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## BULLETIN BIBLIOGRAPHIQUE

**Analysis and design of algorithms for combinatorial problems.** — Edited by G. Ausiello and M. Lucertini. — North-Holland mathematics studies, vol. 109. — Annals of discrete mathematics, vol. 25. — Un vol. broché,  $16,5 \times 24$ , de x, 319 p. — Prix: Dfl. 130.00. — North-Holland, Amsterdam/New York/Oxford, 1985.

This volume contains a selected collection of papers based on the issues presented by the authors at the workshop "Analysis and design of algorithms for combinatorial problems", held at CISM in Udine in September 1982. The subjects of the papers range from optimization over graphs and hypergraphs to basic combinatorics, from data structures to machine models and from probabilistic analysis of algorithms to applications in computer architecture design.

Masaki KASHIWARA. — **Introduction to microlocal analysis.** — Monographie de l'Enseignement Mathématique N° 31, Série des conférences de l'Union Mathématique Internationale N° 7. — Un vol. broché,  $16 \times 24$ , de 38 p. — Prix: FS 25.00. — L'Enseignement Mathématique, Université de Genève, 1986.

These survey lectures were given at the University of Bern in June 1984, under the sponsorship of the International Mathematical Union. They explain the microlocal point of view (consideration of the cotangent bundle) for the study of linear differential equations. *Contents:* Introduction. — Systems of differential equations. — Micro-differential operators. — The algebraic properties of the ring of micro-differential operators. — The vanishing cycle sheaf. — Micro-differential operators and the symplectic structure on the cotangent bundle. — Quantized contact transformations. — Functorial properties of micro-differential modules. — Regularity conditions. — Structure of regular holonomic modules. — Application to the  $b$ -function.

**Séminaire de probabilité XIX, 1983-1984: proceedings.** — Edité par J. Azéma et M. Yor. — Lecture notes in mathematics, vol. 1123. — Un vol. broché,  $16,5 \times 24$ , de iv, 504 p. (88 p. en anglais). — Prix: DM 72.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

34 exposés par: E. Nelson. — P. A. Meyer et W. A. Zheng. — R. Durrett. — U. G. Haussmann. — P. Sälminen. — D. I. Hadjiev. — L. Schwartz. — D. Bakry. — D. Bakry et M. Emery. — N. Kôno. — C. Stricker. — C. Dellacherie. — J. Ruiz de Chavez. — E. Perkins. — R. Léandre. — N. Kazamaki. — D. Duffie. — N. Dinculeanu. — Ph. Biane. — J. F. Le Gall. — M. Yor. — M. Liao. — J. Azema. — K. L. Chung.

**Algebraic geometry, Sitges (Barcelona), 1983.** — Proceedings of a conference held in Sitges (Barcelona), Spain, October 5-12, 1983. — Edited by E. Casas-Alvero, G. E. Welters and S. Xambo-Descamps. — Lecture notes in mathematics, vol. 1124. — Un vol. broché,  $16,5 \times 24$ , de xi, 416 p. — Prix: DM 57.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The basic goal of this meeting on algebraic geometry was to contribute to the development of research. It offers to graduate students and young researchers several courses of lectures and a number of talks intended to introduce them to interesting, new results and open problems in areas such as low-dimensional varieties vector bundles, cycles or enumerative geometry.

**Dynamical systems and bifurcations.** — Proceedings of a workshop held in Groningen, the Netherlands, April 16-20, 1984. — Edited by B. L. J. Braaksma, H. W. Broer and F. Takens. — Lecture notes in mathematics, vol. 1125. — Un vol. broché, 16,5 × 24, de v, 129 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The proceedings on “Dynamical systems and bifurcations” paid particular attention to the field of geometric theory. The papers included in this volume report on recent research. The main topics are: Hamiltonian systems — Conley-Zehnder theorem and Arnold conjecture; stationary solutions and their bifurcations; structural stability and moduli.

**Algebraic and geometric topology.** — Proceedings of a conference held at Rutgers University, New Brunswick, USA, July 6-13, 1983. — Edited by A. Ranicki, N. Levitt and F. Quinn. — Lecture notes in mathematics, vol. 1126. — Un vol. broché, 16,5 × 24, de v, 423 p. — Prix: DM 57.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The conference was concerned with recent advances in the theory of surgery on manifolds, with the aim of disseminating new research results on this topic. The proceedings consists entirely of research papers, not just on surgery theory but also on the algebraic  $K$ -theory of spaces, finiteness obstruction, torsion, and group actions on manifolds.

**Numerical methods in fluid dynamics.** — Lectures given at the 3rd 1983 session of the Centro internazionale matematico estivo (CIME) held at Como, Italy, July 7-15, 1983. — Edited by F. Brezzi. — Lecture notes in mathematics, vol. 1127. — Un vol. broché, 16,5 × 24, de VII, 333 p. — Prix: DM 45.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

*R. Glowinski, J. Periaux:* Finite element, least squares and domain decomposition methods for the numerical solution of nonlinear problems in fluid dynamics. — *G. Gottlieb, Eli Turkel:* Topics in spectral theory. — *A. Jameson:* Transonic flow calculations for aircraft. — *P. A. Raviart:* An analysis of particle methods.

**Numerical analysis, Lancaster 1984.** — Proceedings of the SERC summer school, held in Lancaster, England, Jul. 15-Aug. 3, 1984. — Edited by P. R. Turner. — Lecture notes in mathematics, vol. 1129. — Un vol. broché, 16,5 × 24, de XIV, 179 p. — Prix: DM 26.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

*E. W. Cheney:* Five lectures on the algorithmic aspects of approximation. — *C. A. Micchelli, T. J. Rivlin:* Lectures on optimal recovery. — *A. Schatz:* An introduction to the analysis of the error in the finite element method for second-order elliptic boundary value problems. — *R. E. Showalter:* Variational theory and approximation of boundary value problems.

**Methods in mathematical logic.** — Proceedings of the 6th Latin American symposium on mathematical logic held in Caracas, Venezuela, August 1-6, 1983. — Edited by C. A. Di Prisco. — Lecture notes in mathematics, vol. 1130. — Un vol. broché, 16,5 × 24, de VII, 407 p. — Prix: DM 57.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This proceedings volume includes two survey papers (Dickmann, Makkai) as well as research papers covering different aspects of set theory, model theory, arithmetic and nonclassical logics, with emphasis on applications of logic to other areas of mathematics.

Kondagunta SUNDARESAN, Srinivasa SWAMINATHAN. — **Geometry and nonlinear analysis in Banach spaces.** — Lecture notes in mathematics, vol. 1131. — Un vol. broché,  $16,5 \times 24$ , de III, 116 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

A coherent presentation is given here of the interplay between the geometric theory and infinite dimensional differential analysis. After recapitulating the necessary background results, various higher order differentiability properties of the norm are then discussed. Next, the question is asked as to whether an open cover of a Banach space admits locally finite partitions of unity subordinated to it, such that a given smoothness condition is satisfied. This is followed by an exposition of some approximation theorems in infinite dimensional spaces. An appendix deals with a few results on the geometry of infinite dimensional differential manifolds modelled on Banach spaces.

Krzysztof C. KIWIEL. — **Methods of descent for nondifferentiable optimization.** — Lecture notes in mathematics, vol. 1133. — Un vol. broché,  $16,5 \times 24$ , de VI, 362 p. — Prix: DM 51.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This research monograph discusses numerical methods for minimizing functions of several real variables that are not necessarily smooth or convex but are locally Lipschitz continuous. It gives a complete state-of-the-art in descent methods for nondifferentiable optimization. A unifying theme of the book is the use of subgradient selection and aggregation strategies in the construction of algorithms that are both convergent and readily implementable. Several modifications and extensions of the existing algorithms are presented and analysed in detail, so that computer programs may readily be written.

Audrey TERRAS. — **Harmonic analysis on symmetric spaces and applications I.** — Un vol. broché,  $15,5 \times 23,5$ , de XII, 341 p. — Prix: DM 138.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

By concentrating on the simplest symmetric spaces — Euclidean space, the sphere, and the upper half plane — the author has managed to produce a book which can be read by a wide audience. The book is intended as a text for beginning graduate students, and has been used in courses in harmonic analysis, Lie groups, mathematical physics, and number theory. It differs from most other books on the subject by staying at an introductory level, and by emphasizing motivation, applications, concrete examples, and the history of the subject.

Serge LANG. — **Complex analysis.** — 2nd edition. — Graduate texts in mathematics, vol. 103. — Un vol. relié,  $16 \times 24$ , de XIV, 367 p. — Prix: DM 128.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

This new, revised edition, consists of two parts: the first covers the basic material of complex analysis, and the second covers many special topics: such as elliptic functions, the gamma function, and analytic continuation. Lang emphasizes the use of formal power series. In this 2nd edition, the author has rewritten many sections of the book and has added some material.

Jerrold MARSDEN, Alan WEINSTEIN. — **Calculus II.** — 2nd edition. — Un vol. broché,  $19 \times 26,5$ , de xv, 345 p. — Prix: DM 69.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

This book, the second of a three-volume work, is the outgrowth of the authors' experience teaching calculus at Berkeley. It covers techniques and applications of integration, infinite series, and differential equations. Throughout the book, the authors motivate the study of calculus using its applications.

Jerrold MARSDEN, Alan WEINSTEIN. — **Calculus III.** — 2nd edition. — Un vol. broché,  $19 \times 26,5$ , de xv, 341 p. — Prix: DM 69.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

This book, the 3rd of the three volume work, is concerned with multivariable calculus, and begins with the necessary material from analytic geometry. It goes on to cover partial differentiation, the gradient and its applications, multiple integration, and the theorems of Green, Gauss, and Stokes.

Paul R. HALMOS. — **I want to be a mathematician: an automathography.** — Un vol. relié,  $16 \times 24$ , de xvi, 421 p. — Prix: DM 134.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

This book is an account of the author's professional life as a mathematician. P. R. Halmos is well known for his research in functional analysis, ergodic theory, polyadic algebras, etc. as well as being one of the widest expositors of higher mathematics today. His career reflects the development of American mathematics to its current leading role in the world.

B. L. van der WAERDEN. — **A history of algebra: from al-Khwarizmi to Emmy Noether.** — Un vol. relié,  $17 \times 25$ , de xi, 271 p. — Prix: DM 98.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The historical development of algebraic equations, groups and algebras is the central theme of this new important contribution to the history of mathematics. Chapters of special interest are those on algebra in Italy, on Gauss, on Galois, on Hamilton, and on the author's own teacher, Emmy Noether.

Richard S. ELLIS. — **Entropy, large deviations, and statistical mechanics.** — Grundlehren der mathematischen Wissenschaften, vol. 271. — Un vol. relié,  $16 \times 24$ , de xiv, 364 p. — Prix: DM 184.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

The author stresses the interconnection between large deviations and equilibrium statistical mechanics via the concept of entropy. This is the first book published which treats the theory of large deviations. Much of the mathematics treated in this book has its origin in physics, particularly statistical mechanics.

E. Graham EVANS & Phillip GRIFFITH. — **Syzygies.** — London mathematical society lecture note series, vol. 106. — Un vol. broché,  $15 \times 23$ , de 124 p. — Prix: £9.95. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1985.

In this book are described the basic properties of syzygies. The emphasis is on syzygies of finite projective dimension over local rings, which find successful applications to questions in

commutative algebra and algebraic geometry. At the end is a set of exercises ranging from the essentially straightforward to interesting applications of the theory.

**Multivariate analysis VI.** — Proceedings of the sixth international symposium on multivariate analysis. — Ed. by Paruchuri R. Krishnaiah. — Un vol. relié, 15,6 × 23, de 648 p. — Prix: Dfl. 300.00. — North-Holland, Amsterdam/New York/Oxford, 1985.

The invited papers in this volume cover a very broad spectrum of topics on theory and applications of multivariate analysis. The range includes anthropology, asymptotic expansions, discriminant analysis, econometrics, estimation, human genetics, large dimensional random matrices, multivariate analysis of variance, optimum properties of tests, quality control and reliability, selection of variables, structural models and time series and stochastic processes.

**Multivariate approximation theory III.** — Proceedings of the conference at the Mathematical research institute at Oberwolfach, Black Forest, January 20-26, 1985. — Ed. by Walter Schempp and Karl Zeller. — International series of numerical mathematics, vol. 75. — Un vol. relié, 17 × 24, de 400 p. — Prix: Sfr. 84.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1985.

35 lectures covering different problems on multivariate approximation such as polynomial approximation on simplices, multivariate splines (box-splines, dimension of spline spaces), blending methods, multivariate Hermite interpolation, data smoothing and surface representation, and multivariate summation methods.

**Séminaire de théorie des nombres, Paris 1983-84.** — Séminaire Delange-Pisot-Poitou. — Ed. by Catherine Goldstein. — Progress in mathematics, vol. 59. — Un vol. relié, 15,5 × 23, de VIII, 278 p. — Prix: Sfr. 72.00. — Birkhäuser, Boston/Basel/Stuttgart, 1985.

17 exposés par: D. Bernardi. — D. W. Boyd. — J. Denef. — J.-M. Deshouillers et G. Tenenbaum. — J. H. Evertse. — E. Fouvry. — C. Goldstein. — G. Henniart. — H. Hida. — J. Martinet. — J. Oesterlé. — A. P. Ogg. — P. Philippon. — G. Robert. — C. G. Schmidt. — C. Soulé. — J.-P. Wintenberger.

Corneliu CONSTANTINESCU and Karl WEBER, in collaboration with Alexia SONTAG. — **Integration theory, volume 1: measure and integral.** — Pure and applied mathematics. — Un vol. relié, 17 × 24, de XIII, 520 p. — Prix: £50.65. — John Wiley and sons, New York/Chichester/Brisbane/Toronto/Singapore, 1985.

Riesz lattices and Daniell spaces. — Measure spaces, associated Daniell spaces, and Stieltjes functionals. — The closure of a Daniell space. — The integral for a Daniell space. — Integrals derived from measures and measurability. — *Appendix*: Historical remarks on the definition of the integral. — Important exercise topics.

Neil CAMERON. — **Introduction to linear and convex programming.** — Australian mathematical society lecture series, vol. 1. — Un vol. broché, 15 × 23, de 149 p. — Prix: £6.95 (relié: £20.00). — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1985.

This introduction to optimisation emphasises the need for both a pure and an applied point of view. Beginning with a chapter on linear algebra and Euclidean geometry, the author then

applies this theory with an introduction to linear programming. There follows a discussion of convex analysis, which finds application in nonlinear programming. The book ends with an extensive commentary to the exercises that are given at the end of each chapter.

Jean-Pierre KAHANE. — **Some random series of functions.** — 2nd edition. — Cambridge studies in advanced mathematics, vol. 5. — Un vol. relié, 16 × 23,5, de XIII, 305 p. — Prix: £30.00. — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1985.

This is a substantially revised and updated edition of Professor Kahane's book "Some random series of functions", first published in 1968. It covers random series in Banach or Hilbert spaces, random Taylor or Fourier series, Brownian motion and other Gaussian processes, and certain types of random sets and measures.

R. P. BURN. — **Groups: a path to geometry.** — Un vol. relié, 16 × 23,5, de XII, 242 p. — Prix: £27.50. — Cambridge University press, Cambridge/London/New York/Rochelle/Melbourne/Sydney, 1985.

This book consists of a carefully constructed sequence of questions which will enable the reader, to generate all the group theory covered by a conventional first university course. An introduction to vector spaces, leading to the study of linear groups, and an introduction to complex numbers, leading to the study of Möbius transformations and stereographic projection, are also included.

**Steklov seminar, 1984: Statistics and control of stochastic processes.** — Ed. by N. V. Krylov, R. Sh. Lipster, and A. A. Novikov. — Translation series in mathematics and engineering. — Un vol. relié, 17,5 × 24, de XIII, 506 p. — Prix: DM 198.00. — Optimization software, Inc. publications division, New York, 1985.

The main topics featured at the seminar are: statistical and sequential analysis, filtering, stochastic control of random processes, and related stochastic calculus (martingales, stochastic differential systems). This volume is dedicated to Professor Albert Nikolaevich Shiryaev on his 50th birthday. All the participants of the seminar have been enriched by his ideas and have freely partaken of his vast store of knowledge.

Wolf VON WAHL. — **The equations of Navier-Stokes and abstract parabolic equations.** — Aspects of mathematics, vol. E8. — Un vol. broché, 16,5 × 23, de XXIV, 264 p. — Prix: DM 54.00. — Friedr. Vieweg und Sohn, Braunschweig/Wiesbaden, 1985.

Linear equations of parabolic type. — Local solutions of first order semilinear evolution equations. — Local solvability of the equations of Navier-Stokes. — Global existence and global regularity for the Navier-Stokes equations. — Global solutions of abstract nonlinear parabolic equations and applications. "Comments" at the end of each chapter.

Roger D. NUSSBAUM. — **The fixed point index and some applications.** — Séminaire de mathématiques supérieures, séminaire scientifique OTAN (NATO advanced study institute), vol. 94. — Un vol. broché, 21,5 × 28, de 145 p. — Prix: \$18.00. — Les presses de l'Université de Montréal, Montréal, 1985.

The topological degree and the fixed point index of mappings. — The Krein-Rutman theorem. — The mod  $p$  theorem for the fixed point index. — Global bifurcation theorems in metric ANR'S. — Periodic solutions of a nonlinear differential-delay equation.

**Méthodes topologiques en analyse non linéaire.** — Comptes rendus colligés par Andrzej Granas. — Séminaire de mathématiques supérieures, séminaire scientifique OTAN (NATO advanced study institute), vol. 95. — Un vol. broché,  $21,5 \times 28$ , de 235 p. — Prix: \$22.00. — Les presses de l'Université de Montréal, Montréal, 1985.

8 exposés par: J. Appell. — M. S. Berger. — E. Fadell. — P. M. Fitzpatrick, I. Massabo, J. Pejsachowicz. — G. Fournier, L. Gorniewicz. — E. W. C. van Groesen. — Fon-che Liu. — H. Steinlein.

T. S. BLYTH and E. F. ROBERTSON. — **Algebra through practice, Book 4: Linear algebra, Book 5: Groups, Book 6: Rings, fields and modules.** — 3 vol. brochés,  $14,5 \times 21$ , de, respectivement, VIII, 104 p., IX, 101 p. et IX, 100 p. — Prix: £3.50 chaque vol. — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1985.

With this series of books the authors have provided a selection of problems with complete solutions and test papers designed to be used with or instead of standard textbooks on algebra. For the convenience of the reader, a key explaining how the present books may be used in conjunction with some of the major textbooks is included. Each book of problems is divided into chapters that begin with some notes on notation and prerequisites.

**Operator algebras and their connections with topology and ergodic theory.** — Proceedings of the OATE conference held in Busteni, Romania, Aug. 29-Sept. 9, 1983. — Ed. by H. Araki, C. C. Moore, S. Stratila and D. Voiculescu (with the assistance of Gr. Arsene). — Lecture notes in mathematics, vol. 1132. — Un vol. broché,  $16,5 \times 24,5$ , de VI, 594 p. — Prix: DM 78.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This volume contains mainly invited papers from the Busteni conference on operator algebras with special emphasis on topological methods (especially  $K$ -theory) and on the interplay with ergodic theory. As a whole, it gives a faithful and fairly complete picture of the present stage of development in operator algebras. The papers included are either research articles with full proofs or comprehensive surveys of several research directions in the field.

Giovanni P. GALDI and Salvatore RIONERO. — **Weighted energy methods in fluid dynamics and elasticity.** — Lecture notes in mathematics, vol. 1134. — Un vol. broché,  $16,5 \times 24,5$ , de VII, 126 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This research monograph deals with various mathematical aspects in the dynamics of viscous fluids and elastic bodies. It aims in particular to solve nonlinear stability problems in hydrodynamics and magneto-hydrodynamics, and uniqueness and continuous dependence in elasticity. All these results are obtained by the use of weighted energy methods, i.e. spatially weighted norms.

**Number theory.** — A seminar held at the graduate School and University center of the City University of New York, 1983-84. — Ed. by D. V. Chudnovsky, G. V. Chudnovsky, H. Cohn and

M. B. Nathanson. — *Lecture notes in mathematics*, vol. 1135. — Un vol. broché, 16,5 × 24,5, de v, 283 p. — Prix: DM 38.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This volume comprises a selection of papers based on lectures presented at the New York number theory seminar 1983-84. They are original research reports on topics including diophantine geometry and diophantine approximations, automorphic functions and relations with algebraic geometry.

**Quantum probability and applications II.** — Proceedings of a workshop held in Heidelberg, West Germany, October 1-5, 1984. — Ed. by L. Accardi and W. von Waldenfels. — *Lecture notes in mathematics*, vol. 1136. — Un vol. broché, 16,5 × 24,5, de vi, 534 p. — Prix: DM 72.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The papers in this volume, mostly research reports, deal notably with the theory of quantum stochastic processes and of quantum stochastic differential equations. Some also consider the quantum theory of ergodicity and quantum chaos, as well as physical applications, e.g. light emission and quantum tunneling.

**Differential geometric methods in mathematical physics.** — Proceedings of an international conference held at the Technical university of Clausthal, FRG, August 30-September 2, 1983. — Edited by H. D. Doebner and J. D. Hennig. — *Lecture notes in mathematics*, vol. 1139. — Un vol. broché, 16,5 × 24,5, de vi, 337 p. — Prix: DM 51.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

As in previous meetings the focus was on the application of geometric, analytic and algebraic methods, especially differential-geometric and -topological ones to the modelling in complex physical systems. Apart from a few advanced survey articles the contributions are original research work.

Stephen DONKIN. — **Rational representations of algebraic groups: tensor products and filtrations.** — *Lecture notes in mathematics*, vol. 1140. — Un vol. broché, 16,5 × 24,5, de vii, 254 p. — Prix: DM 38.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This monograph is devoted to the study of certain induced modules for algebraic groups which are important in the representation theory of algebraic groups and also in the geometry of Schubert varieties. The main results concern the structure of tensor products of the induced modules and their restriction to parabolic subgroups.

**Encyclopedia of statistical sciences, volume 6: multivariate analysis to Plackett and Burman designs.** — Edited by Samuel Kotz, Norman L. Johnson, Campbell B. Read. — Un vol. relié, 18,5 × 26, de x, 758 p. — Prix: £74.00. — John Wiley & Sons, New York/Chichester/Brisbane/Toronto/Singapore, 1985.

All users of statistics will turn to the "Encyclopedia of statistical sciences" as an essential reference work on statistical methods and their application to virtually all facets of human endeavor. Both professionals and student statisticians will find here immediate applicable information.

Errett BISHOP, Douglas BRIDGES. — **Constructive analysis.** — Grundlehren der mathematischen Wissenschaften, vol. 279. — Un vol. relié, 16 × 24, de XII, 477 p. — Prix: DM 138.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This volume grew out of the first author's text, "Foundations of constructive analysis", and contains a systematic development of modern analysis within a constructive framework. In this development, particular attention is paid to the meaning, or interpretation, of mathematical results.

Murray ROSENBLATT. — **Stationary sequences and random fields.** — Un vol. relié, 17 × 24, de 258 p. — Prix: FS 92.00. — Birkhäuser, Boston/Basel/Stuttgart, 1985.

Stationary processes. — Prediction and moments. — Quadratic forms, limit theorems and mixing conditions. — Estimation of parameters of finite parameter models. — Spectral density estimates. — Cumulant spectral estimates. — Density and regression estimates. — Non-Gaussian linear processes. — Appendices.

Gerhard BURDE, Heiner ZIESCHANG. — **Knots.** — De Gruyter studies in mathematics, vol. 5. — Un vol. relié, 17 × 24, de XII, 399 p. — Prix: DM 138.00. — Walter de Gruyter, Berlin/New York, 1985.

This book presents the classical theory of knots in 3-space. The first part of the book is devoted to the basic topics. The remaining chapters contain some selected and more specialized subjects such as braids, quadratic forms of knots, the construction of 3-manifolds as branched coverings over links, presentations of knot groups, periodicity of knots, torus and Montesinos knots, results on property *P*.

M. H. A. DAVIS, R. B. VINTER. — **Stochastic modelling and control.** — Monographs on statistics and applied probability. — Un vol. relié, 14,5 × 22, de XII, 393 p. — Prix: £20.00. — Chapman and Hall, London/New York, 1985.

This book provides a unified treatment of mathematical modelling and control for linear systems in discrete time. It brings together recent developments in time series analysis and stochastic modelling on the one hand with the major results on linear filtering and stochastic control on the other.

**Trends in the theory and practice of non-linear analysis.** — Proceedings of the vith international conference on trends in the theory and practice of non-linear analysis held at the University of Texas at Arlington, June 18-22, 1984. — Edited by V. Lakshmikantham. — North-Holland mathematics studies, vol. 110. — Un vol. broché, 16,5 × 24, de x, 492 p. — Prix: Dfl. 190.00. — North-Holland, Amsterdam/New York/Oxford, 1985.

In summary, this book attempts to put together the work of a wide range of mathematicians, scientists, and engineers. The problems are both theoretical as well as computational, deterministic as well as stochastic, and the models include differential equations in such fields as biology, chemistry, and physics.

José GARCIA-CUERVA and José L. RUBIO DE FRANCIA. — **Weighted norm inequalities and related topics.** — North-Holland mathematics studies, vol. 116. — Notas de matematica, vol. 104.

— Un vol. broché,  $16,5 \times 24$ , de x, 604 p. — Prix: Dfl. 175.00. — North-Holland, Amsterdam/New York/Oxford, 1985.

Classical theory of Hardy spaces. — Calderon-Zygmund theory. — Real variable theory of Hardy spaces. — Weighted norm inequalities. — Vector valued inequalities. — Factorization theorems and weighted norm inequalities. — *Appendices*: Rademacher functions. The minimax lemma.

Robert CARROLL. — **Transmutation theory and applications.** — North-Holland mathematics studies, vol. 117. — Notas de matematica, vol. 105. — North-Holland, Amsterdam/New York/Oxford, 1985.

This work begins with an introduction to distributions, Fourier analysis and spectral theory, and develops the transmutation machinery in complete detail. It contains a great deal of new and recent material relative to characterization of transmutations by minimization, by Cauchy and Goursat problems, by spectral pairings, by connections of generalized eigen-functions, by domains, etc.

Claude BERGE. — **Graphs.** — 2nd revised edition. — North-Holland mathematical library, vol. 6, part 1. — Un vol. relié,  $15,5 \times 23$ , de XIII, 413 p. — Prix: Dfl. 150.000. — North-Holland, Amsterdam/New York/Oxford, 1985.

This is the revised and updated version of the first part of the widely referenced text "Graphs and hypergraphs", published by North-Holland in 1973. As graph theory continues its explosive growth, conjectures are proved and new theorems formed. This new edition, therefore, includes new theorems (e.g. the perfect graph theorem, due to Lovasz) as well as new proofs of classical results.

V. G. BOLTJANSKY and I. Ts. GOHBERG. — **Results and problems in combinatorial geometry.** — Un vol. broché,  $13,5 \times 21,5$ , de 112 p. — Prix: £4.95 (relié: £17.50). — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1985.

In this book, the authors discuss three types of problems from combinatorial geometry: Borsuk's partition problem, covering convex bodies by smaller homothetic bodies and the illumination problem. They show how closely related these problems are to each other.

Jean-Pierre ECKMANN and Peter WITWER. — **Computer methods and Borel summability applied to Feigenbaum's equation.** — Lecture notes in physics, vol. 227. — Un vol. broché,  $16,5 \times 24,5$ , de XIV, 297 p. — Prix: DM 36.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This book is an outgrowth of a seemingly trivial question, namely: what happens with the Feigenbaum universality when one restricts attention to functions of  $|x|^{2N}$  (instead of  $x^2$ ), with  $N$  very large? Closer numerical investigation reveals that this question is hard, and that some aspects of the problem must become singular in the limit as  $N \rightarrow \infty$ . In this work, the authors study this singular limit, and sketch its relation to the case of finite, but large  $N$ .

Marc ZAMANSKY. — **Approximation des fonctions.** — Travaux en cours. — Un vol. broché,  $17 \times 24$ , de 104 p. — Prix: FF. 160.00. — Hermann, Paris, 1985.

Après avoir établi des théorèmes généraux relatifs aux développements de Fourier généralisés, Marc Zamansky présente les aspects les plus importants de l'approximation des fonctions, périodiques ou non, d'une ou plusieurs variables réelles. Il expose en même temps l'application des résultats généraux de l'analyse harmonique à la convolution et à l'approximation des fonctions par des convolées, dans le cas de plusieurs indices et plusieurs variables.

Alain DESHAYES. — **Calcul symbolique et informatique: du calcul numérique au calcul littéral, programmes en BASIC.** — Collection «Méthode et programmes». — Un vol. broché, 16 × 24, de XII, 172 p. — Prix: FF. 120.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1985.

L'ouvrage propose des programmes écrits en BASIC permettant d'effectuer par l'intermédiaire d'un micro-ordinateur des calculs littéraux sur des polynômes, que ceux-ci possèdent une ou plusieurs variables au degré égal ou supérieur à  $l$ . La méthode choisie offre une première approche de la programmation structurée, ainsi qu'une initiation progressive à certaines structures de données fondamentales.

Hervé LEHNING. — **Topologie, avec exercices.** — Mathématiques supérieures et spéciales, vol. 1. — Un vol. broché, 16 × 24, de 128 p. — Prix: FF. 55.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1985.

*Borne supérieure:* Structure ordonnée de  $\mathbf{R}$ . — *Suites réelles:* Convergence. Théorèmes d'existence de la limite. — *Topologie de  $\mathbf{R}$ :* Topologie de l'ordre. — *Fonctions réelles:* Continuité. Théorème des fonctions réciproques. Suites de fonctions. — *Topologie de  $\mathbf{C}$ .* — Exercices à la fin de chaque chapitre.

Hervé LEHNING. — **Intégration et sommation, avec exercices.** — Mathématiques supérieures et spéciales, vol. 3. — Un vol. broché, 16 × 24, de 126 p. — Prix: FF. 55.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1985.

*Théorie de l'intégration:* Intégrale propre. Intégration et dérivation. Intégrale impropre. Sens d'une intégrale. *Calculs d'intégrales:* Calcul de primitives. Calcul approché. *Sommation:* Séries numériques. Nature d'une série. Calcul de la somme d'une série. — Exercices à la fin de chaque chapitre.

Jean-François COLOMBEAU. — **Elementary introduction to new generalized functions.** — North-Holland mathematics studies, vol. 113. — Notas de matematica, vol. 103. — Un vol. broché, 16,5 × 24, de XIII, 281 p. — Prix: Dfl. 120.00. — North-Holland, Amsterdam/New York/Oxford, 1985.

*An elementary approach to the new generalized functions:* Generalized functions. Generalized analysis. Some linear Cauchy problems. — *Tempered generalized functions:* The Fourier transform and the tempered generalized functions. The convolution product. Computations on tempered generalized functions. — *New solutions of partial differential equations:* Linear equations. Nonlinear equations. — Appendices.

**Proceedings of the international congress of mathematicians, Warszawa, August 16-24, 1983.** — Edited by Czesław Olech and Zbigniew Ciesielski. — 2 volumes reliés, 18 × 24,5, de LXXII,

1730 p. — Prix: Dfl. 375.00, les deux volumes. — PWN-Polish scientific publishers, Warszawa, and North-Holland, Amsterdam/New York/Oxford, 1984.

The ICM-82 held in Warszawa and 19th in succession, was postponed for one year and took place between August 16-24, 1983. The proceedings contain the texts of the invited addresses and form as a whole, a thorough and fairly complete survey of the present state of mathematical sciences. Out of the 145 invited lectures the book contains 12 plenary addresses and 123 section addresses. Topics varied from the foundations of mathematics, number theory, different aspects of algebra, geometry and analysis, probability theory, differential equations, through applied mathematics (mathematical physics, control theory, numerical mathematics, combinatorics and computer science) to history and education. The proceedings contain reports on the work of each Fields medallist (Alain Connes, William Thurston, Shing-Tung Yau) and of the Nevanlinna prize recipient, Robert Tarjan.

**Cycles in graphs.** — Edited by B. R. Alspach and C. D. Godsil. — North-Holland mathematics studies, vol. 115. — Annals of discrete mathematics, vol. 27. — Un vol. broché,  $16,5 \times 24$ , de x, 468 p. — Prix: Dfl. 160.00. — North-Holland, Amsterdam/New York/Oxford, 1985.

This book grew out of a workshop held at Simon Fraser university. Burnaby, B. C., Canada, 5 July-20 August 1982. This volume deals with a variety of problems involving cycles in graphs and circuits in digraphs. Leading researchers present here 3 survey papers and 42 papers containing new results. There is also a collection of unsolved problems.

Victor G. KAC. — **Infinite dimensional Lie algebras.** — 2nd edition. — Un vol. relié,  $16 \times 23,5$ , de xvii, 280 p. — Prix: £25.00. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1985.

This book contains a detailed exposition of the foundations of the theory of Kac-Moody algebras, a particular class of infinite dimensional Lie algebras and their representations. The most important additions of this 2nd edition reflect recent developments in the theory of infinite-dimensional groups and in the soliton theory. Some important corrections have been made.

Harvey COHN. — **Introduction to the construction of class fields.** — Cambridge studies in advanced mathematics, vol. 6. — Un vol. relié,  $15,5 \times 23,5$ , de x, 213 p. — Prix: £30.00. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1985.

The beginning chapters provide the motivation and necessary background in elementary algebraic number theory and Riemann surface theory. The ideas and results are then applied and extended to class field theory. In the later chapters more specialized results are presented, with full proofs, and the author emphasizes, with examples, the relation of the material to other parts of mathematics.

Jeffrey R. WEEKS. — **The shape of space: how to visualize surfaces and three-dimensional manifolds.** — Pure and applied mathematics, vol. 96. — Un vol. relié,  $16 \times 23,5$ , de x, 324 p. — Prix: \$49.75 (US and Canada), \$59.50 (all other countries). — Marcel Dekker, Inc., New York/Basel, 1985.

Enumerating the fascinating connections between geometry and the physical universe, this introduction graphically depicts topological ideas for complete comprehension. "The shape of

space” complements existing textbooks, which often deal only in abstractions, by offering a wealth of concrete examples.

**Physical mathematics and nonlinear partial differential equations.** — Edited by James H. Lightbourne, III and Samuel M. Rankin, III. — Lecture notes in pure and applied mathematics, vol. 102. — Un vol. broché,  $17,5 \times 25,5$ , de XI, 262 p. — Prix: \$59.75 (US and Canada), \$71.50 (all other countries). — Marcel Dekker, Inc., New York/Basel, 1985.

This volume consolidates the recent research of 26 internationally known mathematicians and provides a thorough discussion of topics such as weak limits of solutions to nonlinear differential equations, models of glacial flow, diffusion equations possessing degeneracies which can produce free boundaries, Gaussian white noise on nonlinear hereditary phenomena... etc.

Philippe BOUGEROL, Jean LACROIX. — **Products of random matrices with applications to Schrödinger operators.** — Progress in probability and statistics, vol. 8. — Un vol. relié,  $15,5 \times 23$ , de X, 283 p. — Prix: FS 74.00. — Birkhäuser, Boston/Basel/Stuttgart, 1985.

This book provides a self-contained introduction to two related topics: limit theorems for products of random matrices and spectral properties of random Schrödinger operators. The 1st part is devoted to the proof of the analogies of the classical limit theorems for products of independent identically distributed invertible random matrices. In the 2nd part, some of these results are applied to the spectral analysis of one dimensional random difference Schrödinger operators.

Douglas QUINNEY. — **An introduction to the numerical solution of differential equations.** — Electronic and electrical engineering research studies, applied and engineering mathematics series. — Un vol. relié,  $16 \times 23,5$ , de XI, 283 p. — Prix: £15.00. — Research studies press, Ltd., Letchworth, Hertfordshire, England, distributed by John Wiley & Sons, Inc., New York/Chichester/Toronto/Brisbane/Singapore, 1985.

The advent of easily programmed computers, of varying sizes, has brought about a revolution in the type of methods available for finding good approximate solutions of differential equations. This book considers some of the techniques which can be employed and also explains why others should not be used.

Johannes ELSCHNER. — **Singular ordinary differential operators and pseudodifferential equations.** — Lecture notes in mathematics, vol. 1128. — Un vol. broché,  $17 \times 24$ , de 200 p. — Prix: DM 31.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This monograph deals with part of the theory of degenerate (non-elliptic) linear differential and integral equations. The book also contains an introduction to pseudodifferential operators on closed curves and the approximation properties of one-dimensional splines.

XIAO, Gang. — **Surfaces fibrées en courbes de genre deux.** — Lecture notes in mathematics, vol. 1137. — Un vol. broché,  $17 \times 24$ , de IX, 103 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This research monograph deals with the classification and structure of complex projective surfaces having a pencil of curves of genus two, notably those of general type. The central and

most interesting result is found in a chapter which presents a complete classification of the cases where the irregularity of the surface is greater than the genus of the base curve.

Adrian OCNEANU. — **Actions of discrete amenable groups on von Neumann algebras.** — Lecture notes in mathematics, vol. 1138. — Un vol. broché, 17 × 24, de v, 115 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This book discusses classification up to outer conjugacy of the automorphic actions of discrete amenable groups on von Neumann algebra factors. Together with important working tools for operator algebras, which have already been applied in von Neumann algebra problems, the book also provides new proofs and insights in classical ergodic theory.

**Recursion theory week.** — Proceedings of a conference held in Oberwolfach, West Germany, April 15-21, 1984. — Edited by H.-D. Ebbinghaus, G. H. Müller, G. E. Sacks. — Lecture notes in mathematics, vol. 1141. — Un vol. broché, 17 × 24, de ix, 418 p. — Prix: DM 57.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The purpose of this Oberwolfach meeting was to survey recent research in recursion theory defined as broadly as possible. The support of the Heidelberger Akademie der Wissenschaften was given with the intention to supplement recent books and monographs on this topic by a selection of up-to-date research papers on a variety of themes of present interest.

**Orders and their applications.** — Proceedings of a conference held in Oberwolfach, West Germany, June 3-9, 1984. — Edited by I. Reiner and K. W. Roggenkamp. — Lecture notes in mathematics, vol. 1142. — Un vol. broché, 17 × 24, de x, 306 p. — Prix: DM 45.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

At the meeting the talks were subdivided under the following headings: Galois module structure, non-abelian class field theory and analytic number theory of orders. — *K*-theory of orders and connection with algebraic geometry. — Applications to group theory and group representations. — Classification of indecomposable lattices. — Applications to applied problems.

Aloys KRIEG. — **Modular forms on half-spaces of quaternions.** — Lecture notes in mathematics, vol. 1143. — Un vol. broché, 17 × 24, de XIII, 203 p. — Prix: DM 31.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

These lecture notes introduce a generalization of the classical theory of elliptic modular forms. The classical theory of Siegel modular forms and that of Hermitian modular forms with respect to the Gaussian number field are presented, and modular forms on half-spaces of quaternions are investigated.

**Knot theory and manifolds.** — Proceedings of a conference held in Vancouver, Canada, June 2-4, 1983. — Edited by D. Rolfsen. — Lecture notes in mathematics, vol. 1144. — Un vol. broché, 17 × 24, de v, 163 p. — Prix: DM 26.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The contributions in this volume of proceedings are research articles on topics ranging from classical and higher-dimensional knot theory, and topology of manifolds, maps and foliations, to some group-theoretic results related to topology.

Gerhard WINKLER. — **Choquet order and simplices with applications in probabilistic models.** — Lecture notes in mathematics, vol. 1145. — Un vol. broché, 17 × 24, de vi, 143 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This research monograph studies Choquet order in a general setting, namely for measure convex subsets of locally convex vector spaces. New properties of Choquet order are derived and then applied to the central new result of these notes, which states that the inverse limit of a countable net of noncompact simplices is a simplex.

**Séminaire d'algèbre Paul Dubreil et Marie-Paule Malliavin.** — Proceedings, Paris, 1983-1984, 36<sup>e</sup> année. — Edité par M.-P. Malliavin. — Lecture notes in mathematics, vol. 1146. — Un vol. broché, 17 × 24, de iv, 420 p. — Prix: DM 57.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The 36th session of this "séminaire" purported to stimulate development in the areas of group and ring theory and to expand the interchange of ideas and contacts among mathematicians from these fields. These proceedings reflect the main activities of the seminar in a series of papers relating to invariant theory and ring theory.

**Universal algebra and lattice theory.** — Proceedings of a conference held at Charleston, July 11-14, 1984. Edited by Stephen D. Comer. — Lecture notes in mathematics, vol. 1149. — Un vol. broché, 17 × 24, de vi, 282 p. — Prix: DM 38.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

One of the themes represented in this volume is the structure of lattices with special properties, e.g., Arguesian lattices, free lattices, convexity lattices, and Boolean algebras with additional operations. Other themes include the study of principal congruence formulas, Mal'cev conditions, the structure of non-finitely based algebras, and the structure of the lattice of interpretability between varieties.

Bernhard KAWOHL. — **Rearrangements and convexity of level sets in PDE.** — Lecture notes in mathematics, vol. 1150. — Un vol. broché, 17 × 24, de v, 136 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

These notes, which grew out of a course given at Brown university, survey some methods providing insight into the geometric shape of solutions to nonlinear elliptic boundary value problems and into the shape of free boundaries. The theory is illustrated by many examples and applications.

Mario WSCHBOR. — **Surfaces aléatoires: mesure géométrique des ensembles de niveau.** — Lecture notes in mathematics, vol. 1147. — Un vol. broché, 17 × 24, de vii, 111 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This research monograph considers certain aspects of the theory of random surfaces. The emphasis is on methods that generalize the classical Rice formula to multiparameter stochastic processes and more broadly, on methods not depending on an order on the parameter space, since this is not usually given in a natural way. Attention is also paid to the local behaviour of the paths of a regular random surface and to a study of the level sets of Wiener surfaces, via their approximation by regular ones.

A. DELGADO, D. GOLDSCHMIDT, B. STELLMACHER. — **Groups and graphs: new results and methods.** — DMV Seminar, Bd. 6. — Un vol. broché, 17 × 24, de 244 p. — Prix: FS 40.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1985.

This set of notes began as a report on a seminar organized by the Deutsche Mathematiker-Vereinigung held in Düsseldorf, 1982. The first part of the book is an exposition of the Bass-Serre theory of groups and graphs. The second part presents the classification of “weak  $(B, N)$ -pairs of rank 2”.

**Graph theory with applications to algorithms and computer science.** — Edited by Y. Alavi, G. Chartrand, L. Lesniak, D. R. Lick, C. E. Wall. — Un vol. relié, 17 × 24, de xv, 810 p. — Prix: £46.00. — John Wiley & Sons, New York/Chichester/Brisbane/Toronto, Singapore, 1985.

This volume constitutes the proceedings of the 5th quadrennial international conference on the theory and applications of graphs with special emphasis on algorithms and computer science applications, held at Western Michigan University in Kalamazoo, Michigan, June 4-8, 1984. Conference participants included research mathematicians and computer scientists from colleges, universities, and the industry.

Helmut STRASSER. — **Mathematical theory of statistics: statistical experiments and asymptotic decision theory.** — De Gruyter studies in mathematics, vol. 7. — Un vol. relié, 18 × 24,5, de XII, 492 p. — Prix: DM 158.00. — Walter de Gruyter, Berlin/New York, 1985.

The aim of this book is to connect the classical parts of mathematical statistics with new developments of asymptotic decision theory. Beginning with an exposition of important results of testing and estimation the book gives an introduction to statistical decision theory and the theory of experiments. The general results are then used to prove the main theorems of asymptotic statistics. A couple of examples both from parametric and from non-parametric inference illustrates the possible applications of the general theory.

David SIEGMUND. — **Sequential analysis: tests and confidence intervals.** — Springer series in statistics. — Un vol. relié, 16 × 24, de XI, 272 p. — Prix: DM 108.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

This book reviews recent developments in sequential analysis, especially those related to repeated significance tests and their application to clinical trials. The development is from first principles, assuming only knowledge of basic statistics and some familiarity with elementary stochastic processes. Each chapter of this book contains problems, which range from elementary to research level.

Kirk M. WOLTER. — **Introduction to variance estimation.** — Springer series in statistics. — Un vol. relié, 16 × 24, de XI, 427 p. — Prix: DM 160.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

This book is about estimating the variances of statistics encountered in large-scale, complex sample surveys. It provides an up-to-date review of the theory and methods of variance estimation, including approximate methods which have been used in practice, but have not appeared previously in the literature. The reader will learn statistically rigorous methods for the analysis of survey data, and a variety of short-cuts and approximations that are helpful.

D. F. ANDREWS, A. M. HERZBERG. — **Data: a collection of problems from many fields for the student and research worker.** — Springer series in statistics. — Un vol. relié, 16 × 24, de xx, 442 p. — Prix: DM 138.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

This unique collection of statistical tables contains a wealth of empirical, theoretically relevant, and fruitful actual data. Statisticians will use it in their discussions of methods and approaches, and it is also an important tool for teachers and students who want to understand the relevance and applicability of specific statistical methods. Altogether, the volume contains more than 100 tables and graphs.

William FULTON, Serge LANG. — **Riemann-Roch algebra.** — Grundlehren der mathematischen Wissenschaften, vol. 277. — Un vol. relié, 16 × 24, de x, 203 p. — Prix: DM 158.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

This book gives a complete exposition of the Grothendieck's Riemann-Roch theorem, and provides an extremely general algebraic formulation. The second half gives a concrete application in the case of sheaves on a fairly general type of scheme. The book contains much material which was not easily obtainable until now.

B. A. DUBROVIN, A. T. FOMENKO, S. P. NOVIKOV. — **Modern geometry: methods and applications, Part II: the geometry and topology of manifolds.** — Translated by Robert G. Burns. — Graduate texts in mathematics, vol. 104. — Un vol. relié, 16,5 × 24, de xv, 430 p. — Prix: DM 158.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

This book is the 2nd in a three-volume introduction to modern geometry. Beginning with a treatment of basic theory of manifolds, this volume explores such topics as Sard's theorem, the degree of a mapping, covering spaces, and fiber bundles. Applications include dynamical systems, homotopy of spheres, and hyperbolic geometry. The presentation is clear, and as concrete as possible.

Serge LANG. —  **$SL_2(\mathbf{R})$ .** — 2nd printing. — Graduate texts in mathematics, vol. 105. — Un vol. relié, 16,5 × 24, de xiv, 428 p. — Prix: DM 138.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

$SL_2(\mathbf{R})$  introduces the infinite dimensional representation theory of semisimple Lie groups by concentrating on one example. This field is of interest not only for its own sake, but for its connections with other areas such as number theory, as exemplified in the work of Langlands. This book makes the theory accessible to a wide audience.

Emil GROSSWALD. — **Representations of integers as sums of squares.** — Un vol. relié, 16 × 24, de xi, 251 p. — Prix: DM 148.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

This theory is intimately related with the number theory of quadratic forms, and the author explains the connection carefully and with the proper historical background. This book is unique in its presentation: it makes the arithmetic theory of quadratic forms accessible to a wide audience by considering a special class of forms (the diagonal forms, i.e. sums of squares).

Wolfgang WALTER. — **Analysis I.** — Grundwissen Mathematik, Bd. 3. — Un vol. broché, 16,5 × 24, de XII, 385 p. — Prix: DM 48.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

*Grundlagen:* Reelle Zahlen. Natürliche Zahlen und vollständige Induktion. Polynome und Wurzeln. — *Grenzwert und Stetigkeit:* Zahlenfolgen. Unendliche Reihen. Grenzwerte von Funktionen und Stetigkeit. Potenzreihen. Elementar-transzendente Funktionen. Komplexe Zahlen und Funktionen. — *Differential- und Integralrechnung:* Das Riemannsche Integral. Differentiation. Anwendungen. Ergänzungen.

Frederick H. SOON. — **Student's guide to "Calculus" by J. Marsden and A. Weinstein, vol. I.** — Un vol. broché, 15,5 × 23,5, de XIV, 312 p. — Prix: DM 48.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

This book runs parallel to Marsden and Weinstein's *Calculus*, vol. 1 and reinforces those concepts introduced by exercises, study hints, and quizzes. Each chapter begins with a section detailing the prerequisites for its study and a quiz on those prerequisites. Detailed solutions of the odd-numbered exercises and sample examinations have been included.

Serge LANG. — **The beauty of doing mathematics: three public dialogues.** — Un vol. broché, 15,5 × 23,5, de XI, 127 p. — Prix: DM 66.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

What does a mathematician do and why? Prime numbers. — A lively activity: to do mathematics. Diophantine equations. — Great problems of geometry and space.

V. S. VARADARAJAN. — **Geometry of quantum theory.** — Second edition. — Un vol. relié, 16,5 × 24, de XVIII, 412 p. — Prix: DM 178.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

This is a book on the foundations of quantum theory. It examines the subject from a point of view that goes back to Heisenberg and Dirac, and whose definitive mathematical formulation is due to von Neumann. This view, which is essentially geometric, leads most naturally to the questions of symmetry that are the basis of all attempts to understand the world of atoms and subatomic particles.

K. CHANDRASEKHARAN. — **Elliptic functions.** — Grundlehren der mathematischen Wissenschaften; Bd. 281. — Un vol. relié, 16 × 23,5, de XI, 189 p. — Prix: DM 138.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The first part of the book provides a self-contained account of the fundamentals of the theory of elliptic functions of Weierstrass and of Jacobi; the close connection with the theory of theta functions and Dedekind's  $n$ -functions is also explained. The proofs of the arithmetical results in the second part are so modelled as to exhibit clearly the analytical relations on which they are based: examples are Euler's theorem on pentagonal numbers, and Gauss's law of quadratic reciprocity.

Ivan Matveevic VINOGRADOV. — **Selected works.** — Prepared by the Steklov Mathematical Institute of the Academy of Sciences of the USSR on the occasion of his 90th birthday. — Edited

by L. D. Faddeev, R. V. Gamkrelidze, A. A. Karacuba, K. K. Mardzhanishvili and E. F. Miscenko. — Translated from the Russian by Naidu Psv. — Un vol. relié, 17 × 25, de VIII, 401 p. — Prix: DM 168.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The works selected for this English language edition provide the reader with a vivid picture of the achievements of this celebrated mathematician. For many of the papers, this is the first time that an English version has been made available; a complete list of all Vinogradov publications is also included in the book.

**Ordered algebraic structures.** — Edited by Wayne B. Powell, Constantine Tsinakis. — Lecture notes in pure and applied mathematics, vol. 99. — Un vol. broché, 18 × 25, de XII, 196 p. — Prix: \$49.75 (USA et Canada), \$59.50 (autres pays). — Marcel Dekker, Inc., New York/Basel, 1985.

The papers contained in this volume constitute the proceedings of the special session on ordered algebraic structures which was held at the 1982 annual meeting of the American mathematical society in Cincinnati, Ohio. This volume includes papers covering such topics as free algebras, word problems, subgroups of ordered groups and their topological properties, ordered rings, and semigroups.

**Differential geometry, calculus of variations and their applications.** — Edited by George M. Rassias, Themistocles M. Rassias. — Lecture notes in pure and applied mathematics, vol. 100. — Un vol. broché, 18 × 25, de XIII, 521 p. — Prix: \$75.00 (USA et Canada), \$90.00 (autres pays). — Marcel Dekker, Inc., New York/Basel, 1985.

This volume contains a series of papers, written by internationally recognized authorities in their fields, dedicated to the memory of Leonhard Euler on the 200th anniversary of his death (1783-1983). These papers deepen our understanding of some of the longstanding research problems of geometry, calculus of variations, and their applications at a level suitable for advanced graduate students and research mathematicians in a variety of fields.

Thomas BETH, Dieter JUNGnickel, Hanfried LENZ. — **Design theory.** — Un vol. relié, 14,5 × 21,5, de 688 p. — Prix: DM 128.00. — Bibliographisches Institut-Wissenschaftsverlag, Mannheim/Wien/Zürich, 1985.

From the foreword: “Although many excellent specialized texts on the different topics of design theory have been published there has been no comprehensive monograph on the field. Thus it was our plan to cover the main concepts and ideas of modern design theory, leading to deeper study of several representative topics... This book... should be suitable as both a text-book for classroom use and a reference book for private study... An extensive bibliography of some 500 titles... has been included”.

Egbert BRIESKORN. — **Lineare Algebra und analytische Geometrie, Bd. II.** — Noten zu einer Vorlesung mit historischen Anmerkungen von Erhard Scholz. — Un vol. relié, 17 × 24,5, de XIV, 534 p. — Prix: DM 48.00. — Friedr. Vieweg & Sohn, Braunschweig/Wiesbaden, 1985.

Der zweite Band des Buches über lineare Algebra und analytische Geometrie hat zwei Gegenstände: Die Klassifikation der Endomorphismen von Vektorräumen und die Theorie der Sesquilinearformen auf Vektorräumen — beide für Vektorräume endlicher Dimension.

Richard E. BELLMAN. — **Selective computation.** — Un vol. relié, 15 × 22, de xvi, 222 p. — Prix: £23.85. — World scientific publishing Co. Pte. Ltd., Singapore, distributed by John Wiley & Sons, Chichester, 1985.

Linear algebraic equations. — Finding the square root of a positive definite matrix. — Largest and smallest characteristic roots. — On the determination of characteristic values for a class of Sturm-Liouville problems. — Linear differential equations with constant coefficients, with variable coefficients. — Nonlinear differential equations. — Asymptotic behavior. — Partial differential equations and dynamic programming, and invariant embedding. — Maximum altitude. — Semigroups in space. — Variational problems and functional equations. — Allocation processes, Lagrange multipliers and the maximum transform. — Appendices.

Harley FLANDERS. — **Single variable calculus.** — Un vol. broché, 20,5 × 25,5, de xii, 648 p. — Prix: £29.95. — W. H. Freeman and Company, New York, 1985.

Functions and graphs. — The derivative. — Applications of differentiation. — Special functions. — Integration. — Techniques of integration. — Applications of integration. — Analytic geometry. — Numerical calculus. — Sequences and series. — Power series. — Answers to odd-numbered exercises.

David S. MOORE. — **Statistics: concepts and controversies.** — 2nd edition. — Un vol. broché, 17 × 23,5, de xvii, 350 p. — Prix: £9.95 (relié: £19.95). — W. H. Freeman and Company, New York, 1985.

This is a statistics book for readers interested in ideas rather than technique. It presents, in nontechnical form, important statistical concepts that are applied in public policy, the human sciences, and everyday life. It will give nonmathematical readers critical insight into the uses and misuses of numbers and quantitative arguments — arguments that are increasingly being used in fields ranging from sociology to medicine to literary analysis.

Philip J. DAVIS et Reuben HERSH. — **L'univers mathématique.** — Traduit et adapté de l'américain par Lucien Chambadal. — Un vol. relié, 18,5 × 26, de x, 406 p. — Prix: FF 220.00. — Gauthier-Villars, Paris, 1985.

Le paysage mathématique. — Diversité de l'expérience mathématique. — Retombées externes. — Retombées internes. — Morceaux choisis en mathématiques. — Enseigner et apprendre. — De la certitude à la faillibilité. — La réalité mathématique.

Michel APPERT et Jacques DEBARBIEUX. — **Problèmes résolus de mathématiques: classes préparatoires (mathématiques supérieures) 1<sup>er</sup> cycle universitaire.** — Dunod université, mathématiques supérieures. — Un vol. broché, 15,5 × 24, de ix, 309 p. — Prix: FF 125.00. — Dunod, Paris, 1985.

Plus de 40 problèmes d'algèbre, analyse et géométrie entièrement corrigés, sont ici présentés en totale conformité avec les nouveaux programmes de mathématiques supérieures. Avant même d'aborder la résolution et pour qu'il apprenne à organiser son temps, l'étudiant est entraîné à la «lecture du sujet», atout indispensable à la réussite d'un examen écrit.

**The mathematics of combustion.** — Edited by John D. Buckmaster. — Frontiers in applied mathematics. — Un vol. relié, 16 × 24, de xii, 254 p. — Prix: £29.90. — Published by the Society

for Industrial and applied mathematics, marketed and distributed by John Wiley & Sons, Chichester, 1985.

*John D. Buckmaster*: An introduction to combustion theory. — *Herschel Rabitz*: Sensitivity analysis of combustion systems. — *F. A. Williams*: Turbulent combustion. — *Wildon Fickett*: Detonation in miniature. — *J. F. Clarke*: Finite amplitude waves in combustible gases.

Ching-Li CHAI. — **Compactification of Siegel moduli schemes.** — London mathematical society lecture note series, vol. 107. — Un vol. broché, 15 × 23, de xvi, 326 p. — Prix: £15.00. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1985.

The Siegel moduli scheme classifies principally polarized abelian varieties, and its compactification is an important result in arithmetic algebraic geometry. The main result of this monograph is to prove the existence of the toroidal compactification over  $Z[1/2]$ .

Paul VER EECKE. — **Applications du calcul différentiel.** — Collection «Mathématiques». — Un vol. broché, 15 × 22, de 393 p. — Prix: FF 280.00. — Paris: Presses universitaires de France, 1985.

Cet ouvrage a pour objet l'exploitation des techniques du calcul différentiel dans les trois domaines suivants: les fonctions implicites, les équations différentielles, le calcul des variations. L'auteur s'est fixé pour objectif la synthèse d'un ouvrage d'actualité, voire d'avant-garde par son niveau d'abstraction, et d'un manuel traditionnel.

**A celebration of statistics. The ISI centenary volume: a volume to celebrate the founding of the International Statistical Institute in 1885.** — Edited by Anthony C. Atkinson and Stephen E. Fienberg. — Un vol. relié, 16 × 24,5, de xv, 606 p. — Prix: DM 138.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

From the foreword: "The International Statistical Institute was founded in 1885 and is therefore one of the world's oldest international scientific societies... As part of its centennial celebration planning the Institute decided to publish a volume of papers representing the immensely wide range of interests encompassed by statistics in its international context, viewed both from a historical and from a contemporary standpoint".

**Maximum-entropy and Bayesian methods in inverse problems.** — Edited by C. Ray Smith and W. T. Grandy, Jr. — Fundamental theories of physics. — Un vol. relié, 17 × 24,5, de ix, 492 p. — Prix: Dfl. 130.00. — D. Reidel publishing company, Dordrecht/Boston/Lancaster, 1985.

This volume is the outcome of two workshops entitled "Maximum-entropy and Bayesian methods in applied statistics", and presents contributions by renowned authorities in many different fields. This volume will be of great interest to mathematicians, physicists, geophysicists, electrical engineers, economists, and those working in communication and information theory and many other aspects of signal processing.

J. P. JURZAK. — **Unbounded non-commutative integration.** — Mathematical physics studies, vol. 7. — Un vol. relié, 16,5 × 24,5, de xx, 191 p. — Prix: Dfl. 120.000. — D. Reidel publishing company, Dordrecht/Boston/Lancaster, 1985.

Non-commutative integration has been limited to the bounded case due to many technical difficulties. Until now all attempts to develop this theory in its unbounded version have been inconclusive and it is the aim of this monograph to present some simple and elegant material adapted to this missing tool of mathematical physics. The mathematical tools developed in this book should be of particular interest for quantum field theory.

**Continuous lattices and their applications.** — Edited by Rudolf-E. Hoffmann and Karl H. Hofmann. — Lecture notes in pure and applied mathematics, vol. 101. — Un vol. broché, 18 × 25, de 392 p. — Prix: \$69.75 (US and Canada), \$83.50 (All other countries). — Marcel Dekker, Inc., New York/Basel, 1985.

Providing an overview of the latest research on continuous lattices and their current applications, this book investigates the ties — induced by the concept of a continuous lattice — between lattice theory, general topology, category theory, logic, functional analysis, and theoretical computer science. This volume contains a bibliography with approximately 700 entries.

Lawrence NARICI, Edward BECKENSTEIN. — **Topological vector spaces.** — Pure and applied mathematics, vol. 95. — Un vol. relié, 18,5 × 26, de 432 p. — Prix: \$69.75 (US and Canada), \$83.50 (All other countries). — Marcel Dekker, Inc., New York/Basel, 1985.

This title provides a detailed survey of functional analysis. It covers such basic principles as the Banach-Steinhaus, Hahn-Banach, and Krein-Milman theorems, and includes a closed graph theorem with an introduction to webbed spaces.

**Handbook of statistics, vol. 5: Time series in the time domain.** — Edited by E. J. Hannan, P. R. Krishnaiah, M. M. Rao. — Un vol. relié, 17 × 24,5, de 496 p. — Prix: Dfl. 275.00. — North-Holland, Amsterdam/New York/Oxford, 1985.

The topics included in this volume are autoregressive-moving average models, control, estimation, identification, model selection, nonlinear time series, non-stationary time series, prediction, robustness, sampling designs, signal attenuation, and speech recognition. This book completes the material included in volume 3 of the series subtitled “Time series in the frequency domain”.

Robert L. VAUGHT. — **Set theory: an introduction.** — Un vol. relié, 17,5 × 24,5, de x, 141 p. — Prix: FS 76.00. — Birkhäuser, Boston/Basel/Stuttgart, 1985.

Sets and relations and operations among them. — Cardinal numbers and finite sets. — The number systems. — More on cardinal numbers. — Orders and order types. — Axiomatic set theory. — Well-orderings, cardinals, and ordinals. — The axiom of regularity. — Logic and formalized theories. — Independence proofs. — More on cardinals and ordinals.

César CAMACHO and Alcides LINS NETO. — **Geometric theory of foliations.** — Translated by Sue E. Goodman. — Un vol. relié, 17,5 × 24,5, de 205 p. — Prix: FS 84.00. — Birkhäuser, Boston/Basel/Stuttgart, 1985.

Differentiable manifolds. — Foliations. — The topology of the leaves. — Holonomy and the stability theorems. — Fiber bundles and foliations. — Analytic foliations of codimension one. — Novikov's theorem. — Topological aspects of the theory of group actions. — Frobenius' theorem. — Exercises.

Werner BALLMANN, Mikhael GROMOV and Viktor SCHROEDER. — **Manifolds of nonpositive curvature.** — Progress in mathematics, vol. 61. — Un vol. relié, 15,5 × 23, de v, 263 p. — Prix: FS 74.00. — Birkhäuser, Boston/Basel/Stuttgart, 1985.

This volume presents a complete and self-contained description of new results in the theory of manifolds of non-positive curvature. It is based on lectures delivered by M. Gromov at the Collège de France in Paris. Among others these lectures treat local and global rigidity problems (e.g. a generalization of the famous Mostow rigidity theorem) and finiteness results for manifolds of finite volume.

Alf JONSSON and Hans WALLIN. — **Function spaces on subsets of  $\mathbf{R}^n$ .** — Edited by Jaak Peetre. — Mathematical reports, vol. 2, part 1. — Un vol. broché, 13 × 21,5, de xiv, 221 p. — Prix: \$48.00. — Harwood academic publishers, Chur/London/Paris/Utrecht/New York, 1984.

Background. — Markov's inequality on  $F$  and  $d$ -sets. — Lipschitz spaces on  $F$  in supremum norm. — An application to generalized Hardy spaces. — The Besov spaces. — The trace theorem for Besov spaces. — The trace of Sobolev and potential spaces. — Further comments on Besov spaces.

C. SMORYNSKI. — **Self-reference and modal logic.** — Universitext. — Un vol. broché, 15,5 × 23,5, de xii, 333 p. — Prix: DM 88.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

The logic of provability: provability as modality. Modal model theory. Arithmetic interpretations of  $PRL$ . — Multi-modal logic and self-reference: bi-modal logics and their arithmetic interpretations. Fixed point algebras. — Non-extensional self-reference: Rosser sentences. An ubiquitous fixed point calculation.

**Model-theoretic logics.** — Edited by J. Barwise and S. Feferman. — Perspectives in mathematical logic. — Un vol. relié, 17,5 × 25, de xviii, 893 p. — Prix: DM 480.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

This is a collection of twenty essays on all aspects of model theoretic logics by the leading authorities in the field. The subject matter of this book constitutes a merging of several directions of work in general model theory over the last twenty-five years. The main topics included are: Basic theory and examples, finitary languages with additional quantifiers, infinitary languages, second-order logic, logics of topology and analysis, advanced topics in abstract model theory.

**On growth and form: fractal and non-fractal patterns in physics.** — Edited by H. Eugene Stanley and Nicole Ostrowsky. — NATO ASI series, series  $E$ : applied sciences, No. 100. — Un vol. relié, 16,5 × 24,5, de x, 308 p. — Prix: Dfl. 115.00 (broché: Dfl. 49.00). — Martinus Nijhoff publishers, Dordrecht/Boston/Lancaster, distributed by D. Reidel publishing company, Dordrecht, 1986.

Within the past few years, there has occurred a remarkable upsurge of progress in understanding the structure of a variety of random "forms" and the fashion in which these forms "grow". The remarkable discovery that forms the basis of this book, is that both phenomena can be related to the properties of simple random walk — indeed, even the quantitative equations from fluid mechanics and electromagnetism can be formally related to the equations describing the motion of a random walk.

**Proceedings of the nineteenth nordic congress of mathematicians, Reykjavik, 1984.** — Edited by Jon R. Stefansson. — Visindafelag Islendinga (Societas scientiarum Islandica), vol. XLIV. — Un vol. relié,  $16 \times 24$ , de 270 p. — Prix: \$20.00. — Commander à: Icelandic mathematical society, Science Institute, Dunhaga 3, IS-107 Reykjavik, Iceland. — Icelandic mathematical society, Reykjavik, 1985.

In the series of Scandinavian congresses of mathematicians, starting in 1909, the 19th congress was the first one to be held in Iceland. The volume contains 24 invited lectures covering various fields of mathematics.

R. E. WHITE. — **An introduction to the finite element method with applications to nonlinear problems.** — A Wiley interscience publication. — Un vol. relié,  $16 \times 24$ , de x, 354 p. — Prix: £40.40. — John Wiley and sons, New York/Chichester/Brisbane/Toronto/Singapore, 1985.

The energy and weak formulations. — The finite element method for two-space-variable problems. — Assembly by nodes and a reduced system matrix. — Shape functions. — Error estimates and existence. — Time-dependent problems. — Numerical solution of nonlinear algebraic systems. — Applications to nonlinear partial differential equations. — Variational inequalities. — Appendixes.

J. BASS. — **Introduction aux mathématiques.** — Un vol. broché,  $17,5 \times 26$ , de 143 p. — Prix: FF 85.00. — Edition marketing, Paris, 1985.

Les nombres. — Topologie. — Limites. — Vecteurs. — Espaces euclidiens. — Angles. — Nombres complexes. — Matrices et déterminants. — Groupes. — Dérivée. — Intégrale. — Cet ouvrage a pour origine des cours faits par l'auteur dans des universités du troisième âge; cependant il s'adresse aussi à quiconque souhaite se remettre à niveau ou faire le point sur ses connaissances mathématiques.

**Geometry today: giornate di geometria, Roma 1984, international conference, Rome, June 4-11, 1984.** — Ed. by E. Arbarello, C. Procesi and E. Strickland. — Progress in mathematics, vol. 60. — Un vol. relié,  $15,5 \times 23$ , de 329 p. — Prix: FS 80.00. — Birkhäuser, Boston/Basel/Stuttgart, 1985.

The proceedings of this conference offer a remarkable view of the state of the art in many fields of geometry, ranging from the theory of algebraic groups to the theory of algebraic curves and their connections with mathematical physics, differential geometry and algebraic topology.

**Ordinary and partial differential equations.** — Proceedings of the eighth conference held at Dundee, Scotland, June 25-29, 1984. — Ed. by B. D. Sleeman and R. J. Jarvis. — Lecture notes in mathematics, vol. 1151. — Un vol. broché,  $16,5 \times 24,5$ , de xiv, 357 p. — Prix: DM 51.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The theme of the conference was the theory of non-linear differential equations and their relevance to the understanding of biological phenomena and non-linear wave propagation. The main topics include: quasilinear wave equations and non-linear wave propagation, inverse methods for reflector imaging, Hilbert's 16th problem, mammalian circadian rhythms, vector models for infectious diseases, biological pattern formation, Hamiltonian systems, excitable media, and symmetry-breaking.

Harold WIDOM. — **Asymptotic expansions for pseudodifferential operators on bounded domains.** — Lecture notes in mathematics, vol. 1152. — Un vol. broché, 16,5 × 24,5, de v, 150 p. — Prix: DM 26.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

Derivation of the series. — The Szegő and heat expansions. — The Hermitian case. — Trace formulas. — Proof of the Szegő expansion in the nonself-adjoint and in the self-adjoint case. — Proof of the heat expansion.

**Probability in Banach spaces V.** — Proceedings of the international conference held in Medford, USA, July 16-27, 1984. — Ed. by A. Beck, R. Dudley, M. Hahn, J. Kuelbs and M. Marcus. — Lecture notes in mathematics, vol. 1153. — Un vol. broché, 16,5 × 24,5, de vi, 457 p. — Prix: DM 64.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The papers covered a broad range of subjects including limit theorems in infinite-dimensional spaces, stochastic processes with particular emphasis on Gaussian and stable processes and martingales, empirical processes, stochastic integrals, random sets, large deviations and random methods in harmonic analysis and functional analysis.

D. S. NAIDU, A. K. RAO. — **Singular perturbation analysis of discrete control systems.** — Lecture notes in mathematics, vol. 1154. — Un vol. broché, 16,5 × 24,5, de x, 195 p. — Prix: DM 31.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

Singular perturbation analysis of difference equations in classical form. — Modelling and analysis of singularly perturbed difference equations in state space form. — Three-time-scale difference equations with application to open-loop optimal control problem. — Singularly perturbed nonlinear difference equations and closed-loop discrete optimal control problem.

**Stability problems for stochastic models.** — Proceedings of the 8th international seminar held in Uzhgorod, USSR, Sept. 23-29, 1984. — Ed. by V. V. Kalashnikov and V. M. Zolotarev. — Lecture notes in mathematics, vol. 1155. — Un vol. broché, 16,5 × 24,5, de vi, 447 p. — Prix: DM 64.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The focal topic of the seminar was the stability of different stochastic models and the problem of stability estimates. The main fields of interest of the participants were: probabilistic metrics, characterization problems, limit theorems, Markov processes, queueing theory, approximation methods, etc. All of the papers included in this volume are of research character.

**Global differential geometry and global analysis 1984.** — Proceedings of a conference held in Berlin, June 10-14, 1984. — Ed. by D. Ferus, R. B. Gardner, S. Helgason and U. Simon. — Un vol. broché, 16,5 × 24,5, de v, 339 p. — Prix: DM 45.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This volume contains the proceedings of a conference which brought together many differential geometers and analysts. The subjects range from spectral geometry and harmonic curvature to pseudo-Riemannian and affine differential geometry, and from minimal surfaces to smoothing procedures for polyhedra.

Harold LEVINE. — **Classifying immersions into  $\mathbf{R}^4$  over stable maps of 3-manifolds into  $\mathbf{R}^2$ .** — Lecture notes in mathematics, vol. 1157. — Un vol. broché, 16,5 × 24,5, de v, 163 p. — Prix: DM 26.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This research monograph studies smooth stable mappings from three dimensional manifolds into the plane. Because of the stability assumption, the singularities of such a map are easy to describe and the quotient space obtained by collapsing to points the connected components of the fibre of the map can be pictured simply.

**Schrödinger operators.** — Lectures given at the 2nd 1984 session of the Centro Internazionale Matematico Estivo (CIME) held at Como, Italy, Aug. 26-Sept. 4, 1984. — Ed. by S. Graffi. — Lecture notes in mathematics, vol. 1159. — Un vol. broché, 16,5 × 24,5, de VIII, 272 p. — Prix: DM 38.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

*S. Agmon:* Bounds on exponential decay of Eigenfunctions of Schrödinger operators. — *V. Enss:* Quantum scattering theory for two- and three-body systems with potentials of short and long range. — *B. Simon:* Some aspects of the theory of Schrödinger operators. — *J. Bellissard:* Stability and instability in quantum mechanics. — *G. Jona-Lasinio:* Some recent applications of stochastic processes in quantum mechanics. — *Kenji Yajima:* The quasi-classical limit of scattering amplitude-finite range potentials.

Peter HENRICI. — **Applied and computational complex analysis, volume 3: Discrete Fourier analysis-Cauchy integrals-construction of conformal maps-univalent functions.** — Pure and applied mathematics. — Un vol. relié, 16 × 23,5, de XIII, 637 p. — Prix: \$61.35 ou: £172.90/\$224.00 les 3 volumes. — John Wiley and sons, New York/London/Sydney/Toronto, 1986.

This volume completes the monumental work of Peter Henrici by introducing a number of major algorithms, applications, and analytical approaches never published before. As in previous volumes, the goal here has been to present complex analysis not merely as a logical structure of beauty and coherence, but as an efficient, useful tool for modeling physical phenomena.

Paul R. GRIBIK, Kenneth O. KORTANEK. — **Extremal methods of operations research.** — Monographs and textbooks in pure and applied mathematics, vol. 97. — Un vol. relié, 16 × 23,5, de VIII, 312 p. — Marcel Dekker, Inc., New York/Basel, 1985.

This text offers a logical progression from elementary concepts to more advanced techniques, providing the necessary solid foundation in linear programming and linear algebra. It discusses specially structured formulations such as the transportation and network models in order to provide practice with stepping-stone tours, range intervals for data, and the transportation paradox before presentation of the simplex method, duality, and sensitivity.

J. G. KALBFLEISCH. — **Probability and statistical inference, vol. 1: probability.** — 2nd edition. — Springer texts in statistics. — Un vol. relié, 16,5 × 24, de XIII, 343 p. — Prix: DM 98.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1985.

While the text has been substantially revised, it retains the characteristics of the earlier editions. The main purpose of the text is to guide the student towards a critical understanding and handling of data sets, and the ensuing testing of hypotheses. This approach distinguishes the book from many other texts which use statistical decision theory as their underlying philosophy.

Jean-Paul DUFOUR. — **Séminaire sud-rhodanien de géométrie: géométrie symplectique et mécanique: rencontre de Balaruc I.** — Collection «Travaux en cours». — Un vol. broché, 17 × 24, de 160 p. — Prix: FF 160.00. — Paris: Hermann, 1985.

Ce volume rassemble des contributions relatives à la mécanique hamiltonienne, à la théorie des variétés de Poisson, aux \*-produits sur les variétés symplectiques... A travers des approches très variées sur ces thèmes apparaît le rôle décisif des techniques de géométrie symplectique dans la formalisation globale d'un large champ d'investigation en plein développement.

Enrico BOMBIERI. — **An introduction to minimal currents and parametric variational problems.** — Mathematical reports, vol. 2, part 3. — Un vol. broché, 13 × 21,5, de VII, pp. 285-384. — Prix: \$25.00. — Harwood academic publishers, Chur/London/Paris/New York, 1985.

Currents and varifolds. — Isoperimetric inequalities and variational formulas. — Variational methods. — The minimal surface equation. — The Bernstein problem.

Roger A. HORN and Charles R. JOHNSON. — **Matrix analysis.** — Un vol. relié, 16 × 24, de XIII, 561 p. — Prix: £35.00. — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1985.

Review and miscellanea. — Eigenvalues, eigenvectors, and similarity. — Unitary equivalence and normal matrices. — Canonical forms. — Hermitian and symmetric matrices. — Norms for vectors and matrices. — Location and perturbation of eigenvalues. — Positive definite matrices. — Nonnegative matrices. — Appendices.

**Trends and developments in the eighties.** — Bielefeld encounters in mathematics and physics IV and V. — Editors: S. Albeverico and Ph. Blanchard. — Un vol. relié, 16 × 22,5, de XII, 424 p. — Prix: £37.75. — World scientific, Singapore, distributed by J. Wiley and sons, Chichester, 1985.

This book collects lecture notes from sessions of the Bielefeld encounters in mathematics and physics IV and V, that took place at the Centre for interdisciplinary research of the University of Bielefeld in July 1982 and September 1983. The overall aim of those meetings was to give a broad view of current activities in mathematical physics as well as some perspectives for developments in the eighties.

**Symposium on anomalies, geometry, topology.** — Edited by William A. Bardeen, Alan R. White. — Sponsored by Argonne national laboratory, Fermi national accelerator laboratory, University of Chicago, March 28-30, 1985. — Un vol. relié, 16 × 22,5, de XVIII, 558 p. — Prix: £55.65. — World scientific, Singapore, distributed by J. Wiley and sons, Chichester, 1985.

This volume contains the proceedings of the Symposium on anomalies, geometry and topology held at Argonne national laboratory and the University of Chicago in March 1985. New developments in superstring theory and the mathematical structure of anomalies dominate the talks. In addition there are sessions devoted to compactification issues, charge fractionalization phenomena and effective lagrangians.

**Finite geometries.** — Edited by Catharine Anne Baker, Lynn Margaret Batten. — Lecture notes in pure and applied mathematics, vol. 103. — Un vol. broché, 16 × 25,5, de XI, 375 p. — Prix: \$69.75 (US/Canada), \$83.50 (Tous les autres pays). — Marcel Dekker, Inc., New York/Basel, 1985.

This book contains the proceedings of a conference held at Saint John's College in Winnipeg. "Finite geometries" focuses on classical geometry, group-theoretic aspects of geometry, combinatorial geometry, diagrams, translation planes, linear spaces, and projective geometry.

Jacqueline LELONG-FERRAND. — **Les fondements de la géométrie.** — Collection «Mathématiques». — Un vol. broché, 15 × 21,5, de 287 p. — Prix: FF 180.00. — Presses universitaires de France, 1985.

Le corps des réels. — Approfondissement de la structure vectorielle. — Approfondissement de la structure affine. — Eléments de géométrie projective. — Reconstruction axiomatique de la géométrie affine ou projective. — Géométrie métrique (euclidienne et non euclidienne). — Exercices.

Rudolf DUTTER. — **Geostatistik: eine Einführung mit Anwendungen.** — Mathematische Methoden in der Technik, vol. 2. — Un vol. broché, 16 × 23,5, de 159 p. — Prix: DM 32.00. — B. G. Teubner, Stuttgart, 1985.

Geostatistik und Anwendungen, Überblick. — Statistische Grundbegriffe. — Regionalisierte Variable. — Das Variogramm. — Varianzen und Regularisierung. — Schätzen von Ressourcen. — Simulation von Lagerstätten. — Literaturverzeichnis. — Tabelle der  $N(0, 1)$ -Verteilung.

Laszlo LEINDLER. — **Strong approximation by Fourier series.** — Un vol. relié, 17 × 24,5, de 209 p. — Prix: \$23.00. — Akadémiai Kiado, Budapest, 1985.

From the preface: "Using today's nomenclature, Hardy and Littlewood proved the first result on strong summability of Fourier series already in 1913. It is very interesting that it took nearly fifty years until Alexits raised some analogous problems in connection with the strong approximation of Fourier series. It is the main motive of my intention to write a monograph which presents a collection of results on this field".

**The influence of computers and informatics on mathematics and its teaching.** — Editorial board: R. F. Churchhouse, B. Cornu, A. G. Howson, J.-P. Kahane, J. H. van Lint, F. Pluvineau, A. Ralston, M. Yamaguti. — ICMI study series. — Un vol. broché, 17 × 24,5, de 155 p. — Prix: £6.50 (relié: £20.00). — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1986.

Proceedings from a symposium held in Strasbourg, France in March 1985 and sponsored by the International Commission on mathematical instruction. The book comprises a report of the meeting, plus several papers contributed to that meeting.

Joseph H. SILVERMAN. — **The arithmetic of elliptic curves.** — Graduate texts in mathematics, vol. 106. — Un vol. relié, 16 × 24,5, de XII, 400 p. — Prix: DM 148.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1986.

Algebraic varieties. — Algebraic curves. — The geometry of elliptic curves. — The formal group of an elliptic curve. — Elliptic curves over finite fields. — Elliptic curves over  $C$ . — Elliptic curves over local fields. — Elliptic curves over global fields. — Integral points on elliptic curves. — Computing the Mordell-Weil group. — Appendices.