining Hungarian political and science history to help the reader to get acquainted with the miserable fate of Janos Bolyai and with his intellectual world. A facsimile of a copy of Bolyai's original 1831 *Scientia Spatii* (also known as the Appendix) is included, together with a translation. Comments and notes, and a survey of the effects of his work, complete the volume.

Z. DITZIAN, V. TOTIK. — **Moduli of smoothness.** — Springer series in computational mathematics, vol. 9. — Un vol. relié,  $16 \times 24$ , de ix, 227 p. — Prix: DM 108.00. — Springer-Verlag, New York, 1987.

The book introduces a new way of measuring smoothness. The need for this new concept arises from the failure of the classical moduli of smoothness to solve some basic problems. The new modulus, which has a simple form, can also be described as a Peetre  $K$  functional between an  $L_p$  space and a weighted Sobolev space. Connections between interpolation of spaces and approximation theory are utilized in applying the modulus of smoothness. Special emphasis is placed on the computability aspect of the moduli. The results are new, and complete proofs are given.

G.H. HARDY, J.E. LITTLEWOOD, G. POLYA. — **Inequalities.** — Reprint from the 2nd edition. — Cambridge mathematical library (paperback edition). — Un vol. relié,  $15,5 \times 23,5$ , de xii, 324 p. — Prix: £27.50 (broché: £12.50). — Cambridge University Press, Cambridge, 1988.

This classic of the mathematical literature forms a comprehensive study of the inequalities used throughout mathematics. First published in 1934 it presents clearly and exhaustively both the statement and proof of all the standard inequalities of analysis. This book had an impact on the trend of research and is still influencing it.

**New directions in dynamical systems.** — Edited by T. Bedford and J. Swift. — London Mathematical Society lecture note series, vol. 127. — Un vol. broché,  $15,5 \times 22,5$ , de xiii, 283 p. — Cambridge University Press, Cambridge, 1988.

Each paper of this book is intended to provide both an overview of a specific area and an introduction to new ideas and techniques. The authors have been encouraged to include a selec-

tion of open questions as a spur to further research. Topics covered include global bifurcations in chaotic o.d.e.s., knotted orbits in differential equations, bifurcations with symmetry, renormalisation and universality, and one-dimensional dynamics.

A. ZYGMUND. — **Trigonometric series.** — 2nd edition, volumes 1 and 2 combined. — Cambridge mathematical library. — Un vol. broché,  $15,5 \times 22,5$ , de XIII, 383, IV, 364 p. — Prix: £25.00. — Cambridge University Press, Cambridge, 1988.

The first edition of this book published in Warsaw in 1935, established itself as a classic. It presented a concise account of the main results then known, but was on a scale which limited the amount of detailed discussion possible. A greatly enlarged second edition published by Cambridge in two volumes in 1959 took full account of developments in trigonometric series, Fourier series and related branches of pure mathematics. The two volumes are here bound together.

Yurii A. ROZANOV. — **Introduction to random processes.** — Translated from the Russian by Birgit Röthinger. — Springer series in Soviet mathematics. — Un vol. relié,  $16 \times 23,5$ , de VIII, 117 p. — Prix: DM 54.00. — Springer-Verlag, Berlin, 1987.

Today, the theory of random processes represents a large field of mathematics with many different branches. This book applies mathematical models that are simple, but that have some importance for applications. The book starts with a treatment of homogeneous Markov processes with a countable number of states. The main topics are the ergodic theorem, the method of Kolmogorov's differential equations and Brownian motion. The chapters that follow outline the foundations of stochastic analysis.

Jean-Pierre SERRE. — **Complex semisimple Lie algebras.** — Translated from the French by G.A. Jones. — Un vol. broché,  $15,5 \times 23,5$ , de IX, 74 p. — Prix: DM 39.80. Springer-Verlag, New York, 1987.

These short notes give the basic theory of semisimple Lie algebras over the complex numbers, including the classification theorem. The author begins with a summary of the general properties of nilpotent, solvable, and semisimple Lie algebras. Subsequent chapters introduce Cartan subalgebras, root systems, and linear representations. The last chapter discusses the connection between Lie algebras, complex and compact groups.

Bernard MASKIT. — **Kleinian groups.** — Grundlehren der mathematischen Wissenschaften, vol. 287. — Un vol. relié,  $16 \times 24$ , de XIII, 326 p. — Prix: DM 128.00. Springer-Verlag, Berlin, 1988.

The first part of the book is a comprehensive introduction to the geometric and topological structure of Kleinian groups. The book starts with Möbius transformations acting on the complex plane and continues with discontinuous groups and limit sets, specifically on plane domains, and covering space theory. The next chapter concerns discrete groups of hyperbolic isometries in  $n$ -space. This part ends with a discussion of the basic groups. The second part treats more advanced topics. There is a discussion of geometrically finite groups, new and complete statements and proofs of the Klein-Maskit combination theorems, and a collection of examples. There is then a discussion of  $B$ -groups and function groups including the topological classification of geometrically finite function groups, and its applications.

V.V. NIKULIN, I.R. SHAFAREVICH. — **Geometries and groups.** — Translated from the Russian by M. Reid. — Universitext. — Un vol. broché,  $16,5 \times 24$ , de VIII, 251 p. — Prix: DM 58.00. — Springer-Verlag, Berlin, 1987.

This is a quite exceptional book in which an important field of mathematics is treated in a masterly manner that is both lively and approachable. Each stage of the development is carefully motivated by discussion of physical, general scientific and also philosophical implications of the mathematical argument. The book will hopefully soon be considered as a classic.

**Wave motion: theory, modelling, and computation.** — Proceedings of a conference in honor of the 60th birthday of Peter D. Lax. — Alexandre J. Chorin, Andrew J. Majda, editors. — Mathematical sciences research institute publications, vol. 7. — Un vol. relié,  $16 \times 24$ , de x, 336 p. — Prix: DM 69.00. — Springer-Verlag, New York, 1987.

Lattice vortex models and turbulence theory. — The curve shortening flow. — Lax's construction of parametrices of fundamental solutions of strongly hyperbolic operators, its prehistory and posthistory. — The Bukiet-Jones theory of weak detonation waves in curvilinear geometry. — Three-dimensional fluid dynamics in a two-dimensional amount of central memory. — On the nonlinearity of modern shock-capturing schemes. — High frequency semilinear oscillations. — Exact controllability and singular perturbations. — Transonic flow and compensated compactness. — Scattering theory for the wave equation on a hyperbolic manifold. — Determinants of Laplacians on surfaces. — The small dispersion limit of the Korteweg-de Vries equation.

**Diophantine approximation and transcendence theory.** — Seminar, Bonn (FRG), May-June 1985. — Lecture notes in mathematics, vol. 1290. — Un vol. broché,  $16,5 \times 24$ , de v, 243 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1987.

J.L. Colliot-Thélène, D. Kanevsky, J.J. Sansuc: Arithmétique des surfaces cubiques diagonales. — D.W. Masser: Small values of heights on families of Abelian varieties. — W.D. Brownawell: Large transcendence degree revisited, I, exponential and non-CM cases, and II, (with R. Tubbs): the CM-case. — G. Wüstholz: A new approach to Baker's theorem on linear forms in logarithms, I, II. — E. Bombieri: On the Thue-Mahler equation.

Colette MOEGLIN, Marie-France VIGNERAS, Jean-Loup WALDSPURGER. — **Correspondances de Howe sur un corps p-adique.** — Lecture notes in mathematics, 1291. — Un vol. broché,  $16,5 \times 24$ , de VII, 163 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

Espaces hermitiens. — Représentations métaglectiques et conjecture de Howe. — Correspondance de Howe et induction. — Sur les classes de conjugaison dans certains groupes unitaires. — Paires réductives duales non ramifiées. — Représentations de petit rang du groupe symplectique.

Wolfgang EBELING. — **The monodromy groups of isolated singularities of complete intersections.** — Lecture notes in mathematics, vol. 1293. — Un vol. broché,  $16,5 \times 24$ , de XIV, 153 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

This research monograph provides a detailed and systematic study of some fundamental discrete invariants of isolated singular points of complete intersections. These invariants include the intersection form on a Milnor fibre, the monodromy group, the vanishing cycles, and the Coxeter-Dynkin diagrams of such a singularity. Special attention is devoted to non-hypersurface singularities. Most of the material applying to the non-hypersurface case is new and previously unpublished.

Martine QUEFFELEC. — **Substitution dynamical systems: spectral analysis.** — Lecture notes in mathematics, vol. 1294. — Un vol. broché,  $16,5 \times 24$ , de XIII, 240 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1987.

This research monograph provides a complete description of the spectrum of a dynamical system arising from substitutions of constant length. In order to make the topic accessible, all background results required are proved and the beginning of the book concentrates on classical spectral theory of unitary operators and dynamical systems. To describe the maximal spectral type and the spectral multiplicity of substitution of constant length, matrices of measures have to be considered and reduced to diagonal form. An attractive feature is the explicit computation of spectral invariants, giving rise, for Rudin-Shapiro substitution, to a 2-fold Lebesgue component.

**Séminaire d'analyse P. Lelong - P. Dolbeault - H. Skoda, années 1985-1986.** — P. Lelong, P. Dolbeault, H. Skoda, rédacteurs. — Lecture notes in mathematics, vol. 1295. — Un vol. broché,  $16,5 \times 24$ , de VII, 283 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1987.

This new volume of the "Séminaire" deals with recent progress in complex analysis and analytic geometry. The main topics are differential geometry of line bundles on compact manifolds, fiber bundles, residual currents, asymptotic expansions related to integration on fibers, integral representations on Stein manifolds and convolution operators. A new and interesting subject is the analysis connected with non-commutative algebra of Feynmann operators.

**Séminaire d'algèbre Paul Dubreil et Marie-Paule Malliavin.** — Proceedings, Paris, 1986. — Lecture notes in mathematics, vol. 1296. — Un vol. broché,  $16,5 \times 24$ , de IV, 328 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1987.

These proceedings reflect the main activities of the "Dubreil-Malliavin Seminar" in 1986 in a series of 14 papers on invariant theory, ring theory, differential operators, homological algebra. In eight of the papers new original research results are presented. The other 6 contributions are survey articles.

**Algebraic topology, Barcelona, 1986.** — Proceedings of a symposium held in Barcelona, April 2-8, 1986. — J. Aguadé, R. Kane, editors. — Lecture notes in mathematics, vol. 1298. — Un vol. broché,  $16,5 \times 24$ , de X, 255 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1987.

*From the contents:* M. Audin: Classes caractéristiques Lagrangiennes. — A. Baker: Combinatorial and arithmetic identities based on formal group laws. — M.C. Crabb: On the stable splitting of  $U(n)$  and  $\Omega U(n)$ . — E. Dror Farjoun, A. Zabrodsky: The homotopy spectral sequence for equivariant functions complexes, etc...

**Numerical methods for partial differential equations.** — Proceedings of a Conference held in Shanghai, P.R. China, March 25-29, 1987. — Zhu You-lan, Guo Ben-yu, eds. — Lecture notes in mathematics, vol. 1297. — Un vol. broché,  $16 \times 24,5$ , de XI, 244 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1987.

These proceedings of the first Chinese Conference on Numerical Methods for Partial Differential Equations covers topics such as difference methods, finite element methods, spectral methods, splitting methods, parallel algorithm, etc..., their theoretical foundation and applications to engineering. Numerical methods both for boundary value problems of elliptic equations and for initial-boundary value problems of evolution equations, such as hyperbolic systems and parabolic equations, are involved.



Marcel BERGER, Bernard GOSTIAUX. — **Differential geometry: Manifolds, curves, and surfaces.** — Translated from the French by Silvio Levy. — Graduate texts in mathematics, vol. 115. — Un vol. relié, 16 × 24,5, de XII, 474 p. — Prix: DM 98.00. — Springer-Verlag, New York, 1988.

This book is an introduction to modern differential topology. The authors begin with the necessary tools from analysis and topology, including Sard's theorem, de Rham cohomology, calculus on manifolds, and a degree theory. The general theory is illustrated and expanded using the examples of curves and surfaces. In particular, the book contains the classical local and global theory of surfaces, including the fundamental forms, curvature, the Gauss-Bonnet formula, geodesics, and minimal surfaces.

J.H. CONWAY, N.J.A. SLOANE. — **Sphere packings, lattices and groups.** — With additional contributions by E. Bannai, J. Leech, S.P. Norton, A.M. Odlyzko, R.A. Parker, L. Queen and B.B. Venkov. — Grundlehren der mathematischen Wissenschaften, vol. 290. — Un vol. relié, 16,5 × 24, de XXVII, 663 p. — Prix: DM 178.00. — Springer-Verlag, New York, 1988.

This book is an exposition of the mathematics arising from the theory of sphere packings. Considerable progress has been made on the basic problems in the field, and the most recent research is presented here. Connections with many areas of pure and applied mathematics, for example signal processing, coding theory, are thoroughly discussed. The main themes covered are: packing spheres in Euclidean space of dimensions 1,2,3,4,5..., the kissing number problem, the covering problem, the quantizing problem, the classification of quadratic forms, the E8 and Leech lattices, error correcting codes, Steiner systems, and  $t$ -designs, finite groups, sporadic simple groups, the Monster or Friendly Giant simple group.

Jean JACOD, Albert N. SHIRYAEV. — **Limit theorems for stochastic processes.** — Grundlehren der mathematischen Wissenschaften, vol. 288. — Un vol. relié, 16,5 × 24, de XVII, 601 p. — Prix: DM 198.00. — Springer-Verlag, Berlin, 1987.

The authors of this volume propose a systematic exposition of convergence in law for stochastic processes, from the point of view of semimartingale theory, with emphasis on results that are useful for mathematical theory and mathematical statistics. This leads them to develop in detail some particularly useful parts of the general theory of stochastic processes, such as martingale problems, and absolute continuity or contiguity results.

Tadao ODA. — **Convex bodies and algebraic geometry: an introduction to the theory of toric varieties.** — Ergebnisse der Mathematik und ihrer Grenzgebiete, 3. Folge, Bd. 15. — Un vol. relié, 17 × 25, de VIII, 212 p. — Prix: DM 148.00. — Springer-Verlag, Berlin, 1987.

This book is a unified up-to-date survey of the various results and interesting applications found since toric varieties were introduced in the early 1970's. Toric varieties are here treated as complex analytic spaces. The author shows how elementary convex figures give rise to interesting complex analytic spaces. Easily visualized convex geometry is then used to describe algebraic geometry for these spaces, such as line bundles, projectivity, automorphism groups, birational transformations, differential forms and Mori's theory. Conversely, the algebraic geometry of toric varieties gives new insight into continued fractions as well as their higher-dimensional analogues, the isoperimetric problem and other questions on convex bodies. Relevant results on convex geometry are collected.

Gerard VAN DER GEER. — **Hilbert modular surfaces.** — Ergebnisse der Mathematik und ihrer Grenzgebiete, 3. Folge, Bd. 16. — Un vol. relié, 17 × 25, de IX, 291 p. — Prix: DM 148.00. — Springer-Verlag, Berlin, 1988.

Over the last 15 years important results have been achieved in the field of Hilbert modular spaces. So main emphasis of this book is on the geometry of Hilbert modular surfaces, and both geometric and arithmetic aspects are treated. An abundance of examples, in fact a whole chapter, completes this presentation of the subject.

Tullio VALENT. — **Boundary value problems of finite elasticity: local theorems on existence, uniqueness, and analytic dependance on data.** — Springer tracts in natural philosophy, vol. 31. — Un vol. relié, 16 × 24, de XII, 191 p. — Prix: DM 124.00. — Springer-Verlag, New York, 1988.

The object of this book is the systematic exposition of recent work of the author's on boundary value problems of finite elasticity. These results concern an  $n$ -dimensional generalization of the three-dimensional elasticity which, aside from leading to a great many interesting mathematical situations, often shed light on certain aspects of the three-dimensional case.

**Dynamical systems, III.** — V.I. Arnold, ed. — With contributions by V.I. Arnold, V.V. Kozlov, A.I. Neishtadt. — Translated from the Russian by A. Jacob. — Encyclopedia of mathematical sciences, vol. 3. — Un vol. relié, 16,5 × 24, de XIV, 291 p. — Prix: DM 128.00. — Springer-Verlag, Berlin, 1988.

This work describes the fundamental principles, problems, and methods of classical mechanics. The authors have endeavored to give an exposition stressing the working apparatus of classical mechanics, rather than its physical foundations or applications. — *Contents:* Basic principles of classical mechanics. — The  $n$ -body problem. — Symmetry groups and reduction (lowering the order). — Integrable systems and integration methods. — Perturbation theory for integrable systems. — Nonintegrable systems. — Theory of small oscillations. — Comments on the bibliography and recommended reading.

Shreeram S. ABHYANKAR. — **Enumerative combinatorics of Young tableaux.** — Pure and applied mathematics, vol. 115. — Un vol. relié, 16 × 23,5, de 536 p. — Prix: \$119.50 (U.S.A. and Canada: \$99.75). — Marcel Dekker, Inc., New York, 1988.

Using a combinatorial approach, this book develops several enumerative formulas for counting certain sets of standard Young tableaux as well as certain sets of monomials. It systematically studies manipulations with summations and identities involving binomial coefficients by applying elementary yet powerful techniques.

**Algebraic geometry, Sendai, 1985.** — Edited by T.Oda. — Advanced studies in pure mathematics, vol. 10. — Un vol. relié, 16 × 24, de XII, 794 p. — Prix: Dfl. 450.00. — North-Holland, Amsterdam, (published jointly with, and distributed in Japan by Kinokuniya Co. Ltd., Tokyo), 1987.

This guide to algebraic geometry covers the active areas of the subject: birational geometry of higher dimensional algebraic varieties, Kähler manifolds and analytic varieties, abelian varieties, arithmetic algebraic geometry, rigid analytic spaces, cycles and vector bundles on algebraic varieties, mixed Hodge structures, period maps for  $K3$  surfaces and for isolated singularities. Many of the papers not only contain original results, but also survey the particular topics covered.

**Recent topics in nonlinear PDE III.** — Edited by Kyûya Masuda, Takashi Suzuki. — North-Holland mathematics studies, vol. 148. — Lecture notes in numerical and applied analysis,

vol. 9. — Un vol. broché,  $16,5 \times 4$ , de VIII, 266 p. — Prix: Dfl. 210.00. North-Holland, Amsterdam, (published jointly, and distributed in Japan by Kinokuniya Co. Ltd.), 1987.

The problems treated in this volume concern nonlinear partial differential equations occurring in the areas of fluid dynamics, free boundary problems, population dynamics and mathematical physics. Presented are new results and new methods for analysis in bifurcation, singular perturbation, variational methods, stability analysis, rearrangement, energy inequalities, etc...

**Topics in differential geometry.** — Edited by J. Szenthe and L. Tamássy. — *Colloquia mathematica societatis János Bolyai*, vol. 46. — Deux vol. reliés,  $18 \times 24$ , 1377 p. — Prix: Dfl. 600.00. — North-Holland, Amsterdam, 1988.

These two volumes are the proceedings of a Colloquium on Differential Geometry, organized in Hajduszoboszló, from 26 August to September 1 of 1984 by Debrecen University. They report on various topics in differential geometry, including Finsler geometry, Riemannian geometry, applications in general relativity, Hamiltonian systems and other topics in mathematical physics.

**Numerical methods.** — Edited by D. Greenspan and P. Rózsa. — *Colloquia mathematica societatis János Bolyai*, vol. 50. — Un vol. relié,  $18 \times 24$ , de 688 p. — Prix: Dfl. 425.00. — North-Holland, Amsterdam, 1988.

Reports of recent research are collected in this volume. The largest part of the book is a section on ordinary and partial differential equations, which presents new methods, and research on error behavior and convergence of known methods. Other sections examine linear algebra, applications, and nonlinear equations and optimization. Another chapter collects paper on interpolation, approximation, and moment problems, and also included is a survey of the linear algebra and differential equation parts of a commercial program package.

W. SIERPINSKI. — **Elementary theory of numbers.** — North-Holland mathematical library, vol. 31. — Second English edition. — Edited by A. Schinzel. — Un vol. relié,  $16 \times 23$ , de 516 p. — North-Holland, Amsterdam, (published jointly with, and distributed in the Socialist Countries by PWN-Polish Scientific Publishers, Warsaw), 1987.

Since the publication of the first edition, considerable progress have been made. This edition has been updated and enlarged, and the bibliography revised. The variety of topics covered here includes divisibility, diophantine equations, prime numbers (especially Mersenne and Fermat primes), the basic arithmetic functions, congruences, the quadratic reciprocity law, expansion of real numbers into decimal fractions, decomposition of integers into sums of powers, some other problems of the additive theory of numbers and the theory of Gaussian integers.

**A fête of topology: papers dedicated to Itiro Tamura.** — Edited by Y. Matsumoto, T. Mizutani, S. Morita. — Un vol. relié,  $16 \times 23,5$ , de XII, 602 p. — Prix: \$ 60.00. — Academic Press, Boston, 1988.

Dedicated to Prof. Itiro Tamura on the occasion of his sixtieth birthday, this volume contains a collection of outstanding papers that mirror the current progress in the field as well as Prof. Tamura's wide-ranging interests. The contents cover the theory of foliations, characteristic classes, singularities and orbifolds, 3- and 4-dimensional manifolds, and group actions.



John L. KELLEY, T.P. SRINIVASAN. — **Measure and integral, vol. 1.** — Graduate texts in mathematics, vol. 116. — Un vol. relié, 16,5 × 24, de x, 150 p. — Prix: DM 79.00. — Springer-Verlag, New York, 1988.

This book is a systematic exposition of the theory of measure and integration. It is intended for students, and also as a reference work. The body of the text can be read by a student with a firm background in analysis, whereas the supplements treat more advanced topics, and require somewhat more maturity. Although the results given here are the standard ones, the authors have taken a new approach, systematically exploiting the concepts of  $\sigma$ -ring and  $\sigma$ -simplicity.

John T. BALDWIN. — **Fundamentals of stability theory.** — Perspectives in mathematical logic. — Un vol. relié, 17,5 × 25, de XIII, 447 p. — Prix: DM 128.00. — Springer-Verlag, Berlin, 1988.

This volume is written as an introduction to first order stability theory. It is organized around the spectrum problem: calculate the number of models a first order theory  $T$  has in each uncountable cardinal. To solve this problem a generalization of the notion of algebraic independence "nonforking" was developed. The important notions of orthogonality and regularity are carefully developed. This machinery is then applied to the spectrum problem. Complete proofs of the Vaught conjecture for omega-stable theories are presented here for the first time in book form.

Eberhard FREITAG, Reinhardt KIEHL. — **Etale cohomology and the Weil conjecture.** — Ergebnisse der Mathematik und ihrer Grenzgebiete, 3. Folge, Bd. 13. — Un vol. relié, 17,5 × 25, de XVIII, 317 p. — Prix: DM 178.00. — Springer-Verlag, Berlin, 1988.

This book is concerned with one of the most important developments in algebraic geometry during the last decades. In 1949 André Weil formulated his famous conjectures about the numbers of solutions of diophantine equations in finite fields. In 1960 A. Grothendieck evolved a new foundation of algebraic geometry with the declared aim to come to a proof of the Weil conjectures by means of a new algebraic cohomology theory. The aim of this book is to develop as self-contained as possible and as short as possible Grothendieck 1-adic cohomology theory including Deligne's monodromy theory and to present his original proof of the Weil conjectures.

Jack R. PORTER, R. Grant WOODS. — **Extensions and absolutes of Hausdorff spaces.** — Un vol. relié, 16,5 × 24, de XIII, 856 p. — Prix: DM 178.00 — Springer-Verlag, New York, 1988.

The purpose of this book is to give a systematic treatment of the extensions and absolutes of Hausdorff spaces. By investigating the structure of lattices, powerful tools are obtained that allow the building of extensions and absolutes in a variety of ways. The first chapters of this book are preparatory, discussing elementary topology and associated concepts. It then proceeds to a detailed study of the main subject. Each chapter is followed by a lengthy collection of exercises ranging from routine verification to complex problems.

Ray MINES, Fred RICHMAN, Wim RUITENBURG. — **A course in constructive algebra.** — Universitext. — Un vol. broché, 15,5 × 23,5, de XI, 344 p. — Prix: DM 68.00. — Springer-Verlag, New York, 1988.

The constructive approach to mathematics has recently enjoyed a renaissance. This was caused by the proliferation of powerful computers, which stimulated the development of constructive algebra for implementation purposes. In this book, the authors present the fundamental structures of modern algebra from a constructive point of view. Beginning with basic notions, the authors proceed to treat principal ideal domains, field theory (including Galois theory), factorisation of polynomials, Noetherian rings, valuation theory, and Dedekind domains.

Izrail M. GELFAND. — **Collected papers, vol. 1.** — Edited by S.G. Gindikin, V.W. Guillemin, A.A. Kirillov, B. Kostant, S. Sternberg. — Un vol. relié, 17,5 × 24,5, de vi, 883 p. — Prix: DM 248.00. — Springer-Verlag, Berlin, 1987.

I.M. Gelfand, one of the leading contemporary mathematicians, largely determined the modern view of functional analysis with its numerous relations to other branches of mathematics, including mathematical physics, algebra, topology, differential geometry and analysis. With the publication of these Collected papers, in three volumes, Gelfand gives a representative choice of his papers written in the last fifty years. Some articles on numerical methods and cybernetics as well as a few on biology are included. A substantial part of the papers have been translated into English especially for this edition which is rounded off by an extensive bibliography with almost 500 references.

Carlo CERCIGNANI. — **The Boltzmann equations and its applications.** — Applied mathematical sciences, vol. 67. — Un vol. relié, 16 × 24, de xiii, 455 p. — Prix: DM 98.00. — Springer-Verlag, New York, 1988.

Basic principles of the kinetic theory of gases. — The Boltzmann equation. — Gas-surface interaction and the *H*-theorem. — Linear transport. — Small and large mean free paths. — Analytical solutions of models. — The transition regime. — Theorems on the solutions of the Boltzmann equation. — References.

N.N. KRASOVSKII, A.I. SUBBOTIN. — **Game-theoretical control problems.** — Translated by Samuel KOTZ. — Un vol. relié, 16 × 24, de xi, 517 p. — Prix: DM 248.00. — Springer-Verlag, New York, 1988.

This book is devoted to an investigation of control problems which can be described by ordinary differential equations and be expressed in terms of game theoretical notions. It contains definitions and formalizations of differential games, existence for equilibrium and extensive discussions of optimal strategies. Formal definitions are accompanied by suitable motivations and discussions of computational algorithms.

Gerhard PREUSS. — **Theory of topological structures: an approach to categorical topology.** — Mathematics and its applications, vol. 39. — Un vol. relié, 16,5 × 24,5, de xii, 304 p. — Prix: Dfl. 148.00/US\$69.00. — D. Reidel Publishing Company, Dordrecht, 1988.

In recent years it has become apparent that the intuitive concept of "nearness" which is fundamental in topology can be defined in a highly satisfactory way. By means of the resulting "nearness spaces" every topological concept or idea can be expressed. On the other hand, nearness spaces form a topological category. Thus categorical methods are developed in order to handle problems of a topological nature.

Vadim KOMKOV. — **Variational principles of continuum mechanics with engineering applications. Vol. 2: Introduction to optimal design theory.** — Mathematics and its applica-

tions, vol. 40. — Un vol. relié, 16,5 × 24,5, de VIII, 276 p. — Prix: Dfl. 140.00/US\$69.00. — D. Reidel Publishing Company, Dordrecht, 1988.

In volume 1 of this 2-volume work, the author dealt with the critical points theory approach. This second volume concentrates on the optimization of design theory and related problems. Group theoretic techniques, Noether invariance theory, and recent developments in broken symmetry and bifurcation theory are employed in the analysis.

Jean-Marie ARNAUDIES, Henri FRAYSSE. — **Cours de mathématiques 2: Analyse.** — Un vol. relié, 16 × 25, de VII, 680 p. — Prix: FF 290.00. — Bordas, Paris, 1988.

Ce volume développe les bases de l'analyse indispensables tant aux concours d'entrée aux grandes écoles que pour entreprendre des études scientifiques à dominante mathématique.

Geoffrey J. McLACHLAN, Kaye E. BASFORD. — **Mixture models: inference and applications to clustering.** — Statistics, textbooks and monographs; vol. 84. — Un vol. relié, 16 × 23,5, de XI, 253 p. — Prix: US\$169.75 (U.S. et Canada)/US\$83.50 (autres pays). — Marcel Dekker, New York, 1988.

Emphasizing the importance of mixture models in cluster analysis, the book shows how this approach to clustering provides a framework for assessing the number of clusters and their effectiveness. It also gives a detailed description of how bootstrap methodology can be used in these clustering problems.

Arijit CHAUDHURI, Rahul MUKERJEE. — **Randomized response: theory and techniques.** — Statistics: textbooks and monographs, vol. 85. — Un vol. relié, 15,5 × 23,5, de XVI, 162 p. — Prix: US\$69.75 (U.S. et Canada)/US\$83.50 (autres pays). — Marcel Dekker, New York, 1988.

When randomized response methods were first introduced, they have been recognized as a suitable means of analyzing queries about sensitive and confidential issues. But, as statistical and poll-taking techniques have grown in sophistication during these two decades, what are the most appropriate and efficient procedures for handling these data? This work attempts to provide the answer to this question.

**Biopharmaceutical statistics for drug development.** — Ed. by Karl E. Pearce. — Statistics: textbooks and monographs, vol. 87. — Un vol. relié, 18,5 × 26, de XII, 640 p. — Prix: US\$125.00 (U.S. et Canada)/US\$150.00 (autres pays). — Marcel Dekker, New York, 1988.

Spanning the breadth of pharmaceutical human drug research and development from a historical perspective to manufacturing and quality control practices, this work offers a complete treatment on the analytical aspects of its topic. It addresses applications of human drug development, with emphasis on methodologies and examples in biological or basic research, chemical research and development, preclinical research and development, clinical development.

Robert E. ODEH, D.B. OWEN. — **Parts per million values for estimating quality levels.** — Statistics: textbooks and monographs, vol. 87. — Un vol. relié, 18,5 × 26, de XI, 347 p. — Prix: US\$99.75 (U.S. et Canada)/US\$119.50 (autres pays). — Marcel Dekker, New York, 1988.

This work contains computed tables of factors for tolerance limits for very small proportions in the tails of a normal distribution and helps scientists and engineers meet quality require-

ments by covering the range of nonconformance levels needed for severely high quality in process control work.

P.P. PETRUSHEV, V.A. POPOV. — **Rational approximation of real functions.** — Encyclopedia of Mathematics and its Applications, vol. 28. — Un vol. relié,  $16 \times 23,5$ , de x, 371 p. — Prix: £40.00/US\$69.50. — Cambridge University Press, Cambridge, 1987.

This book is a comprehensive account of the theory and applications of regular variation. It is concerned with the asymptotic behavior of a real function of a real variable  $x$  which is "close" to a power of  $x$ . Such functions are much more than a convenient extension of powers. In many limit theorems regular variation is intrinsic to the result, and exactly characterises the limit behaviour. The book emphasises such characterisations and gives a comprehensive treatment of those applications where regular variation plays an essential role.

Mayer HUMI, William MILLER. — **Second course in ordinary differential equations for scientists and engineers.** — Universitext. — Un vol. broché,  $15,5 \times 23,5$ , de xi, 441 p. — Prix: DM 98.00. — Springer-Verlag, Berlin, 1988.

This book fills the need for a junior-level book on the more advanced topics of differential equations. It attempts to blend mathematical theory with nontrivial applications from various disciplines. It does not contain lengthy proofs of mathematical theorems. A wide range of topics is included to afford flexibility if used for a course.

Thomas A. WHITELAW. — **Introduction to abstract algebra.** — 2nd edition. — Un vol. broché,  $15 \times 23$ , de vii, 200 p. — Prix: 10.95. — Blackie and Son, Glasgow, 1988.

This new edition has been revised to take account of new trends and developments in mathematics teaching. To ensure a thorough understanding of necessary basic knowledge, the first 4 chapters revise the foundations of equivalence relations, mappings and the notations and vocabulary of set theory. Later chapters provide a comprehensive treatment of groups and semigroups.

Kenneth H. ROSEN. — **Elementary number theory and its applications.** — Second edition. — Un vol. relié,  $17 \times 24$ , de xiii, 466 p. — Prix: \$37.95. — Addison-Wesley Publishing Company, Reading, Mass., 1988.

This text was the first number theory text to integrate developments in cryptology and computer science with traditional topics. All the strengths of the first edition have been preserved in this second edition along with many new features that enhance its flexibility including new sections on basic axioms for integers and mathematical induction, additional routine and challenging exercises, simplified proofs of theorems, earlier introduction of Fibonacci numbers, and expanded coverage of big-O notation.

**Geometries and groups.** — Proceedings of the Workshop Geometries and Groups, Finite and Algebraic, Noordwijkerhout, Holland, March 1986. — Edited by M. Aschbacher, A.M. Cohen and W.M. Kantor. — Reprinted from *Geometriae dedicata*, vol. 25, Nos 1-3 (1988). — Un vol. relié,  $16,5 \times 25$ , de 542 p. — Prix: Dfl. 240.00. — D. Reidel Publishing Company, Dordrecht, 1988.

The workshop was set up in order to stimulate the interaction between (finite and algebraic) geometries and groups. Five areas of concentrated research were chosen on which attention would be focused, namely: diagram geometries and chamber systems with transitive automor-

phism groups, geometries viewed as incidence systems, properties of finite groups of Lie type, geometries related to finite simple groups, and algebraic groups. The contributions to these proceedings mainly belong to the first three areas.

**Stochastic processes in physics and engineering.** — Edited by Sergio Albeverio, Philip Blanchard, Michiel Hazewinkel and Ludwig Streit. — Mathematics and its applications. — Un vol. relié, 17 × 25, de XI, 415 p. — Prix: Dfl. 180.00. — D. Reidel Publishing Company, Dordrecht, 1988.

This book presents the fruits of a dialogue between physicists, engineers, and mathematicians drawn from the contributions made at the BiBos IV Symposium, held on 21-26 April 1986 in Bielefeld, F.R.G., a symposium specifically designed to ease the flow of communication between the various schools of "stochasticists".

Marlow ANDERSON, Todd FEIL. — **Lattice-ordered groups: an introduction.** — Reidel texts in the mathematical sciences. — Un vol. relié, 16,5 × 24,5, de VII, 190 p. — Prix: Dfl. 98.00. — D. Reidel Publishing Company, Dordrecht, 1988.

After an initial presentation of the introductory material, the four main representation theorems for  $l$ -groups are given. The following chapters explore free  $l$ -groups, varieties and torsion classes of  $l$ -groups, completions of representable and archimedean  $l$ -groups, the lateral completion, finite-valued and special-valued  $l$ -groups and groups of divisibility. A large collection of examples is included as well as an up-to-date bibliography of primary references in the field.

**Galois representations and arithmetic algebraic geometry.** — Edited by Y. Ihara. — Advanced studies in pure mathematics, vol. 12. — Un vol. relié, 16 × 24, de XII, 374 p. — Prix: Dfl. 320.00. — North-Holland, Amsterdam, (published jointly with, and distributed in Japan by Kinokuniya, Tokyo), 1987.

One main theme of this volume is the Galois representation arising from pro- $l$ -étale coverings of curves. Its group theoretic aspect is represented by papers on arithmetic analogues of braid groups, and the arithmetic aspect by those on the adelic beta functions and Jacobi sums. The other main theme is the higher dimensional ramification theory and class field theory.

**Commutative algebra and combinatorics.** — Edited by M. Nagata, H. Matsumura. — Advanced studies in pure mathematics, vol. 11. — Un vol. relié, 16 × 24, de XIV, 360 p. — Prix: Dfl. 310.00. — North-Holland, Amsterdam, (published jointly with, and distributed in Japan by Kinokuniya, Tokyo), 1987.

The emphasis of this volume is on the interplay of commutative algebra, combinatorics and group representations. Recent topics such as classification of maximal Cohen-Macaulay modules are also included. The articles are a mixture of surveys by leading authorities and original papers containing important new ideas. The papers include a successful application of the ideas of combinatorics to the theory of artinian rings, a classification of Buchsbaum modules over regular local rings, and a study of maximal Cohen-Macaulay modules over Gorenstein rings.

Philippe G. CIARLET. — **Mathematical elasticity. Vol. 1: Three-dimensional elasticity.** — Studies in mathematics and its applications, vol. 20. — Un vol. relié, 15,5 × 23, de XL, 451 p. — Prix: US\$ 107.25/Dfl. 220.00. — North-Holland, Amsterdam, 1988.



This book is a thorough introduction to contemporary research in elasticity, which has become the object of renewed interest over the past few decades. One reason is the acknowledgment that classical linear models of elasticity have a limited range of applicability, another is that validity of the classical lower-dimensional models is no longer left unquestioned.

Mike PREST. — **Model theory and modules.** — London Mathematical Society lecture note series, no. 130. — Un vol. broché, 1523, de XVII, 380 p. — Cambridge University Press, Cambridge, 1988.

The theme of this book is the interplay between model theory and the theory of modules. Basic ideas are developed concerning what can be said about modules using information which may be expressed in a first-order language. Later chapters discuss stability-theoretic aspects of modules, and structure and classification theorems over various types of rings and for certain classes of modules.

John L. PHILLIPS, Jr. — **How to think about statistics.** — Un vol. broché, 15,5 × 23,5, de XIV, 198 p. — Prix: £14.95 (relié)/£7.95 (broché). — W.H. Freeman, New York, 1988.

This book is an introduction to the logic behind statistical analysis and problem solving. Instead of focusing on numerical computations, it emphasizes the thinking behind the numbers and shows how statistics are applied in such fields as psychology, education, politics, sociology and social work.

Mark GORESKEY, Robert MacPHERSON. — **Stratified Morse theory.** — Ergebnisse der Mathematik und ihrer Grenzgebiete, 3. Folge, Band 14. — Un vol. relié, 17 × 25, de xv, 272 p. — Prix: DM 148.00. — Springer-Verlag, Berlin, 1988.

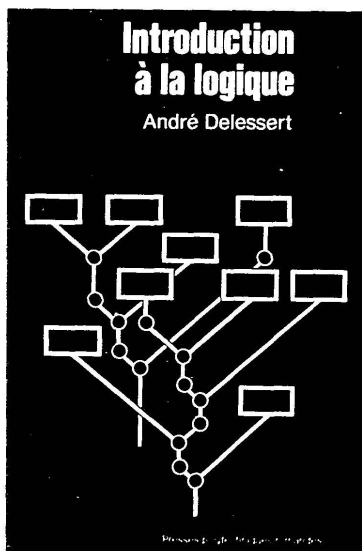
This book contains a complete and elementary survey - including an extended bibliography - on stratification theory, including its historical development. Some further topics in the book are: Morse theory, singularities, transversality theory, complex analytic varieties, Lefschetz theorems, connectivity theorems, intersection homology, complements of affine subspaces and combinatorics.

Yu.D. BURAGO, V.A. ZALGALLER. — **Geometric inequalities.** — Translated from the Russian by A.B. Sossinsky. — Grundlehren der mathematischen Wissenschaften, Band 285. — Un vol. relié, 16 × 23,5, de XIV, 331 p. — Prix: DM 184.00. — Springer-Verlag, Berlin, 1988.

This is a survey of geometric inequalities encompassing both classical aspects and new achievements. In particular, it contains definitive results on isoperimetry on surfaces (including non-smooth surfaces) and on isoperimetry in  $R^n$  and in spaces with constant curvature. Specific inequalities for convex bodies are given, including elements of the theory of mixed volumes and the algebraic proof of the Alexandrov-Fenchel's inequality.

Calvin C. MOORE, Claude SCHOCHET. — **Global analysis on foliated spaces.** — Mathematical Sciences Research Institute publications, vol. 9. — Un vol. relié, 16 × 24, de VII, 337 p. — Prix: DM 72.00. — Springer-Verlag, New York, 1988.

A variety of aspects of analysis and geometry on foliated spaces are developed in this book. These strands are then brought together to provide a context and to expose Connes' index theorem for foliated spaces, a theorem which asserts the equality of the analytic and the topological index (two real numbers) which are associated to a tangentially elliptic operator. An additional purpose of this exposition is preparing the way towards the more general index theorem of Connes and Skandalis.



# Introduction à la logique

*André Delessert*

Destiné à un large public, ce livre, qui ne nécessite pas de connaissances avancées en mathématiques, est axé principalement sur la logique du premier ordre. L'intention générale est de proposer des faits de logique non banals, tels que le

théorème de complétude de la logique de premier ordre et ses divers corollaires. Quelques relations avec la langue, la philosophie et les fondements des mathématiques sont abordées à la lumière des résultats démontrés. Sans réel équivalent en langue française, cet ouvrage s'adresse aux étudiants de toutes disciplines, mais particulièrement en mathématiques, en physique, en droit, en lettres et en philosophie ainsi qu'aux enseignants des écoles secondaires et des universités.

Les langages du premier ordre - L'idée de modèle ensembliste - La logique (ou calcul) des propositions. Les fonctions de vérité - Les axiomes de l'égalité ou formules de Leibniz - La logique des quantificateurs. La méthode de Henkin: la réduction à la logique des propositions - L'idée de preuve. Le théorème de complétude de la logique du premier ordre - Extension de la logique élémentaire de premier ordre - Quelques remarques sur la logique du premier ordre - Aperçus sur d'autres logiques.

1988, 204 pages, 16x24 cm, 17 figures et tableaux, broché, SFr. 68.50

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