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BULLETIN BIBLIOGRAPHIQUE

Solomon G. MIKHLIN, Siegfried PROESSDORF. — **Singular integral operators.** — Un vol. relié, 17 × 25, de 528 p. — Prix: DM 98.00. — Springer-Verlag, Berlin, 1986.

This monograph presents basic aspects of the theory of singular integral operators, both one-dimensional and multidimensional. Also presented are its applications in a modern and largely unified approach using extensively functional analysis methods.

Variational methods for free surface interfaces. — Proceedings of a conference held at Vallombrosa Center, Menlo Park, California, September 7-12, 1985. — Ed. by Paul Concus and Robert Finn. — Un vol. relié, 16,5 × 24, de x, 204 p. — Prix: DM 89.00. — Springer-Verlag, New York, 1987.

This volume contains a selection of contributions that were prepared in connection with a conference which took place during the fall of 1985. Most of the contributions are concerned with classical, but largely unsettled questions and are directed towards mathematicians, physical scientists and engineers.

Jürgen STUECKRAD, Wolfgang VOGEL. — **Buchsbaum rings and applications: an interaction between algebra, geometry and topology.** — Un vol. relié, 17 × 25, de 286 p. — Prix: DM 118.00. — Springer-Verlag, Berlin, 1987.

This book describes interactions between algebraic geometry, commutative and homological algebra, algebraic topology and combinatorics. The main object of study are local Buchsbaum rings. The roots for this theory are located in the desire to have a deeper understanding between "length" and "multiplicity". Insight into these questions has an impressive record of solving old and new problems with the theory of Buchsbaum rings.

Patrick LASCAUX, R. THEODOR. — **Analyse numérique matricielle appliquée à l'art de l'ingénieur, Tome 2.** — Un vol. broché, 15,5 × 22, de XXIV, pp. 402 à 790. — Prix: FF 230.00. — Masson, Paris, 1987.

Ce livre présente dans un langage accessible aux étudiants, techniciens et ingénieurs, une synthèse des méthodes de l'analyse numérique matricielle. Différents aspects de l'évaluation pratique des algorithmes sont présentés: généralité d'application, précision et stabilité aux erreurs d'arrondi, etc.

Paulette LIBERMANN, C. H. MARLE. — **Symplectic geometry and analytical mechanics.** — Mathematics and its applications, vol. 35. — Un vol. relié, 16,5 × 24,5, de XVI, 526 p. — Prix: Dfl. 210.00. — D. Reidel, Dordrecht, 1987.

This book provides an extensive treatment of topics in differential geometry which are the foundations of analytical mechanics, namely symplectic, contact and Poisson structures. Results which have been known for a long time (Darboux's theorem, Hamilton-Jacobi equations, etc.) are treated here in the language of modern differential geometry.

E. HAIRER, S. P. NORSETT, G. WANNER. — **Solving ordinary differential equations I: nonstiff problems.** — Springer series in computational mathematics, vol. 8. — Un vol. relié, 16 × 23, de XIV, 480 p. — Prix: DM 124.00. — Springer-Verlag, Berlin, 1987.

The subject of the book is the solution of nonstiff ordinary differential equations. The first chapter describes the historical development of the classical theory of differential equations. In a second chapter one-step methods are considered. The third chapter begins with the classical theory of multistep methods, treats variable step size and Nordieck methods and their numerical implementation. Many applications from physics, chemistry, biology and astronomy together with computer programs are presented.

Kiyosi ITO: selected papers. — Ed. by Daniel W. Stroock, S. R. S. Varadhan. — Un vol. relié, 16,5 × 24, de XXI, 646 p. — Prix: DM 128.00. — Springer-Verlag, New York, 1987.

This is a comprehensive and nearly complete collection of the scientific papers of Kiyosi Ito. Most of his contributions concern basic problems and questions in the theory of stochastic integration, a branch of probability that was established by Ito himself. Other papers deal with diffusion processes, Brownian motion, excursion theory and stochastic differential equations.

S. BANACH. — **Theory of linear operators.** — North-Holland mathematical library, vol. 38. — English translation of “Théorie des opérateurs linéaires”, 1979. — Un vol. relié, 15,5 × 23, de x, 237 p. — Prix: Dfl. 170.00. — North-Holland, Amsterdam, 1987.

This is a translation of Stefan Banach's classical work. It contains the basics of the algebra of operators, concentrating on the study of linear operators. A new 50-page section (“Some aspects of the present theory of Banach spaces”) complements this monograph.

Recent topics in nonlinear PDE II. — Ed. by Kyuya Masuda, Masayasu Mimura. — North-Holland mathematics studies, vol. 128. — Lecture notes in numerical and applied analysis, vol. 8. — Un vol. broché, 16,5 × 23,5, de VIII, 228 p. — Prix: Dfl. 175.00. — North-Holland, Amsterdam, 1986.

The volume is the result of lectures delivered at the 2nd meeting on the subject of nonlinear partial differential equations, held at Tohoku University, 27-29 February 1984. The topics presented range over various fields of mathematical physics.

A. C. NEWELL, T. RATIU, M. TABOR, Y. ZENG. — **Soliton mathematics.** — Séminaire de mathématiques supérieures, vol. 103. — Un vol. broché, 21,5 × 28, de 116 p. — Prix: Can\$ 18.00. — Presses de l'Université de Montréal, Montréal, 1986.

This paper reports on material discussed in a set of lectures at the Séminaire de mathématiques supérieures. They cover the connection of soliton equations and Lie algebras, the Hirota method and associated conditions, gauge and Bäcklund transformations and the Painlevé method for partial differential equations.

José-Francisco RODRIGUES. — **Obstacle problems in mathematical physics.** — North-Holland mathematics studies, vol. 134. — Notas de matematica, vol. 114. — Un vol. broché, 16,5 × 24, de XVI, 352 p. — Prix: Dfl. 160.00. — North-Holland, Amsterdam, 1987.

The aim of this research monograph is to present a general account of the applicability of elliptic variational inequalities to the important class of free boundary problems of obstacle type from a unifying point of view of classical mathematical physics.

Patterns and waves: qualitative analysis of nonlinear differential equations. — Ed. by Takaaki Nishida, Masayasu Mimura, Hiroshi Fujii. — Studies in mathematics and its applications, vol. 18. — Un vol. relié, 15,5 × 23, de XII, 692 p. — Prix: Dfl. 375.00. — North-Holland, Amsterdam, 1987 and Kinokuniya Co., Ltd, Tokyo, 1986.

The first part of this volume surveys the developments in the analysis of nonlinear phenomena in Japan during the past decade, while the second part consists of up-to-date original papers concerning qualitative theories and their applications. Dealt with here are nonlinear problems related to general analysis, fluid dynamics, mathematical biology and computer sciences, and their underlying mathematical structures.

Ernst-Ulrich GEKELER. — **Drinfeld modular curves.** — Lecture notes in mathematics, vol. 1231. — Un vol. broché, 16,5 × 24, de XIV, 107 p. — Prix: DM 23.00. — Springer-Verlag, Berlin 1986.

This monograph presents a set of new concepts and results of number theory connected with the arithmetics of global function fields. These concepts are generalizations of the notion of abelian variety in number theory. On the other hand, there are some special features whose analogues over number fields are not known, thereby producing interesting questions.

Combinatoire énumérative. — Proceedings of the “Colloque de combinatoire énumérative” held at Université du Québec à Montréal, May 28-June 1, 1985. — Edité par G. Labelle et P. Leroux. — Lecture notes in mathematics, vol. 1234. — Un vol. broché, 16,5 × 24, de XIV, 387 p. — Prix: DM 65.00. — Springer-Verlag, Berlin, 1986.

The topics covered include: survey papers on Young’s work, on Polya theory, and on a new theory of “heaps of pieces”; recent developments in the combinatorial theory of species of structures; applications of enumerative combinatorics to q-series, to orthogonal polynomials, to differential equations, to linear representations of the symmetric group, to the celebrated Macdonald and Jacobian conjectures, etc.

Peter Cornelis SCHUUR. — **Asymptotic analysis of soliton problems: an inverse scattering approach.** — Lecture notes in mathematics, vol. 1232. — Un vol. broché, 16,5 × 24, de VII, 180 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1986.

These notes provide a complete and rigorous description of the emergence of solitons from arbitrary initial conditions associated with various classes of nonlinear partial differential equations solvable by the inverse scattering technique. The book has the character of a research monograph.

Stability problems for stochastic models. — Proceedings of the 9th International Seminar held in Varna, Bulgaria, May 13-19, 1985. — Lecture notes in mathematics, vol. 1233. — Un vol. broché, 16,5 × 24, de VI, 223 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1987.

The subject of the meeting was to discuss in a common forum the topics of general mathematical models and stability of stochastic models. The main tool used in many of the papers is the recently developed theory of probabilistic metrics. The volume includes two survey articles and otherwise research papers.

Séminaire de théorie du potentiel, Paris, n° 8. — Dirigé par M. Brelot, G. Choquet et J. Deny. — Rédacteurs: F. Hirsch et G. Mokobodski. — Lecture notes in mathematics, vol. 1235. — Un vol. broché, 16,5 × 24, de III, 209 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1987.

Ce livre contient 13 exposés par: T. Barth. — H. Ben Saad. — N. Bouleau. — M. El Kory. — M. Hmissi. — G. Lumer. — H. Maagli. — S. Nicaise. — A. de la Pradelle. — M. Selmi. — P. Tortrat.

Rational approximation and its applications in mathematics and physics. — Proceedings, Lancut, 1985. — Edited by J. Gilewicz, M. Pindor, W. Siemaszko. — Lecture notes in mathematics, vol. 1237. — Springer-Verlag, Berlin, 1987.

This workshop, that brought together specialists from East and West, was an opportunity to fill a number of gaps in the field of continued fractions, rational approximation and polynomials. Notable among these is the topic of branched continued fractions practically undiscovered in the West. A detailed survey of convergence theorems for Padé approximants and a survey of recently improved methods and results on global localization of zeros of polynomials are included.

Michael HOLZ, Klaus-Peter PODEWSKI, Karsten STEFFENS. — **Injective choice functions.** — Lecture notes in mathematics, vol. 1238. — Un vol. broché, 16,5 × 24, de vi, 183 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

The book gives a survey of the necessary and sufficient criteria which determine whether a family of sets possesses an injective choice function. In graph theory as well as in transversal theory this problem is known as the marriage problem. This book describes the results of the last ten years in a unified way. Some results are published here for the first time.

Robert I. SOARE. — **Recursively enumerable sets and degrees: a study of computable functions and computably generated sets.** — Perspectives in mathematical logic. — Un vol. relié, 17,5 × 25, de xviii, 437 p. — Prix: DM 68.00. — Springer-Verlag, Berlin, 1987.

A first part of the book constitutes an up-to-date introduction to the theory of computation and recursive function theory, reflecting the development of the subject in the past 20 years. The second part includes a comprehensive study of recursively enumerable sets and their degrees for students and researchers wishing to be brought up to the frontiers of research in recursion theory.

Bifurcation: analysis, algorithms, applications. — **Proceedings of the conference at the University of Dortmund, August 18-22, 1986.** — Edited by T. Küpper, R. Seydel, H. Troger. — International series of numerical mathematics, vol. 79. — Un vol. relié, 17 × 24, de viii, 359 p. — Prix: SFr. 98.00. — Birkhäuser Verlag, Basel, 1987.

In these proceedings an overview of the recent development in analytical and numerical methods of bifurcation theory and its application to natural and engineering sciences is given. For the analytical methods the use of symmetry properties is stressed whereas for the numerical methods the calculation of singularities is still a major theme. Topics relating to the applied sciences and a survey article on applications to theoretical physics are included.

Operators in indefinite metric spaces, scattering theory and other topics. — 10th International Conference on Operator Theory, Bucharest, Romania, August 26-September 5, 1985. — Edited by H. Helson, B. Sz. Nagy, F. H. Vasilescu, D. Voiculescu, Gr. Arsene. — Operator theory: advances and applications, vol. 24. — Un vol. relié, 17 × 24, de 371 p. — Prix: SFr. 98.00. — Birkhäuser Verlag, Basel, 1987.

Several contributed papers focus on the action of linear operators in indefinite metric spaces or reflect modern approaches to scattering theory. Recent advances in operator algebras, dila-

tion theory, invariant subspace problems, spectral theory and in pertaining chapters of functional analysis are also included.

Jakob NIELSEN. — **Collected mathematical papers.** — Edited for the Danish Mathematical Society by Vagn Lundsgaard Hansen. — Contemporary mathematicians. — 2 vol. reliés, 18,5 × 26, de XI, 458 p. et XI, 440 p., respectivement. — Prix: SFr. 332.00. — Birkhäuser, Boston, 1986.

Jakob Nielsen is one of the developers of combinatorial group theory and the topology of surfaces. Available for the first time in English, the present volumes will give greater accessibility to the most important papers of Nielsen and will play a fundamental role in recent investigations on low dimensional topology. The editor has included Nielsen's thesis, his four long memoirs appeared in "Acta Mathematica" from 1927, 1929, 1932, and 1942, with the details of his pioneering work on surface transformations and his famous paper on free groups from 1921.

Shizuo KAKUTANI. — **Selected papers.** — Edited by Robert R. Kallman. — Contemporary mathematicians. — 2 vol. reliés, de XXVII, 448 p. et de VIII, 458 p., respectivement. — Prix: SFr. 456.00. — Birkhäuser, Boston, 1986.

These volumes contain Shizuo Kakutani's own selection of a number of papers that highlight his prolific career in creative mathematics. His clear, concise, aesthetic works are models of mathematical taste, thought, and exposition for us all. The accompanying commentaries, which are found at the end of each volume, demonstrate that his contributions to a very wide range of subjects, for example, ergodic theory, Brownian motion, Banach spaces and fixpoint theory, are extremely relevant to current research.

Walter PURKERT, Hans Joachim ILGAUDS. — **Georg Cantor: 1845-1918.** — Vita Mathematica, Bd. 1. — Un vol. relié, 16 × 23, de 262 p. — Prix: SFr. 48.00. — Birkhäuser Verlag, Basel, 1987.

Das vorliegende Buch hat es sich zum Ziel gestellt, Cantors faszinierende Persönlichkeit möglichst allseitig darzustellen und die Genesis seiner Ideen vor dem Hintergrund der Entwicklung der Mathematik in der zweiten Hälfte des vorigen Jahrhunderts nachzuzeichnen.

Pedro PEREZ CARRERAS, José BONET. — **Barrelled locally convex spaces.** — North-Holland mathematics studies, vol. 131. — Notas de matematicas, vol. 113. — Un vol. broché, 17 × 24, de XVI, 500 p. — Prix: Dfl. 200.00. — North-Holland, Amsterdam, 1987.

This book is a systematic treatment of barrelled spaces, and of structures in which barrelledness conditions are significant. It is a fairly self-contained study of the structural theory of those spaces, concentrating on the basic phenomena in the theory, and presenting a variety of functional-analytic techniques.

Annie CUYT, Luc WUYTACK. — **Nonlinear methods in numerical analysis.** — North-Holland mathematics studies, vol. 136. — Studies in computational mathematics, vol. 1. — Un vol. broché, 16,5 × 24, de X, 278 p. — Prix: Dfl. 120.00. — North-Holland, Amsterdam, 1987.

This book presents several nonlinear techniques resulting mainly from the use of Padé approximants and rational interpolants. The text as it stands is now used for a graduate course in numerical analysis at the University of Antwerp.

Theodore HAILPERIN. — **Boole's logic and probability: a critical exposition from the standpoint of contemporary algebra, logic and probability theory.** — Second edition revised and

enlarged. — Studies in logic and the foundations of mathematics, vol. 85. — Un vol. relié, 16 × 23, de XII, 428 p. — Prix: Dfl. 190.00. — North-Holland, Amsterdam, 1986.

Since the publication of the first edition in 1976, there has been a notable increase of interest in the development of logic, and an accumulation of new results, the chief one being that Boole's work in probability is best viewed not as a new foundational approach but rather as a probability logic.

Gaisi TAKEUTI. — **Proof theory.** — Second edition. — Studies in logic and the foundations of mathematics, vol. 81. — Un vol. relié, 16 × 23, de VIII, 496 p. — Prix: Dfl. 250.00. — North-Holland, Amsterdam, 1987.

Mathematics is a collection of proofs. This is true no matter which standpoint one adopts. One of the most fruitful methods of investigating mathematics is to formalize all the proofs and examine their structures. This text book is devoted to the proof theory inspired by G. Gentzen's work, so called Gentzen-type proof theory.

Goodness-of-fit. — Edited by P. Révész, K. Sarkadi and P. K. Sen. — Colloquia mathematica societatis Janos Bolyai, 45. — Un vol. relié, 17,5 × 24, de 624 p. — Prix: Dfl. 270.00. — North-Holland, Amsterdam, 1987.

The thirty-six papers collected in this volume were originally presented at the Colloquium on Goodness-of-Fit, held in Debrecen, Hungary, in 1984. The subject of the Colloquium was the main research area of the organizer of the meeting, the late Karoly Sardaki. The speakers, from 14 countries, referred frequently to his work and influence.

Differential equations: qualitative theory. — Edited by B. Sz.-Nagy and L. Hatvani. — Colloquia mathematica Janos Bolyai, vol. 47. — Deux vol. reliés, 17,5 × 24, 1172 p. — Prix: Dfl. 360.00. — North-Holland, Amsterdam, 1987.

This volume contains selected papers from the 2nd Colloquium on Qualitative Theory of Differential Equations held in Szeged, Hungary. The majority of the papers included here deal with asymptotic properties and stability problems of solutions of ordinary and functional differential equations. The reader will find articles on the bifurcation of solutions, on boundary value problems, the existence of periodic solutions, etc.

Piotr BLASS, Jeffrey LANG. — **Zariski surfaces and differential equations in characteristic $p > 0$.** — Pure and applied mathematics, vol. 106. — Un vol. relié, 16 × 24, de 456 p. — Prix: \$79.75 (USA et Canada), \$95.50 (tous les autres pays). — Marcel Dekker, New York, 1987.

This book presents the latest developments about Zariski surfaces and related topics, facilitating the application of a wide range of techniques of algebraic geometry through clear examples and explicit computations. It introduces readers to both classical and modern algebraic geometry and provides real research options.

Edward J. ANDERSON, Peter NASH. — **Linear programming in infinite-dimensional spaces: theory and applications.** — Wiley-interscience series in discrete mathematics and optimization. — Un vol. relié, 17 × 24, de XI, 172 p. — Prix: £22.95. — John Wiley and Sons, Chichester, 1987.

This is the first fully comprehensive survey of this topic. It includes a complete treatment of duality theory and of the fundamental theory of simplex-like algorithms for linear programs

posed over vector spaces which may be infinite-dimensional. The approach is inductive, specific problems and algorithms are discussed in detail, and the authors proceed from these to more general concepts and results.

Algebraic D-modules. — Edited by A. Borel *et al.* — Perspectives in mathematics, vol. 2. — Un vol. relié, 16 × 23,5, de XII, 355 p. — Prix: \$29.95. — Academic Press, Boston, 1987.

These notes give a reasonably self-contained exposition of an algebraic version of the theory of holomorphic D-modules, due to A. Beilinson and I. B. Bernstein, in which a D-module is a sheaf of rings of germs of algebraic linear differential operators on a smooth complex quasi-projective variety. The book presents an exposition of the basic notions and operations on D-modules, of special features of coherent, holonomic, and regular holonomic D-modules, and of the Riemann-Hilbert correspondence.

Michal GREGUŠ. — **Third order linear differential equations.** — Mathematics and its applications: East European series. — Un vol. relié, 16 × 23, de xv, 270 p. — Prix: Dfl. 145.00. — D. Reidel Publishing Company, Dordrecht, 1987.

The essential part of the theory of the third order ordinary linear differential equation is presented in this book, which contains a variety of methods, questions, and answers, and solutions to problems encountered within the theory of linear partial differential equations. The last chapter deals with physical and engineering applications of the theory.

B. A. KUPERSHMIDT. — **Elements of superintegrable systems: basic techniques and results.** — Mathematics and its applications. — Un vol. relié, 17 × 24,5, de xv, 187 p. — Prix: Dfl. 116.00. — D. Reidel Publishing Company, 1987.

This is the first detailed introduction to the basic techniques, ideas and results of this recently developed theory. The first half of the text is devoted to the construction and analysis of super Lax equations. The second part deals with various connections between Lie algebras and integrable systems, both super and even. Proofs are provided throughout the book.

Donald J. ALBERS, G. L. ALEXANDERSON, Constance REID. — **International Mathematical Congresses: an illustrated history: 1893-1986.** — Revised edition, including ICM 1986. — Un vol. relié, 22 × 28,5, de 63 p. — Prix: DM 74.00. — Springer-Verlag, New York, 1987.

The illustrated history of the ICM provides the reader with a widely and richly illustrated account of the development of mathematics over the last one hundred years. Although not technical in nature, the book gives an idea of the growth of mathematics and its changing role in the society.

Anthony J. TROMBA. — **Seminar on new results in nonlinear partial differential equations.** — Aspects of mathematics, vol. E10. — Un vol. broché, 16,5 × 23, de VI, 198 p. — Prix: DM 42.00. — Friedr. Vieweg und Sohn, Braunschweig, 1987.

This book consists almost entirely of papers delivered in lectures at the seminar on partial differential equations, held at the Max-Planck-Institut für Mathematik, Bonn in 1984. Some further results are also included. The seminar report ends with a survey of the fundamental results of Teichmüller theory derived from the point of view of elliptic equations and Riemannian geometry.

Johann BAUMEISTER. — **Stable solution of inverse problems.** — Advanced lectures in mathematics. — Un vol. broché, 16,5 × 23, de VIII, 254 p. — Prix: DM 54.00. — Friedr. Vieweg und Sohn, Braunschweig, 1987.

In recent years, inverse modeling in physics, geophysics, medicine and other sciences has become of great importance. This book is intended to give a systematic study of the problems and difficulties in solving inverse problems and to present a unified treatment of illposedness which is inherent in a great number of inverse problems. A comprehensive bibliography is included.

Hervé REINHARD. — **Equations aux dérivées partielles: fondements et applications.** — Dunod université. — Un vol. broché, 15,5 × 24, de X, 262 p. — Dunod, Paris, 1987.

La modélisation des phénomènes étudiés par le physicien, l'électronicien, le mécanicien ou l'économiste fait le plus souvent intervenir des équations aux dérivées partielles. L'auteur s'est efforcé ici de faire le lien entre les énoncés de caractère mathématique et les phénomènes physiques correspondants, ce que les traités théoriques occultent ou supposent connu.

M. B. SEVRYUK. — **Reversible systems.** — Lecture notes in mathematics, vol. 1211. — Un vol. broché, 16,5 × 24, de V, 319 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1986.

Kolmogorov tori of perturbations of integrable reversible diffeomorphisms and vectorfields. — Normal forms for reversible diffeomorphisms and vectorfields near an equilibrium and their Kolmogorov tori. — The behaviour of trajectories of reversible vectorfields near a symmetric cycle. — Structure of resonant zones of reversible diffeomorphisms and vectorfields. — Families of symmetric cycles near an equilibrium of a reversible vectorfield. — Non-autonomous reversible differential equations.

Nonlinear diffusion problems. — Lectures given at the 2nd 1985 Session of the Centro Internazionale Matematico Estivo (CIME), held at Montecatini Terme, Italy, June 10-18, 1985. — Edited by A. Fasano and M. Primicerio. — Lecture notes in mathematics, vol. 1224. — Un vol. broché, 16,5 × 24, de VIII, 188 p. — Prix: DM 28.50. — Springer-Verlag, 1986.

The general theme is the study of the effects of nonlinearity in diffusion problems. Two main topics are considered: diffusion problems with degeneracy and reaction-diffusion models. These lecture notes represent a comprehensive and advanced level survey of these topics covering a variety of aspects, including free boundary problems and sketching open questions.

Inverse problems. — Lectures given at the 1st 1986 Session of the Centro Internazionale Matematico Estivo (CIME), held at Montecatini Terme, Italy, May 28-June 5, 1986. — Edited by G. Talenti. — Lecture notes in mathematics, vol. 1225. — Un vol. broché, 16,5 × 24, de VII, 204 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1986.

The following topics were treated: Inverse eigenvalue problems for second-order and fourth-order Sturm-Liouville differential equations, Fredholm integral equations of the first kind and regularization methods, mathematical problems arising from tomography and related topics, numerical methods for large-scale-ill-posed problems.

Alexandru BUIUM. — **Differential function fields and moduli of algebraic varieties.** — Lecture notes in mathematics, vol. 1226. — Un vol. broché, 16,5 × 24, de IX, 146 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1986.

The aim of this research monograph is to relate Kolchin's Galois theory of algebraic differential equations (ADE's) with the theory of ADE's having no movable singularity. The approach is of interest since it leads to an "infinitesimal" analog of Shimura-Matsusaka theory of fields of moduli, automorphisms in their theory being replaced here by derivations.

Multigrid methods II. — Proceedings of the 2nd European Conference on Multigrid Methods, held at Cologne, October 1-4, 1985. — Edited by W. Hackbusch and U. Trottenberg. — Lecture notes in mathematics, vol. 1228. — Un vol. broché, 16,5 × 24, de vi, 335 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1986.

Most of the papers treat problems arising from fluid- and aerodynamics. New fields of multigrid applications considered here are particle physics and magnetohydrodynamic problems. The papers also look at various "classical" numerical problems in the multigrid context and investigate the performance of multigrid methods on different types of MIMD-multiprocessor computers.

Ola BRATTELI. — **Derivations, dissipations and group actions on C*-algebras.** — Lecture notes in mathematics, vol. 1229. — Un vol. broché, 16,5 × 24, de vi, 277 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1986.

This monograph discusses the theory of derivations and dissipations on C*-algebras with particular emphasis on the classification and generator properties of derivations of dissipations that are well behaved with respect to the action of a locally compact group or a Lie group.

A. Haar memorial conference. — Ed. by J. Szabados and K. Tandori. — Colloquia mathematica societatis Janos Bolyai, vol. 49. — 2 vol. reliés, 17,5 × 24,5, de 474 et 541 p. — Prix: US\$155.50/Dfl. 350.00. — North-Holland, Amsterdam, 1987.

To mark the centenary of one of the greatest Hungarian mathematicians, Alfred Haar, the Janos Bolyai Mathematical Society and the Hungarian Academy of Sciences organized this memorial conference in Budapest, August 1985. The subjects covered were approximation theory, orthogonal series (in particular Haar series), Haar measure and its applications.

Norman L. ALLING. — **Foundations of analysis over surreal number fields.** — North-Holland mathematics studies, vol. 141. — Notas de matematica, vol. 117. — Un vol. broché, 16,5 × 24, de xvi, 374 p. — Prix: US\$66.75/Dfl. 150.00. — North-Holland, Amsterdam, 1987.

In this volume, a tower of surreal number fields is defined, each being a real-closed field having a canonical formal power series structure and many other higher order properties. Topics covered are: the implicit function theorem, the main theorem, analytic functions of surreal and surcomplex variables, etc.

Gregory KARPILOVSKY. — **The Jacobson radical of group algebras.** — North-Holland mathematics studies, vol. 135. — Notas de matematica, vol. 115. — Un vol. broché, 16,5 × 24, de x, 532 p. — Prix: US\$86.75/Dfl. 195.00. — North-Holland, Amsterdam, 1987.

This volume examines the results obtained during the last two decades by researchers on the investigation of ring-theoretic structure of the Jacobson radical $J(FG)$ of FG , when G is a finite group and F a field and when it is known that linear representations of G over F can be interpreted as modules over the group algebra FG .

J. B. COOPER. — **Saks spaces and applications to functional analysis.** — North-Holland mathematics studies, vol. 139. — Notas de matematica, vol. 116. — Un vol. broché, 16,5 × 24, de x, 372 p. — Prix: US\$75.50/Dfl. 170.00. — North-Holland, Amsterdam, 1987.

This second, revised edition of this monograph, which appeared first in 1978, presents a systematic treatment of the theory of Saks spaces, i.e. vector space with a norm and related, subsidiary locally convex topology. Several new sections have been added and some material omitted.

François LIRET, Michel ZISMAN. — **MATHS: Tome 3.** — Dunod Université. — Un vol. broché, 15,5 × 24, de VIII, 421 p. — Paris: Dunod, 1987.

Cet ouvrage s'adresse aux étudiants en 2^e année d'enseignement supérieur en sciences. Soixante-six leçons correspondant au premier semestre abordent les sujets suivants: fonctions de plusieurs variables, fonctions holomorphes, intégrales curvilignes, convergence uniforme, décomposition de Jordan des matrices, etc. De nombreux exercices d'entraînement sont inclus.

Near-rings and near-fields. — Proceedings of a conference held at the University of Tübingen, FRG, 4-10 August 1985. — Ed. by Gerhard Betsch. — North-Holland mathematics studies, vol. 137. — Un vol. broché, 16,5 × 24, de XIV, 298 p. — Prix: US\$62.25/Dfl. 140.00. — North-Holland, Amsterdam, 1987.

Included in these proceedings are two invited lectures: "Non-commutative geometry, near-rings and near-fields" and "Pseudo-finite-near fields" which shows the impressive power of model theoretic methods. The remaining papers cover such topics as D. G. near-rings, radical theory, KT-near-fields, matrix near rings, and applications to systems theory.

Numerical quadrature. — Ed. by M. Mori and R. Piessens. — Un vol. relié, 20 × 27, de 220 p. — Prix: US\$55.50/Dfl. 125.00. — North-Holland, Amsterdam, 1987.

This reprint from the "J. of computational and applied mathematics", vol. 17, nos 1 & 2, is composed of a series of articles giving a representative view of research being undertaken in numerical integration in the West as well as in Japan and in Australia. As a characteristic of numerical integration is the extreme difficulty to solve certain problems (inordinate computation time), considerable research activity in this field is engaged.

Errett BISHOP. — **Selected papers.** — Un vol. relié, 18 × 25,5, de XXIV, 414 p. — Prix: £47.75. — World Scientific Publishing Co., Singapore, 1986, distributed by John Wiley & Sons, Chichester.

This book includes 15 papers by Errett Albert Bishop (1928-1983) whose mathematical work was divided between complex and functional analysis, on the one hand and constructive mathematics on the other. He made fundamental discoveries in each of these areas, and the influence of these discoveries is still strongly felt today. A bibliography of his publications is included.

Douglas BRIDGES, Fred RICHMAN. — **Varieties of constructive mathematics.** — London Mathematical Society lecture note series, vol. 97. — Un vol. broché, 15,5 × 22,5, de x, 149 p. — Prix: £10.95. — Cambridge University Press, Cambridge, 1987.

This is an introduction to the constructive approaches to pure mathematics. The authors emphasise the viewpoint of Errett Bishop's school, but intuitionism, Russian constructive and recursive analysis are also treated, with comparisons between the various approaches included where appropriate.

H. O. CORDES. — **Spectral theory of linear differential operators and comparison algebras.** — London Mathematical Society lecture note series, vol. 76. — Un vol. broché, 15 × 22,5, de IX, 342 p. — Prix: £17.50. — Cambridge University Press, Cambridge, 1987.

The aim of this book is to introduce the reader to the concept of comparison algebra, defined as a type of C^* -algebra of singular integral operators. Topics covered are: spectral theory of differential operators, elliptic second order differential operators, comparison algebras and their importance in solving functional analytic problems involving differential operators.

Serge LANG. — **Linear algebra.** — 3rd edition. — Undergraduate texts in mathematics. — Un vol. relié, 16 × 24, de IX, 285 p. — Prix: DM 78.00. — Springer-Verlag, Berlin, 1987.

This book is intended for a one term course at the Junior or Senior level. It is aimed at the student who has already had some exposure to matrices, determinants, and linear maps. In this new edition, many parts of the book have been rewritten and reorganized, and new exercises have been added.

George K. FRANCIS. — **A topological picturebook.** — Un vol. relié, 16 × 24, de xv, 194 p. — Prix: DM 78.00. — Springer-Verlag, Berlin, 1987.

The purpose of this work is to encourage mathematicians to illustrate their work, and to help artists to understand the abstract ideas expressed by such drawings. The book derives the principles of descriptive topology from Whitney and Thom's theory of singularities and general position. It explains the graphic design of illustrations from Thurston's world of low dimensional geometry and topology.

Ralph N. MCKENZIE, George F. McNULTY, Walter F. TAYLOR. — **Algebras, lattices, varieties. Vol. 1.** — Un vol. relié, 17 × 24,5, de XII, 361 p. — Prix: \$44.95. — Wadsworth & Brooks/Cole Advanced Books and Software, Monterey, Cal., 1987.

This is the first of 4 volumes devoted to the general theory of algebras and the closely related subject of lattice theory. This area of mathematics has grown very rapidly in the past 20 years, problems have become more sophisticated and the results deeper. The tendency towards specialization and fragmentation accompanying this growth has been countered by the emergence of new research themes giving the field a degree of unity it never had before. The book is a survey of all of these aspects.

Didier ROBERT. — **Autour de l'approximation semi-classique.** — Progress in mathematics, vol. 68. — Un vol. relié, 15 × 23,5, de IX, 328 p. — Prix: SFr. 78.00. — Birkhäuser Verlag, Boston, 1987.

This book gives a mathematical description of Bohr's correspondence principle that is based on modern ideas from partial differential equations theories: pseudodifferential and Fourier-integral operators, microlocal analysis, and functional analysis. The core of the book is a study of quantum dynamics by the BKW method with application to the semi-classical approximation of the discrete energy levels for the Schrödinger Hamiltonian.

Mathematical modelling courses. — Editors: J. S. Berry *et al.* — Mathematics and its applications. — Un vol. relié, 17 × 24,5, de 281 p. — Prix: £38.50. — Ellis Horwood, Chichester, distributed by John Wiley & Sons, New York, 1987.

This text is based on papers presented at the 2nd International Conference on the Teaching of Mathematical Modelling and should provide useful help and advice for teachers involved in teaching mathematical modelling.

Numerical analysis. — Proceedings of the 4th IIMAS Workshop held at Guanajuato, Mexico, July 23-27, 1984. — Ed. by J. P. Hennart. — Lecture notes in mathematics, vol. 1230. — Un vol. broché, 16,5 × 24, de x, 234 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1987.

This workshop was the 4th in a series of research workshops on numerical analysis. As in the past, its main topics were numerical optimization, linear algebra and differential equations, both ordinary and partial.

Albrecht PIETSCH. — **Eigenvalues and s-numbers.** — Cambridge studies in advanced mathematics, vol. 13. — Un vol. relié, 15,5 × 23, de 360 p. — Prix: £35.00. — Cambridge University press, Cambridge, 1987.

This book deals with special classes of bounded linear mappings on Banach spaces, such as absolutely p-summing operators and operators of approximation type l_p . The aim is to determine the asymptotic behaviour of their eigenvalues. In addition, an axiomatic theory of traces and determinants is developed.

Seminar on stochastic processes, 1986. — Ed. by E. Cinlar, K. L. Chung, R. K. Gettoor. — Progress in probability and statistics, vol. 13. — Un vol. relié, 15 × 23,5, de 215 p. — Prix: SFr. 52.00. — Birkhäuser, Boston, 1987.

This is the 6th volume reporting on recent progress in stochastic processes. Topics covered are: potential theory of excessive measures, Markov processes with random times of birth and death, Hausdorff measure of Brownian multiple points, packing measure of planar Brownian motion, Schrödinger operator with both given signe values, etc.

Richard J. TRUDEAU. — **The non-Euclidean revolution.** — With an introduction by H. S. M. Coxeter. — Un vol. relié, 16 × 24, de XII, 269 p. — Prix: SFr. 59.00. — Birkhäuser, Boston, 1987.

How unique and definitive is Euclidean geometry in describing the “real” space in which we live? The author confronts the fundamental question of truth and its representation through mathematical models in this work, and questions the possibility of absolute knowledge of the world.

Anatolij N. ANDRIANOV. — **Quadratic forms and Hecke operators.** — Grundlehren der mathematischen Wissenschaften, Band 286. — Un vol. relié, 15,5 × 23,5, de XII, 374 p. — Prix: DM 184.00. — Springer-Verlag, Berlin, 1987.

The subject of the book is the theory of Hecke operators on modular forms of several variables and its applications to the multiplicative arithmetic of modular and quadratic forms. The main results are the explicit decomposition into an Euler product of certain families of Dirichlet series constructed by Fourier coefficients of modular forms and the explicit formulae for the action of Hecke operators on theta-series.

M. GHIL, S. CHILDRESS. — **Topics in geophysical fluid dynamics:** atmospheric dynamics, dynamo theory, and climate dynamics. — Applied mathematical sciences, vol. 60. — Un vol. broché, 15,5 × 23,5, de XV, 485 p. — Prix: DM 88.00. — Springer-Verlag, New York, 1987.

This text applies systematically the successive bifurcations approach to complex time-dependent processes in large scale atmosphere dynamics, geomagnetism, and theoretical climate

dynamics. The authors present recent results on planetary-scale phenomena in the earth's atmosphere, ocean, cryosphere, mantle and core and provide an integrated account of mathematical theory and methods together with physical phenomena and processes.

Alexander GRAHAM. — **Nonnegative matrices and applicable topics in linear algebra.** — Mathematics and its applications. — Un vol. relié, 17 × 24,5, de 264 p. — Prix: £35.00. — Ellis Horwood, Chichester, 1987; distributed by J. Wiley & Sons, New York.

Introductory survey. — Some matrix types. — Positive definite matrices. — Nonnegative matrices. — M-matrices. — Finite Markov chains and stochastic matrices. — Some applications of nonnegative matrices. — Appendix. — Solutions to problems.

Daniel E. COHEN. — **Computability and logic.** — Mathematics and its applications. — Un vol. relié, 17 × 24,5, de 243 p. — Prix: £36.50. — Ellis Horwood, Chichester, 1987; distributed by J. Wiley & Sons, New York.

This account of the theory of computable functions (also called partial recursive functions) and applications in logic provides for those who need theoretical knowledge in parallel with the increasing need to use computers. Some topics covered: Informal theory of computable functions, primitive and partial recursive functions, abacus machines, Turing machines, modular machines, Church's thesis and Gödel's numberings, undecidability and incompleteness, the natural numbers under addition, etc.

Partial differential equations of hyperbolic type and applications. — Ed. by Giuseppe Geymonat. — Un vol. relié, 15,5 × 22, de ix, 178 p. — Prix: £31.80. — World Scientific Publishing, Singapore, 1987; distributed by J. Wiley & Sons, New York.

This volume contains most of the lectures that were to be presented at Torino, Sept. 2-14, 1985, on the occasion of the School on Hyperbolic and Mixed Differential Equations and their Applications which was finally cancelled. Contents: Topics in spectral methods for hyperbolic equations (C. Canuto). — Steady Euler simulations using unstructured meshes (A. Dervieux). — Hyperbolic conservation laws and related topics (T.-P. Liu). — A technique for integrating two-dimensional Euler equations (G. Moretti).

Mathématiques venues d'ailleurs. — Divertissements mathématiques en URSS. — Chroniques extraites de la revue QUANT et adaptées du russe par Jean-Michel Kantor. — Un vol. broché, 18,5 × 23, de 159 p. — Prix: FF 72.00. — Belin, Paris, 1982/UNESCO.

Des résultats fondamentaux obtenus récemment en mathématiques sont expliqués par les auteurs au moyen de divers problèmes regroupés sous les thèmes suivants: Figures et géométrie — Quadrillage et réseaux — Les cheminements mathématiques — Nombres et logique. Les situations familières évoquées montrent la puissance et la nécessité des mathématiques, ne serait-ce que pour bien concevoir des programmes informatiques.

Arthur JONES, Alistair GRAY, Robert HUTTON. — **Manifolds and mechanics.** — Australian Mathematical Society Lecture Series, vol. 2. — Un vol. broché, 15 × 22,5, de 166 p. — Prix: £7.95 (£22.50 relié). — Cambridge University Press, Cambridge, 1987.

This book provides an easy introduction to the theory of differentiable manifolds. The authors show how the theory can be used to develop the theory of Lagrangian mechanics directly from Newton's laws. The book is thus also a basic account of modern mechanics. Applications of the theory to some classical problems are also given.

Algorithms for approximation. — Based on the proceedings of the IMA Conference on Algorithms for the Approximation of Functions and Data held at the Royal Military College of Science, Shrivenham, July 1985. — Edited by J. C. Mason and M. G. Cox. — The Institute of Mathematics and its Applications conference series, vol. 10. — Un vol. relié, 16 × 24, de xvi, 694 p. — Prix: £60.00. — Oxford University Press, Oxford, 1987.

The book has been divided into three primary sections: development of algorithms, applications, and software. The first two of these sections have been subdivided into: spline approximation and smoothing, spline interpolation and shape preservation, multivariate interpolation, least squares methods, rational approximation, complex and nonlinear approximation, computer-aided design and blending, applications in numerical analysis, in partial differential equations and other disciplines.

Daniel BERNOULLI. — **Die Werke von Daniel Bernoulli, Bd. 3: Mechanik.** — Bearbeitet und kommentiert von D. Speiser, A. de Baenst-Vandenbroucke, J. L. Pietenpol, P. Radelet-de-Grave, mit Beiträgen von H. Staub. — Un vol. relié, 19 × 27, de xxvii, 457 p. — Prix: SFr. 188.00. — Birkhäuser-Verlag, Basel/Boston/Stuttgart, 1987.

Dieser Band enthält im ersten Teil Daniel Bernoullis Arbeiten auf dem Gebiet der allgemeinen Punktmechanik und der Mechanik der starren Körper. Sie behandeln Fragen betreffend die Grundlagen der Mechanik, die Erhaltung der Energie und des Drehimpulses, die Dynamik starrer Körper sowie Stoss- und Reibungsprobleme. Im zweiten Teil finden sich zwei Preisschriften über Fragen der angewandten Mechanik, nämlich über die Entstehung des Planetensystems und die Theorie der Gezeiten.

Alfred Tarski: collected papers. — Editors: Steven R. Givant and Ralph N. McKenzie. — Contemporary mathematicians. — 4 vol. reliés, 18 × 26, de 659 p., 682 p. et 757 p. — Prix: SFr. 1.280.00. — Birkhäuser-Verlag, Basel/Boston/Stuttgart, 1986.

A. Tarski was one of the two giants of the 20th century development of logic along with Kurt Gödel. The 4 volumes of this collection contain all of Tarski's published papers and abstracts (but not the books), and include a comprehensive bibliography. Here will be found many of the works, spanning the period 1921 through 1979, which are the bedrock of contemporary areas of logic. These areas include the theory of truth in formalized languages, decision methods and undecidable theories, foundations of geometry, set theory, and model theory, algebraic logic and universal algebra. — *Vol. 1: 1921-1934, vol. 2: 1935-1944, vol. 3: 1945-1957, vol. 4: 1958-1979.* — This collection of the published papers of A. Tarski was conceived as a gift to the author, in connection with the celebration of his 80th birthday.

Kurt Otto Friedrichs: selecta. — Editor: Cathleen S. Morawetz. — Contemporary mathematicians. — 2 vol. reliés, 18 × 26, de 427 p. et 608 p. — Prix: SFr. 380.00. — Birkhäuser-Verlag, Basel/Boston/Stuttgart, 1986.

A selection of papers of K. O. Friedrichs is presented with commentaries on their effect and influence by distinguished colleagues from the relevant field. The vast majority of his papers are in partial differential equations and spectral theory where Friedrichs had the greatest impact, creating new concepts and establishing basic theory. He also made fundamental contributions to the theory of asymptotics, to applied mathematics (elasticity and magneto-hydrodynamics), etc. The selection is preceded by a short biography of Friedrichs by Constance Reid.

Discrete groups in geometry and analysis: papers in honor of G. D. Mostow on his 60th birthday. — Ed. by Roger Howe. — Progress in mathematics, vol. 67. — Un vol. relié, 15 × 23,5, de x, 210 p. — Prix: SFr. 54.00. — Birkhäuser-Verlag, Boston, 1987.

In this volume distinguished authors survey the important role discrete groups currently play in geometry and analysis. The phenomena first brought to light by Mostow's Strong Rigidity Theorem forms the theme of 3 of the 6 papers. Speakers were: P. Deligne, J.-I. Igusa, R. Langlands, J. Millson, M. Mostow, Y.-T. Siu, D. Sullivan and R. Zimmer.

Michael MONASTYRSKY. — **Riemann, topology and physics.** — With a foreword by F. J. Dyson. — Translated by J. King and V. King. — Ed. by R. O. Wells, Jr. — Un vol. relié, 16 × 24, de XIII, 158 p. — Prix: SFr. 68.00. — Birkhäuser-Verlag, Boston, 1987.

This translation of a Russian work consists of a first part dealing with the life and research activity of Bernhard Riemann, who in his relatively short life time, made outstanding contributions to almost all branches of mathematics. In the 2nd part, various applications of topology to contemporary physics are discussed, pertaining mainly to field theory and condensed matter.

Tammo TOM DIECK. — **Transformation groups.** — De Gruyter studies in mathematics, vol. 8. — Un vol. relié, 17,5 × 24,5, de x, 312 p. — Prix: DM 128.00. — Walter de Gruyter, Berlin, 1987.

This monograph is a textbook-type introduction to algebraic topology of compact transformation groups with its relation to representation theory and algebraic K-theory. Emphasis is made upon general methods which are applied to group actions on disks and spheres. The book contains many examples and a large number of exercises ranging from routine problems to relatively difficult ones.

Eli MAOR. — **To infinity and beyond: a cultural history of the infinite.** — Un vol. relié, 17 × 25, de XVI, 275 p. — Prix: SFr. 98.00. — Birkhäuser, Boston, 1987.

The author examines the role of infinity in mathematics and geometry and discusses its cultural impact on the arts and sciences, the profound intellectual impact the infinite has exercised on the human mind. The book is profusely illustrated and is suitable for the scientist or artist, for the historian or educated layman.

Jean-Pierre AUBIN. — **Analyse fonctionnelle appliquée.** — Collection «Mathématiques». — 2 vol. brochés, 15 × 22, de 465 p. — Prix: FF 195.00. — Presses universitaires de France, Paris, 1987.

Cet ouvrage est la traduction française de «Applied abstract analysis», publié par le même auteur en 1979. Dans la première partie sont exposés les théorèmes généraux des espaces vectoriels, dans le cas des espaces de Hilbert. La seconde partie traite de la transformation de Fourier et les espaces de Sobolev de fonctions et de distributions. La troisième partie est une ouverture vers des applications telles que théorie spectrale, produits tensoriels dans les espaces de Hilbert, etc.

Operators in indefinite metric spaces, scattering theory and other topics. — 10th international conference on operator theory, Bucharest (Romania), August 26-September 5, 1985. — Vol. eds.: H. Helson, B. Sz.-Nagy, F.-H. Vasilescu, D. Voiculescu; Managing ed.: Gr. Arsene. — Operator theory: advances and applications, vol. 24. — Un vol. relié, 17 × 24, de 371 p. — Prix: SFr. 98.00. — Birkhäuser-Verlag, Basel, 1987.

This book comprises selected papers in linear operator theory and related fields. Several papers focus on the action of linear operators in indefinite metric spaces or reflect modern approaches to scattering theory. Recent advances in operator algebras, dilation theory,

invariant subspace problems, spectral theory and in pertaining chapters of functional analysis are also included.

Nonlinear and convex analysis: proceedings in honor of Ky Fan. — Ed. by Bor-Luh Lin, Stephen Simons. — Lecture notes in pure and applied mathematics, vol. 107. — Un vol. broché, $17,5 \times 25,5$, de xx, 311 p. — Prix: US\$ 79.95 (US/Canada), US\$ 95.50 (ailleurs). — Marcel Dekker, New York, 1987.

Prof. Ky Fan — a pioneer in nonlinear functional analysis — retired in 1985 from the Department of Mathematics of the University of California at Santa Barbara. In connection with this, a conference was held there and over 30 internationally renowned mathematicians presented over 24 papers on nonlinear and convex analysis, giving readers the opportunity to delve into the latest developments on functional analysis and related topics.

D. E. EDMUNDS, W. D. EVANS. — **Spectral theory and differential operators.** — Oxford mathematical monographs. — Un vol. relié, $15,5 \times 24$ cm, de xvi, 574 p. — Prix: £70.00. — Clarendon Press, Oxford, 1987.

Linear operators in Banach spaces. — Entropy numbers, s -numbers, and eigenvalues. — Unbounded linear operators. — Sesquilinear forms in Hilbert spaces. — Sobolev spaces. — Generalized Dirichlet and Neumann boundary-value problems. — Second-order differential operators on arbitrary open sets. — Capacity and compactness criteria. — Essential spectra. — Essential spectra of general second-order differential operators...

Anne Penfold STREET and Deborah J. STREET. — **Combinatorics of experimental design.** — Un vol. broché, $15,5 \times 23,5$, de xiv, 400 p. — Prix: £15.00 (Broché), £30.00 (Relié). — Clarendon Press, Oxford, 1987.

This textbook relates recent developments in combinatorial theory to the practical needs of statisticians in formulating designs suitable for experimental programmes. For the statistician, it gives an account of direct and recursive methods of construction of combinatorial designs; for the combinatorialist, it explains the statistical motivation for studying particular finite structures.

LUC DEVROYE. — **A course in density estimation.** — Progress in probability and statistics, vol. 14. — Un vol. relié, $15,5 \times 23$, de xix, 183 p. — Prix: SFr. 48.00. — Birkhäuser, Boston, 1987.

This textbook studies the problem of estimating an unknown density from independent, identically distributed data points. Its goal is to develop a well-rounded theory of density estimation in L_1 while maintaining a level of exposition suitable for a first approach to this field. Graduate students in statistics will find this book useful as a basic text for a course in non-parametric density estimation.

Bernard KOLMAN, Robert C. BUSBY. — **Discrete mathematical structures for computer science.** — Second edition. — Un vol. relié, $19,5 \times 24$, de xv, 464 p. — Prentice-Hall, Englewood Cliffs, 1987.

This text has been designed as a complete introduction to discrete mathematics, primarily for computer science majors. Since such a course covers a wide variety of diverse topics, the material has been integrated in such a way that careful motivation of topics and previews of applications have been given special attention.

Complex analytic singularities. — Ed. by T. Suwa and P. Wagreich. — Advanced studies in pure mathematics, vol. 8. — Un vol. relié, 15,5 × 24, de II, 697 p. — Prix: Dfl. 330.00. — Kinokuniya, Tokyo and North-Holland, Amsterdam, 1987.

As a project of the Japan-US Cooperative Science Program a joint seminar on complex analytic singularities was held at Tsukuba University in 1984. In conjunction with this, a symposium on the same subject and a seminar on algebraic geometry were organized at Kyoto and Nagoya. This volume contains most of the papers presented at these meetings.

Homotopy theory and related topics. — Ed. by H. Toda. — Advanced studies in pure mathematics, vol. 9. — Un vol. relié, 15,5 × 24, de XII, 344 p. — Prix: Dfl. 250.00. — Kinokuniya, Tokyo and North-Holland, Amsterdam, 1987.

These papers were presented at the Symposium on homotopy theory held at Kyoto University in December 1984. Topics covered are: Simple homotopy theory and G-actions. — Classifying spaces and characteristic classes. — Topology of manifolds. — Homotopy problems (stable and unstable cases).

R. CAIROLI. — **Algèbre linéaire.** — 2 volumes brochés, 16 × 24, de 165 et 175 p. — Prix: SFr. 34 et SFr. 38. — Presses polytechniques romandes, Lausanne, 1987.

Cet ouvrage s'adresse aux étudiants du premier cycle d'études des écoles d'ingénieurs de niveau universitaire et aux étudiants en mathématiques et physique de première année d'études universitaires orientés vers les applications. Une part importante du texte qui expose et développe les concepts de base de l'algèbre linéaire est consacrée aux motivations, aux interprétations et aux applications.

Gregory KARPILOVSKY. — **The algebraic structure of crossed products.** — North-Holland mathematics studies, vol. 142. — Notas de matematica, vol. 118. — Un vol. broché, 16,5 × 24, de X, 348 p. — Prix: US\$ 71.00/Dfl. 160.00. — North-Holland, Amsterdam, 1987.

In the past years, the foundations of the theory of crossed products have been strengthened and reorganized from new points of view, especially from the viewpoint of graded rings. The purpose of this monograph is to give an up-to-date account of the current state of the subject.

P. M. GRUBER, C. G. LEKKERKERKER. — **Geometry of numbers.** — 2nd ed. — North-Holland mathematical library, vol. 37. — Un vol. relié, 15 × 23, de XV, 732 p. — Prix: US\$ 95.50/Dfl. 215.00. — North-Holland, Amsterdam, 1987.

This second edition was prepared jointly by P. M. Gruber and the author of the first edition. The authors have retained the existing text (with minor corrections) while adding to each chapter supplementary sections on the more recent developments. This method enables to see where recent progress has taken place and in what areas results may be expected in the future.

Logic colloquium '85. — Proceedings of the colloquium held in Orsay, France, July 1985. — Ed. by the Paris logic group. — Studies in logic and the foundations of mathematics, vol. 122. — Un vol. relié, 15,5 × 23, de XIII, 308 p. — Prix: US\$ 80.00/Dfl. 180.00. — North-Holland, Amsterdam, 1987.

Invited addresses presented at the Colloquium report on recent or ongoing research in model theory, both pure and in its applications and proof theory, applied to set theory and diophantine equations. An important place is granted to the connections of mathematical logic with

neighboring disciplines, such as mathematical foundations of computer science and philosophy of mathematics.

S. K. GODUNOV and V. S. RYABENKII. — **Difference schemes: an introduction to the underlying theory.** — Studies in mathematics and its applications, vol. 19. — Un vol. relié, 15,5 × 23, de xvii, 489 p. — Prix: US\$ 77.75/Dfl. 175.00. — North-Holland, Amsterdam, 1987.

Much applied and theoretical research in natural sciences leads to boundary-valued problems stated in terms of differential equations. When solving these problems with computers, the differential problems are replaced approximately by difference schemes. This book is an introduction to the theory of difference schemes and was written as a textbook for university mathematics and physics departments and for technical universities.

A. GARDINER. — **Discovering mathematics: the art of investigations.** — Un vol. relié, 15,5 × 24, de xiv, 206 p. — Clarendon Press, Oxford, 1987.

The word “mathematics” usually conjures up a world of more-or-less familiar problems to be solved by more-or-less familiar techniques. This book examines a very different aspect of mathematics, namely how one can begin to explore *unfamiliar*, fresh ideas and chance observations, how one can pursue them through various stages until the light eventually begins to dawn, and how this whole process invariably throws up other interesting questions one would otherwise never have thought of.

J. WLOKA. — **Partial differential equations.** — Translated by C. B. and M. J. Thomas. — Un vol. broché, 15 × 22,5, de xi, 518 p. — Prix: £17.50 (broché)/£50.00 (relié). — Cambridge University Press, Cambridge, 1987.

This book is a rigorous introduction to the abstract theory of partial differential equations. The author presents different methods available for solving elliptic, parabolic and hyperbolic equations. Much of the book is devoted to boundary value problems, many examples and exercises are provided throughout.

Selected papers on algebra and topology by Garrett Birkhoff. — Ed. by Gian-Carlo Rota and Joseph S. Oliveira. — Contemporary mathematicians. — Un vol. relié, 18,5 × 26, de xvii, 608 p. — Prix: SFr. 138.00. — Birkhäuser, Boston, 1987.

G. Birkhoff is noted for his investigations in algebra, set-theoretic topology, fluid mechanics, nuclear reactor theory and scientific computing. This volume contains his most interesting and influential papers on algebra and topology. They are supplemented by a series of original essays by the author, which present his own reflections on the historical background of the papers and express his views as to their long-term mathematical significance. The author also lists subsequent papers by others who have taken his basic ideas and developed them further.

Classic papers in combinatorics. — Ed. by Ira Gessel, Gian-Carlo Rota. — Un vol. relié, 16 × 24, de x, 490 p. — Prix: SFr. 98.00. — Birkhäuser, Boston, 1987.

This volume surveys the development of combinatorics since 1930 by presenting in chronological order the fundamental results of the subject proved in the original papers. Papers listed are by authors such as: F. P. Ramsey (1930), H. Whitney (1932), P. Erdős and G. Szekeres (1935), P. Hall (1935), etc. through R. L. Graham-K. Leeb-B. L. Rothschild (1972), L. Lovasz (1972), R. P. Stanley (1973), L. Geissinger (1973).

Jacques FARAUT, Khélifa HARZALLAH. — **Deux cours d'analyse harmonique: Ecole d'été d'Analyse harmonique de Tunis, 1984.** — Progress in mathematics, vol. 69. — Un vol. relié, 15,5 × 23,5, de VIII, 293 p. — Prix: SFr. 68.00. — Birkhäuser, Boston, 1987.

The first part of this work, "Analyse harmonique et fonctions spéciales", by J. Faraut, deals with the parallels between classic Euclidean Fourier analysis and harmonic analysis on the Heisenberg group. The 2nd part, "Distributions invariantes", by K. Harzallah, introduces the reader to the study of the distributions on a variety that are invariant with respect to the action of a Lie group.

Geostatistical case studies. — Ed. by G. Matheron and M. Armstrong. — Quantitative geology and geostatistics. — Un vol. relié, 17 × 24,5, de 248 p. — Prix: Dfl. 138.00/US\$ 59.50/£48.50. — D. Reidel, Dordrecht, 1987.

The objective of this volume is to present a series of innovative applications of geostatistics. These range from a variographic analysis of uranium data through detailed studies on geologically complex deposits, up to the latest non-linear methods applied to deposits with highly skew data contributions.

Contributions to the theory and application of statistics: a volume in honor of Herbert Solomon. — Ed. by Alan E. Gelfand. — Un vol. relié, 15,5 × 23,5, de XXVIII, 544 p. — Prix: £44.50/US\$ 59.95. — Academic Press, Boston, 1987.

This volume contains 20 papers dedicated to Herbert Solomon which have been grouped into 4 sections, each defining an area in which he has made significant contributions. These are: Operations research and applied probability, Distribution theory and geometric probability, Applications and Inference methodology. The strength of this volume lies in the distinction of its contributors, each of whom prepared a paper especially for it.

The state of the art in numerical analysis. — Proceedings of the joint IMA/SIAM conference on the state of the art in numerical analysis held at the University of Birmingham, 14-18 April 1986. — Edited by A. Iserles and M. J. D. Powell. — The Institute of Mathematics and its Applications Conference series, vol. 9. — Un vol. relié, 16,5 × 24,5, de XIV, 719 p. — Prix: £55.00. — Clarendon Press, Oxford, 1987.

The 1986 Birmingham conference, third to be held, was a unique occasion for its participants to update their knowledge accross the whole spectrum of numerical mathematics and methods. The 23 talks at the conference are attempting to cover the main developments in all of numerical analysis throughout the decade.

Jean-Marie ARNAUDIES, Henri FRAYSSE. — **Cours de mathématiques 1: Algèbre.** — Un vol. relié, 16,5 × 25, de XX, 691 p. — Dunod, Paris, 1987.

Cet ouvrage réunit les notions de base de l'algèbre fondamentale et de l'algèbre linéaire. Avant tout un outil de travail, plus de mille exercices et près de 300 exemples développés permettent une lecture et une assimilation progressives. Les volumes qui suivront couvriront: l'analyse, l'algèbre bilinéaire et la géométrie, compléments d'analyses.

Beno ECKMANN. — **Selecta.** — Ed. by Max-Albert Knus, Guido Mislin and Urs Stambach. — Un vol. relié, 17,5 × 24,5, de XII, 835 p. — Prix: DM 178.00. — Springer-Verlag, Berlin, 1987.

This volume contains research papers and survey articles written by B. Eckmann from 1941 to the present day. The aim of the compilation is to provide a general view of the breadth of Eckmann's mathematical work. His influence was particularly strong in the development of many subfields of topology and algebra. The topics treated here can be classed in the following areas: algebraic topology, algebra, group theory and differential geometry.

Jacques DOUCHET et Bruno ZWAHLEN. — **Calcul différentiel et intégral, t. 3: Fonctions réelles d'une variable réelle.** — Un vol. broché, 16×24 , de 372 p. — Prix: SFr. 39.80. — Presses polytechniques romandes, Lausanne, 1987.

Ce troisième volume de la série intitulée «Calcul différentiel et intégral» est un recueil de 555 exercices résolus répartis en 9 chapitres dont la numérotation correspond à celle du premier volume. Chaque chapitre est divisé en 2 parties: l'une comprend l'énoncé de l'exercice et l'autre la solution détaillée. Les exercices sont classés, dans la mesure du possible, par sujet ainsi que par ordre croissant de difficulté.

Josze Beck, William W. L. CHEN. — **Irregularities of distribution.** — Cambridge tracts in mathematics, vol. 89. — Un vol. relié, $16 \times 23,5$, de XIV, 294 p. — Prix: £32.50/US\$54.50. — Cambridge University Press, Cambridge, 1987.

This is a description of the various approaches to and methods in the theory of irregularities of distribution. The subject is primarily concerned with number theory, but also borders on combinatorics and probability theory. The work is in 3 parts. The first is concerned with the classical problem; in the second part, the authors study generalizations of the classical problem. The final part is devoted to Roth's "1/4-theorem".

N. H. BINGHAM, C. M. GOLDIE, J. L. TEUGELS. — **Regular variation.** — Encyclopedia of mathematics and its applications, vol. 27. — Un vol. relié, $16,5 \times 24,5$, de XIX, 491 p. — Prix: £50.00/US\$75.00. — Cambridge University Press, Cambridge, 1987.

This book is a comprehensive account of the theory and applications of regular variation. The authors develop the basic ideas of Karamata theory and de Haan theory including many new results and "second-order" theorems and go on to discuss the role of regular variation in Abelian, Tauberian, and Mercerian theorems. These results are then applied in analytic number theory, complex analysis, and probability, with the aim above all of setting the theory in context. A widely scattered literature is thus brought together in a unified approach.

Claude BERGE. — **Hypergraphes: combinatoire des ensembles finis.** — Collection «Mu B». — Un vol. broché, $15,5 \times 24$, de XII, 240 p. — Gauthier-Villars, Paris, 1987.

Issu de l'ouvrage «Graphes et hypergraphes» dont il reprend et actualise la deuxième partie, consacrée aux hypergraphes, ce livre peut être lu par tout étudiant en mathématiques pures et appliquées connaissant les éléments usuels de la théorie des ensembles. Les développements les plus récents sont indiqués.

George PÓLYA. — **The Pólya picture album: encounters of a mathematician.** — Ed. by G. C. Alexanderson. — Un vol. relié, $24,5 \times 23$, de 160 p. — Prix: SFr. 68.00. — Birkhäuser, Boston, 1987.

For many years mathematicians visiting Stanford enjoyed guided tours through the Pólya photograph album. The collection is a highly personal view of the mathematical community of the 20th century. Remarks taken from tapes of Pólya's conversations with his visitors accom-

pany these pictures, so that a wider audience can enjoy this encounter with a man who occupies a special place in mathematics.

Alfréd RÉNYI. — **A diary on information theory.** — Un vol. relié, 15,5 × 23,5, de IX, 125 p. — Prix: £16.50. — John Wiley, Chichester, 1987.

This translation of a work by the late Hungarian mathematician begins with “On the mathematical notion of information” a paper written in the form of a diary, as though a university student just beginning the study of information theory is writing down his thoughts.

Charles W. CURTIS, Irving REINER. — **Methods of representation theory, Vol. 2.** — Pure and applied mathematics, a Wiley-Interscience series of texts, monographs and tracts. — Un vol. relié, 17 × 24, de xv, 951 p. — Prix: £87.15. — John Wiley, New York, 1987.

In this volume, the reader can follow each of the main directions in the current work on the representation theory of finite groups. The subject owes much of its present vitality to the achievements of R. Brauer, J. A. Green, G. Lusztig and R. G. Swan. The authors’ main objective is to present an accessible, self-contained and detailed introduction to their contributions so that the reader can find in one place all that is needed for a thorough understanding of the main results, along with concrete information on how the ideas are applied.

M. M. RAO. — **Measure theory and integration.** — Pure and applied mathematics, a Wiley-Interscience series of texts, monographs and tracts. — Un vol. relié, 16,5 × 24, de XII, 540 p. — Prix: £55.00. — John Wiley, New York, 1987.

Contents: Introduction and preliminaries. Measurability and measures. Measurable functions. Integration. Differentiation and duality. Product measures and integrals. Capacity theory and integration. The lifting theorem. Topological measures. Some complements and applications.

John B. GARNETT. — **Applications of harmonic measure.** — The University of Arkansas lecture notes in mathematical sciences, vol. 8. — Un vol. broché, 16 × 23,5, de VII, 69 p. — Prix: £21.10. — John Wiley, New York, 1987.

Contents: Introduction. Length sums. Level curves of conformal mappings. Interpolating sequences. Nontangential limit sets. Makarov’s theorems. Periodic spectra of Hill’s equation.

Douglas QUINNEY. — **An introduction to the numerical solution of differential equations.** — Revised edition. — Electronic and electrical engineering research studies. Applied and engineering mathematics series, vol. 3. — Un vol. relié, 16 × 23,5, de XI, 283 p. — Prix: £26.00. — Research Studies Press, Letchworth/John Wiley, New York, 1987.

Many mathematical models can be developed in terms of the rates of change of one or more physical variables and naturally result in differential equations. The total number of differential equations which can be solved analytically is very small when compared with all those possible. However, the advent of computers has brought about a revolution in the type of methods available for finding good approximate solutions and this book considers some of the techniques which can be employed.

Non-commutative harmonic analysis and Lie groups. — Proceedings of the International conference held in Marseille-Luminy, June 24-29, 1985. — Ed. by J. Carmona, P. Delorme and M. Vergne. — Lecture notes in mathematics, vol. 1243. — Un vol. broché, 16,5 × 24, de v, 309 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1987.

All the papers in this volume are research papers presenting new results. Most of the results concern semi-simple Lie groups and non-Riemannian symmetric spaces: unitarisation, discrete series characters, multiplicities, orbital integrals. Some also apply to related fields such as Dirac operators and characters in the general case.

Stephen GELBART, Ilya PIATETSKI-SHAPIRO, Stephen RALLIS. — **Explicit constructions of automorphic L-functions.** — Lecture notes in mathematics, vol. 1254. — Un vol. broché, $16,5 \times 24$, de VI, 153 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

The goal of this research monograph is to derive the analytic continuation and functional equation of the L-functions attached by R. P. Langlands to automorphic representations of reductive algebraic groups.

Differential geometry and differential equations. — Proceedings of a symposium, held in Shanghai, June 21-July 6, 1985. — Ed. by Gu Chaohao, M. Berger and R. L. Bryant. — Lecture notes in mathematics, vol. 1255. — Un vol. broché, $16,5 \times 24$, de XII, 243 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1987.

This symposium was both a research symposium and a summer seminar and concentrated on differential geometry. This volume contains a selection of the invited papers and some additional contributions. They cover recent advances and principal trends in current research in differential geometry.

Nonlinear semigroups, partial differential equations and attractors. — Proceedings, Washington D.C. 1985. — Lecture notes in mathematics, vol. 1248. — Un vol. broché, $16,5 \times 24$, de IX, 185 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

This Washington symposium spans a wider range of topics on some recent techniques developed for the investigation of non-linear partial differential equations than previously planned, as it became apparent that the dynamical systems approach interfaced significantly with many important branches of applied mathematics.

Xiaolu WANG. — **On the C^* -algebras of foliations in the plane.** — Lecture notes in mathematics, vol. 1257. — Un vol. broché, $16,5 \times 24$, de V, 165 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

The main result of this original research monograph reveals a close connection between some most recent developments in modern analysis and low-dimensional topology. It introduces non-commutative CW-complexes, among other things, which adds a new aspect to the fast-growing field of noncommutative topology and geometry.

Joachim WEIDMANN. — **Spectral theory of ordinary differential operators.** — Lecture notes in mathematics, vol. 1258. — Un vol. broché, $16,5 \times 24$, de VI, 303 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1987.

These notes give a complete spectral theory for ordinary differential expressions of arbitrary order n operating on C^m -valued functions, existence and construction of self-adjoint realizations via boundary conditions, determination and study of general properties of the resolvent, spectral representation and spectral resolution.

H. KUNITA. — **Lectures on stochastic flows and applications.** — Tata institute of fundamental research lectures on mathematics and physics, vol. 78. — Un vol. broché, $18,5 \times 24,5$, de V, 121 p. — Prix: DM 20.00. — Springer-Verlag, Berlin, 1987.

Contents: Brownian flows. — Stochastic flows and stochastic differential equations. — Limit theorems for stochastic flows. — References. (Notes based on a series of lectures given at the Tata Institute in 1985).

Igor V. SKRYPNIK. — **Nonlinear elliptic boundary value problems.** — Teubner-Texte zur Mathematik, Bd 91. — Un vol. broché, 14,5 × 20,5, de 232 p. — Prix: DM 24.00. — BSB B. G. Teubner, Leipzig, 1986.

The monograph is devoted to topological methods of investigation of nonlinear elliptic boundary value problems and to some problems of the qualitative theory of quasilinear elliptic equations.

Robert J. DAVERMAN. — **Decompositions of manifolds.** — Pure and applied mathematics, vol. 124. — Un vol. relié, 16 × 23,5, de xi, 317 p. — Prix: US\$ 55.00. — Academic Press, Orlando, 1986.

This book is about decomposition, or partitions, of manifolds, usually into cell-like sets. These are compact sets, similar to the contractable ones, that behave homotopically much like points. Equivalently, it is about cell-like mappings defined on manifolds. Material from other topics occasionally will be developed for use when it enhances the central purpose; on the other hand, applications of decomposition theory to the others will be developed as frequently as possible.

Jerome SPANIER, Keith B. OLDHAM. — **An atlas of functions.** — Un vol. relié, 22 × 28,5, de xi, 708 p., 187 figs. — Prix: DM 368.00. — Springer-Verlag, Berlin, 1987.

This atlas is a reference handbook that reveals the behavior of nearly 400 mathematical functions, in terms of their definitions, relationships, expansions, approximations, etc. Important applications are cited. Its special features include easy-to-use algorithms that permit accurate calculation of numerical values of a wide range of functions. Throughout the book, over 180 full-color computer-generated maps offer data useful for up to 3 figures.

Stochastic partial differential equations and applications. — Proceedings of a conference held in Trento, Italy, Sept. 30-Oct. 5, 1985. — Edited by G. Da Prato and L. Tubaro. — Lecture notes in mathematics, vol. 1236. — Un vol. broché, 16,5 × 24, de v, 257 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1987.

Stochastic partial differential equations have been studied by many authors from various points of view, and many results have also emerged from the study of some applications such as filtering theory. The papers included in this proceedings volume are research papers on stochastic differential equations in Banach spaces and related fields like Hida calculus or Malliavin calculus.

Paul VOJTA. — **Diophantine approximations and value distribution theory.** — Lecture notes in mathematics, vol. 1239. — Un vol. broché, 16,5 × 24, de x, 132 p. — Prix: DM 23.00. — Springer-Verlag, Berlin, 1987.

This research monograph describes a formal analogy between the fields of diophantine approximations and value distribution theory for holomorphic functions. By establishing a dictionary, it is shown that the statements of some of the fundamental theorems in diophantine approximation correspond directly with statements in complex analysis.

Number theory. — A seminar held at the Graduate School and University Center of the City University of New York, 1984-85. — Edited by D. V. Chudnovsky, G. V. Chudnovsky, H. Cohn and M. B. Nathanson. — Lecture notes in mathematics, vol. 1240. — Un vol. broché, 16,5 × 24, de v, 324 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1987.

This is the third "Lecture notes" volume to be produced in the framework of the New York Number Theory Seminar. The papers contained here are mainly research papers.

Werner MÜLLER. — **Manifolds with cusps of rank one: spectral theory and L^2 -index theorem.** — Lecture notes in mathematics, vol. 1244. — Un vol. broché, 16,5 × 24, de XI, 158 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

Cusps of rank one. — The heat equation on the cusp. — The Neumann Laplacian on the cusp. — Manifolds with cusps of rank one. — The spectral resolution of H. — The heat kernel. The Eisenstein functions. — The spectral shift function. — The L^2 -index of generalized Dirac operators. — The unipotent contribution to the index. — The Hirzebruch conjecture.

Hodge theory. — Proceedings of the US-Spain workshop held in Sant Cugat (Barcelona), Spain, June 24-30, 1985. — Edited by E. Cattani, F. Guillén, A. Kaplan and F. Puerta. — Lecture notes in mathematics, vol. 1246. — Un vol. broché, 16,5 × 24, de VII, 175 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

Over the past 20 years classical Hodge theory has undergone several generalizations of great interest in algebraic geometry. This volume focuses on those concerning singular and open varieties, families, and the rational homotopy of varieties.

Imme VAN DEN BERG. — **Nonstandard asymptotic analysis.** — Lecture notes in mathematics, vol. 1249. — Un vol. broché, 16,5 × 24, de IX, 187 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

This research monograph is intended both for classical asymptoticists and for nonstandard analysts, but includes topics of general interest, like the remarkable behaviour of Taylor polynomials of elementary functions. Special emphasis is given to applications in numerical approximation by convergent and divergent expansions.

Stochastic processes: mathematics and physics II. — Proceedings of the 2nd BiBoS Symposium held in Bielefeld, West Germany, April 15-19, 1985. — Edited by S. Albeverio, Ph. Blanchard and L. Streit. — Lecture notes in mathematics, vol. 1250. — Un vol. broché, 16,5 × 24, de VI, 359 p. — Prix: DM 57.50. — Springer-Verlag, Berlin, 1987.

In this proceedings volume, particular attention is given to the interaction between mathematics and physics. Main topics include: statistical mechanics, quantum field theory, probability measures, central limit theorems, stochastic differential equations, Dirichlet forms.

Ricardo MANE. — **Ergodic theory and differentiable dynamics.** — Translated from the Portuguese by Silvio Levy. — *Ergebnisse der Mathematik und ihrer Grenzgebiete*, 3. Folge, Bd. 8. — Un vol. relié, 17 × 25, de XII, 317 p. — Prix: DM 148.00. — Springer-Verlag, Berlin, 1987.

The subject of the book is ergodic theory with emphasis on its interaction with the theory of smooth dynamical systems. The first chapter introduces the subjects and aims of the theory. The second develops the more classical tools. The last two chapters study entropy and the ergodic concepts more closely related to smooth dynamical systems (Lyapunov exponents, Oseledec's theorem... etc.), and the ergodic theory of expanding and hyperbolic dynamics.

M. A. SHUBIN. — **Pseudodifferential operators and spectral theory.** — Translated from the Russian by Stig I. Anderson. — Un vol. relié, 16 × 23,5, de x, 278 p. — Prix: DM 148.00. — Springer-Verlag, Berlin, 1987.

The book provides an introduction to the theory of pseudodifferential operators and Fourier integral operators from the very basics. The applications discussed include complex powers of elliptic operators, Hörmander asymptotics of the spectral function and eigenvalues, and methods of approximate spectral projection. Exercises and problems are included.

G. POLYA, R. C. READ. — **Combinatorial enumeration of groups, graphs, and chemical compounds.** — Translated from the German by D. Aeppli. — Un vol. relié, 16 × 24, de vii, 148 p. — Prix: DM 68.00. — Springer-Verlag, New York, 1987.

This book includes a translation of George Polya's famous paper on the combinatorial enumeration of groups, graphs, and chemical compounds and also a commentary on this work by Ronald C. Read. This commentary illuminates the paper of Polya and discusses the advances which have been made on the subject since the paper was written.

Serge LANG. — **Calculus of several variables.** — Third edition. — Undergraduate texts in mathematics. — Un vol. relié, 16,5 × 24, de 590 p. — Prix: DM 116.00. — Springer-Verlag, New York, 1987.

This is a new, revised, edition of this widely known text. All the basic topics in calculus of several variables are covered. The presentation is self-contained, assuming only a knowledge of basic calculus in one variable. Many completely worked-out problems have been included.

L. SCHWARTZ. — **Lectures on complex analytic manifolds.** — Tata Institute of Fundamental Research lectures on mathematics and physics, vol. 4. — Un vol. broché, 19 × 24,5, de iv, 186 p. — Prix: DM 20.00. — Springer-Verlag, Berlin, 1986.

These lectures by Laurent Schwartz were originally published by the Tata Institute in 1955, and are now available again.

J. L. KOSZUL. — **Lectures on fibre bundles and differential geometry.** — Tata Institute of Fundamental Research lectures on mathematics and physics, vol. 20. — Un vol. broché, 19 × 24,5, de iv, 127 p. — Prix: DM 20.00. — Springer-Verlag, Berlin, 1986.

These notes were first published by the Tata Institute in 1960. — Contents: Differential calculus, differentiable bundles, connections on principal bundles, holonomy groups, vector bundles and derivation laws, holomorphic connections.

Ian JACQUES and Colin JUDD. — **Numerical analysis.** — Un vol. broché, 15,5 × 23,5, de vi, 326 p. — Prix: £ 12.00 (relié: £ 25.00). — Chapman and Hall, London, 1987.

This is an introductory text suitable for undergraduates in mathematics. Topics included are the solution of linear and non-linear equations, the algebraic eigenvalue problem, data approximation, numerical integration and the solution of differential equations. The text contains nearly 200 exercises with their solutions.

Ian STEWART, David TALL. — **Algebraic number theory.** — 2nd edition. — Chapman and Hall mathematics series. — Un vol. broché, 14 × 21,5, de xix, 262 p. — Prix: £9.95 (relié: £17.50). — Chapman and Hall, London, 1987.

The authors develop the theory of algebraic numbers and show how this may be applied to various questions in number theory, including a special case of Fermat's last theorem. The treat-

ment is relatively concrete and the exposition is enlivened by material of historical interest, including a very recent breakthrough by G. Faltings, proving the Mordell conjecture.

P. G. N. DIGBY and R. A. KEMPTON. — **Multivariate analysis of ecological communities.** — Population and community biology series. — Un vol. broché, 16 × 24, de VIII, 206 p. — Prix: £13.95 (relié: £25.00). — Chapman and Hall, London, 1987.

This book reviews both established and new techniques of multivariate analysis appropriate to the study of ecological communities. The methods are described by examples and case histories using data from both plant and animal communities. Reference to widely available computer programs makes even the most complex analysis available to the reader.

Marcel BERGER, Bernard GOSTIAUX. — **Géométrie différentielle: variétés, courbes et surfaces.** — Collection «Mathématiques». — Un vol. broché, 15 × 21,5, de 511 p. — Prix: FF 240.00. — Presses universitaires de France, Paris, 1987.

Cet ouvrage essaie d'innover en passant assez vite sur les fondements, pour insister sur les applications plaisantes et spectaculaires de la géométrie différentielle. Les deux derniers chapitres traitent de la théorie des surfaces de l'espace ambiant, un aspect fondamental de la mathématique visible et utile.

Nonlinear parabolic equations: qualitative properties of solutions. — L. Boccardo and A. Tesei, editors. — Pitman research notes in mathematics series, vol. 149. — Un vol. broché, 17 × 24,5, de 232 p. — Prix: £17.50. — Longman Scientific and Technical, Harlow, Essex, UK, 1987.

This collection of invited papers arises from a conference held at the 2nd Rome University in April 1985. The contributions are concerned with recent developments in nonlinear parabolic equations and their equilibrium states. Applications to heat conduction, porous media and population dynamics, are discussed.

Semigroups, theory and applications, vol. 2. — H. Brezis, M. G. Crandall and F. Kappel, editors. — Pitman research notes in mathematics series, vol. 152. — Un vol. broché, 17 × 24,5, de 252 p. — Prix: £16.35. — Longman Scientific and Technical, Harlow, Essex, UK, 1986.

This volume arises from a course held at the International Centre for Theoretical Physics, Trieste, 1984. The aim was to introduce the theory of semigroups and evolution equations and to survey part of the current related knowledge, and to show how to use the abstract results in practical questions related to partial and functional differential equations.

P. MULDOWNNEY. — **A general theory of integration in function spaces including Wiener and Feynman integration.** — Pitman research notes in mathematics series, vol. 153. — Un vol. broché, 17 × 24,5, de 115 p. — Prix: £12.00. — Longman Scientific and Technical, Harlow, Essex, UK, 1987.

This book presents a mathematically rigorous theory of integration and variation in function spaces, including theorems on taking limits under the integral sign. In particular, this book presents a solution to the long-standing problem of providing a rigorous definition and calculus of the Feynman integral in quantum mechanics.

Oakland Conference on Partial Differential Equations and Applied Mathematics. — Louis R. Bragg and John W. Dettman, editors. — Pitman research notes in mathematics series,

vol. 154. — Un vol. broché, $17 \times 24,5$, de 117 p. — Prix: £14.00. — Longman Scientific and Technical, Harlow, Essex, UK, 1987.

These papers were presented at a conference held at Oakland University, Michigan, on May 17, 1986. Four of the papers treat problems in inverse scattering, ocean acoustics, potential theory and energy partitioning by the methods of transmutations, functional analysis and function theory. The fifth paper discusses the clustering of the middle eigenvalues of a matrix equation.

Contributions to nonlinear partial differential equations, vol. 2. — Editors, J. I. Diaz and P. L. Lions. — Pitman research notes in mathematics series, vol. 155. — Un vol. broché, $17 \times 24,5$, de 308 p. — Prix: £19.50. — Longman Scientific and Technical, Harlow, Essex, UK, 1987.

This book contains the proceedings of a Franco-Spanish meeting devoted to nonlinear partial differential equations held at the Université de Paris-Dauphine, Paris in December 1985. These communications provide a comprehensive survey of recent results and applications in the field.

A. C. McBRIDE. — **Semigroups of linear operators: an introduction.** — Pitman research notes in mathematics, series vol. 156. — Un vol. broché, $17 \times 24,5$, de 134 p. — Prix: £14.00. — Longman Scientific and Technical, Harlow, Essex, UK, 1987.

This book provides a short and fairly gentle introduction to the topic. No prior knowledge of functional analysis is assumed, and technicalities from Lebesgue integration and probability theory are kept to a minimum. Four examples are used throughout: semigroups of translations, the Gauss-Weierstrass semigroup, the Cauchy-Poisson semigroup and semigroups of fractional integrals.

Jonathan S. GOLAN. — **Linear topologies on a ring: an overview.** — Pitman Research notes in mathematics series, vol. 159. — Un vol. broché, $17 \times 24,5$, de 104 p. — Prix: £13.00. — Longman Scientific and Technical, Harlow, Essex, UK, 1987.

Linear topologies on a noncommutative ring R are determined by “topologizing” filters of left ideals of R . This book presents a unified study of the set of all such filters, with emphasis on the interplay between the order and algebraic structures naturally defined on it.

Dynamical systems and bifurcation theory. — M. I. Camacho, M. J. Pacifico and F. Takens, editors. — Pitman research notes in mathematics series, vol. 160. — Un vol. broché, $17 \times 24,5$, de 421 p. — Prix: £25.00. — Longman Scientific and Technical, Harlow, Essex, UK, 1987.

This volume contains papers arising from a meeting held at the Federal University of Rio de Janeiro in August 1985. It presents contributions in the field of dynamical systems, with special emphasis on questions concerning structural stability of vector fields and bifurcation theory. Results for polynomial foliations and complex vector fields and foliations are also reported, in addition to dynamical aspects of lines of curvature and geodesic flows.

Dieter GAIER. — **Lectures on complex approximation.** — Translated by Renate McLaughlin. — Un vol. relié, $16,5 \times 24$, de ix, 196 p. — Prix: Sfr. 78.00. — Birkhäuser, Boston, 1987.

The first part of the book deals with the classical theory of approximation in the complex domain, characterized by L^2 -expansions, the Bergman kernel function, Faber polynomials, and

interpolation. The second part contains more modern results such as the theorems of Mergelyan, Alice Roth, Arakeljan, and Nersesjan, as well as applications to the construction of holomorphic functions with complicated boundary behavior.

Reinhold REMMERT, Peter ULLRICH. — **Elementare Zahlentheorie.** — Un vol. broché, 16,5 × 23,5, de 275 p. — Prix: Sfr. 42.00. — Birkhäuser Verlag, Basel, 1987.

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

Max KOECHER. — **Klassische elementare Analysis.** — Un vol. broché, 16,5 × 23,5, de 211 p. — Prix: Sfr. 38.00. — Birkhäuser Verlag, Basel, 1987.

Dieses Buch zeigt vielfältige Anwendungsmöglichkeiten der zentralen Sätze der Infinitesimalrechnung einer Variablen auf Probleme der elementaren Analysis. Der Leser soll zu einer Beschäftigung mit Mathematik stimuliert werden, gleichzeitig werden damit aber die Begriffsbildungen der reellen Analysis auf viele Weisen motiviert.

Mervyn STONE. — **Coordinate-free multivariable statistics: an illustrated geometric progression from Halmos to Gauss and Bayes.** — Oxford statistical science series, vol. 2. — Un vol. relié, 16 × 24, de XIV, 120 p. — Prix: £20.00. — Oxford University Press, Oxford, 1987.

This elementary, self-contained book overcomes the well-known obstacles to full and proper deployment of the geometrical approach to linear statistical method. Topics covered range from the general linear model of Gauss, via Bayes estimation, to the Kalman filter. The book's main novelty lies in its consistent use of separate, dual vector spaces for "variables" and "individuals", and of covariance operators as bridges between them. The necessary linear algebra for this is included.

Sandor KLEIN. — **The effects of modern mathematics.** — Un vol. relié, 17 × 24, de 436 p. — Prix: \$48.00. — Akadémiai Kiado, Budapest, 1987.

The present book contains the results of a scientific investigation conducted in four countries (the USA, Canada, Brazil and Hungary), following up the effects on elementary school children of the new approach to mathematics learning deriving from Prof. Zoltan P. Dienes' work. Most of the investigations focus on the psychological effects of the new approach.

P. HENRICI, R. JELTSCH. — **Komplexe Analyse für Ingenieure**, Bd. 1 und 2. — Birkhäuser Skripten, Bd. 6 und 7. — 2 vol. brochés, 20 × 24 cm, de respectivement 228 p. et 160 p. — Prix: Sfr. 25.00 (Bd. 1) et Sfr. 29.80 (Bd. 2). — Birkhäuser Verlag, Basel, 1987.

Bd. 1: Komplexe Funktionen einer komplexer Variablen. — Die Möbius-Transformationen. — Analytische Funktionen. — Lösung ebener Potentialprobleme durch konforme Abbildung. — *Bd. 2:* Komplexe Integration. — Die Laplace-Transformation.

Surveys in combinatorics 1987. — Invited papers for the eleventh British Combinatorial Conference. — Edited by C. Whitehead. — London Mathematical Society lecture note series, vol. 123. — Un vol. broché, 15 × 23, de 226 p. — Prix: £15.00. — Cambridge University Press, Cambridge, 1987.

The lectures survey many areas of current research activity in combinatorics, both theoretical and applicable, including graph theory, enumeration, and the theory of designs. The papers develop links between combinatorics and other areas of mathematics, such as set theory, topology, number theory and computer science.

Ralph FREESE, Ralph MCKENZIE. — **Commutator theory for congruence modular varieties.** — London Mathematical Society lecture note series, vol. 125. — Un vol. broché, 15 × 23, de 227 p. — Prix: £17.50. — Cambridge University Press, Cambridge, 1987.

Written for researchers and advanced graduate students in universal algebra, this book adopts a more algebraic approach of the commutator theory for congruence modular varieties than previous accounts. Topics covered include Gumm's Mal'cev condition for congruence modularity, nilpotent algebras, congruence identities, rings associated with modular varieties, and structure and representation of algebras. The final chapter displays an infinite class of identities defined by Mal'cev conditions, and discusses a new finite basis theorem.

Walter LEDERMANN. — **Introduction to group characters.** — 2nd edition. — Un vol. broché, 15,5 × 23, de x, 227 p. — Prix: £8.95 (relié: £27.50). — Cambridge University Press, Cambridge, 1987.

The only prerequisites to read this book are a standard knowledge of linear algebra and a modest acquaintance with group theory. Especial care has been taken to explain how group characters are computed. For the 2nd edition, the author has included further work on tensor products, arithmetical properties of character values and the Frobenius-Schur criterion for real representations.

Directions in partial differential equations. — Proceedings of a symposium conducted by the Mathematics Research Center, the University of Wisconsin-Madison, October 28-30, 1985. — Edited by Michael G. Crandall, Paul H. Rabinowitz, Robert E. L. Turner. — Publication of the Mathematics Research Center, the University of Wisconsin-Madison, vol. 54. — Un vol. relié, 16 × 23,5, de XIV, 244 p. — Prix: \$29.95. — Academic Press, Boston, 1987.

Topics covered include recent contributions to the calculus of variations, differential geometry, the study of the development of singularities, regularity theory, hydrodynamics, mathematical physics, asymptotic behavior, critical point theory, the use of probabilistic methods, the modern theory of Hamilton-Jacobi equations, the interaction between theory and numerical methods for partial differential equations, and attempts to understand oscillatory phenomena in solutions of nonlinear equations.

Herbert BUSEMANN, B. B. PHADKE. — **Spaces with distinguished geodesics.** — Pure and applied mathematics, vol. 108. — Un vol. relié, 16 × 23,5, de VIII, 159 p. — Prix: \$49.75 (USA et Canada), \$59.50 (pour le reste du monde). — Marcel Dekker, Inc., New York, 1987.

This book develops in detail the theory proposed by H. Busemann in 1955. It incorporates methods that are synthetic and a treatment that is axiomatic, allowing those unfamiliar with the technical notation of differential geometry to understand. It also provides complete proofs of many theorems, permitting arguments to be followed without having to look up a large number of journal articles.

Jonathan L. GROSS, Thomas W. TUCKER. — **Topological graph theory.** — Wiley inter-science series in discrete mathematics and optimization. — Un vol. relié, 17 × 24, de xv, 351 p. — Prix: £55.00. — John Wiley and Sons, New York, 1987.

This book focuses on the exposition and application of general topological methods to graph imbeddings, providing numerous examples. Discussion of imbeddings into surface is blended with a complete proof of the classification of closed surfaces. Voltage graphs are also discussed in acknowledgement of the role of covering space constructions as the single most important tool used in the derivation of genus formulas.

Differential geometric methods in mathematical physics. — Proceedings of the 14th international conference held in Salamanca, Spain, June 24-29, 1985. — Edited by P. L. Garcia and A. Pérez-Rendón. — Lecture notes in mathematics, vol. 1251. — Un vol. broché, 16,5 × 24, de VII, 300 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1987.

The focal topic of the conference was that of mathematical problems in classical field theory and the emphasis of the resulting proceedings volume is on superfield theory and related topics, and classical and quantized fields.

Jürgen FISCHER. — **An approach to the Selberg trace formula via the Selberg zeta-functions.** — Lecture notes in mathematics, vol. 1253. — Un vol. broché, 16,5 × 24, de III, 184 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

The notes give a direct approach to the Selberg zeta-function for cofinite discrete subgroups of $SL(2, \mathbb{R})$ acting on the upper half-plane. The basic idea is to compute the trace of the iterated resolvent kernel of the hyperbolic Laplacian in order to arrive at the logarithmic derivative of the Selberg zeta-function.

Pseudo-differential operators. — Proceedings of a conference held in Oberwolfach, February 2-8, 1986. — Edited by H. O. Cordes, B. Gramsch and H. Widom. — Lecture notes in mathematics, 1256. — Un vol. broché, 16,5 × 24, de X, 479 p. — Prix: DM 73.00. — Springer-Verlag, Berlin, 1987.

Thirty-five lectures were given on a wide variety of topics, including the following: nonlinear hyperbolic equations, pseudo-differential operator calculus and asymptotic expansions, operators on manifolds with singularities, boundary value problems, Fourier integral operators, Toeplitz operators and index theory, Fréchet algebras, LP boundedness. The papers in this volume are, with a few exceptions, expanded versions of lectures given during the conference.

Séminaire de probabilités XXI. — Edité par J. Azéma, P. A. Meyer et M. Yor. — Lecture notes in mathematics, vol. 1247. — Un vol. broché, 16,5 × 24, de IV, 579 p. — Prix: DM 98.00. — Springer-Verlag, Berlin, 1987.

Extrait de la table des matières: D. W. Stroock: Homogeneous chaos revisited. — P. A. Meyer et J. A. Yan: A propos des distributions sur l'espace de Wiener. — J. A. Yan: Développement des distributions suivant les chaos de Wiener et applications à l'analyse stochastique. — P. A. Meyer: Éléments de probabilités quantiques (exposés 6-7-8). — R. Léandre: Densité en temps petit d'un processus de sauts. — ... etc. — Trente-sept exposés au total sont inclus dans ce volume.

Marston MORSE. — **Collected papers.** — Ed. by R. Bott. — Six volumes reliés, 17 × 25,5, de 3516 p. — Prix: £248.45. — Singapore, World Scientific (distributed in Europe by John Wiley & Sons, Chichester), 1987.

These volumes gather together all of Prof. Morse's 179 papers reprinted in chronological order. Recognized as one of the most original and prolific mathematicians of the century, Prof.

Morse has contributed to most branches of mathematics, especially to Variational analysis, Functional and Differential Geometry, and Dynamics. An interesting feature of his life and works is found in the first volume. Spanning a period of over 60 years of his remarkable mathematical career, these volumes serve as a valuable source-book of his works.

General inequalities 5. — 5th International Conference on General Inequalities, Oberwolfach, May 4-10, 1986. — Ed. by W. Walter. — International series of numerical mathematics, vol. 80. — Un vol. relié, 17 × 24, de XIX, 482 p. — Prix: Sfr. 95.00. — Birkhäuser Verlag, Basel, 1987.

The articles of this volume cover a wide range of subjects in the field of inequalities. The book begins with “the Bieberbach conjecture”, its history, and of greater importance, its proof. Problems from the classical range of inequalities are treated in the sections “Inequalities for sums”, “Series and integrals” and “Integrals and inequalities in analysis and approximation”. Various sections deal with recent developments, as well as applications, problems, etc.

N. V. KRYLOV. — **Nonlinear elliptic and parabolic equations of the second order.** — Mathematics and its applications (Soviet series). — Un vol. relié, 16,5 × 24,5, de XIII, 462 p. — Prix: Dfl. 245.00/US\$99.00. — D. Reidel Publishing Co., Dordrecht, 1987.

Nonlinear second-order elliptic and parabolic equations arise in the theory of differential equations and in numerous applications. Attempts to study consistently such equations in the past have been hampered by the lack of general techniques derived from a unifying standpoint. This volume presents a general theory for solving nonlinear second-order elliptic and parabolic equations which uses neither probabilistic nor geometrical notions.

Jens Carsten JANTZEN. — **Representations of algebraic groups.** — Pure and applied mathematics, vol. 131. — Un vol. relié, 15,5 × 23,5, de XIII, 443 p. — Prix: US\$59.50. — Academic Press, Inc., Orlando, FL., 1987.

Many different techniques have been introduced into the theory of algebraic groups, especially over the past 15 years. It is necessary, in the author's opinion, to start with a general introduction to the representation theory of algebraic group schemes. This is the aim of the first part of this book, whereas part 2 then deals with the representations of reductive groups.

Peter McCULLAGH. — **Tensor methods in statistics.** — Monographs on statistics and applied probability. — Un vol. relié, 14 × 22, de xv, 285 p. — Prix: £20.00. — Chapman & Hall, London, 1987.

This book provides a systematic development of tensor methods in statistics, beginning with the study of multivariate moments and cumulants. Subsequent chapters deal with asymptotic approximations based on Edgeworth expansion and saddlepoint expansion. The final chapters deal with likelihood ratio statistics, maximum likelihood estimation and the effect on inferences of conditioning on ancillary or approximately ancillary statistics.

R. P. BURN. — **Groups: a path to geometry.** — Un vol. broché, 15 × 23, de ix, 242 p. — Prix: £9.95/US\$16.95. — Cambridge University Press, Cambridge University Press, 1987.

Topics covered in this book are group theory, an introduction to vector spaces and to complex numbers, quaternions and their relationship to three-dimensional isometries and a study of crystallographic groups, with a complete analysis of these groups in two dimensions.

A. G. HAMILTON. — **A first course in linear algebra with concurrent examples.** — Un vol. broché, 15 × 23, de vi, 148 p. — Prix: £7.50/US\$12.95. — Cambridge University Press, Cambridge, 1987.

This is a short, readable introduction to basic linear algebra, as usually encountered in a first course. A large number of worked examples is provided on pages facing the text. Stress is placed on applications of the methods rather than developing a logical system of theorems.

D. C. CHAMPENEY. — **A handbook of Fourier theorems.** — Un vol. relié, 15,5 × 23,5, de ix, 185 p. — Prix: £25.00/US\$39.50. — Cambridge University Press, Cambridge, 1987.

This handbook comprises a collection of the most important theorems in Fourier analysis, presented without proof in a form that is accurate but also accessible to a reader who is not a specialist mathematician. Existing books on the subject are either rigorous treatments, intended for mathematicians, or are intended for non-mathematicians and avoid the finer points of the theory. This book bridges the gap between the two types.

P. GAENSSLER, W. STUTE. — **Seminar on empirical processes.** — DMW Seminar, Band 9. — Un vol. broché, 17 × 24, de 110 p. — Prix: Sfr. 32.00. — Birkhäuser, Basel, 1987.

The workshops organized by the Deutsche Mathematiker-Vereinigung are intended to help, in particular, students and younger mathematicians, to obtain an introduction to fields of current research. The authors organized the material in this book so as to give a fresh approach to empirical processes, thereby elaborating some of the main streams of the theory.

Masaaki YOSHIDA. — **Fuchsian differential equations, with special emphasis on the Gauss-Schwarz theory.** — Aspects of mathematics, vol. E11. — Un vol. broché, 16 × 23, de xiv, 214 p. — Prix: DM 48.00. — Friedr. Vieweg & Sohn, Braunschweig, 1987.

The aim of this book lies in the study of linear ordinary differential equations and systems of linear partial differential equations with finite dimensional solution spaces in the complex analytic category. The text concentrates exclusively on the Gauss-Schwarz theory of the hypergeometric differential equation under modern aspects and its higher dimensional generalization. It is presented here as part of the theory of orbifolds due to Satake and Thurston.

Erich HECKE. — **Analysis und Zahlentheorie: Vorlesung Hamburg 1920.** — Bearbeitet von Peter Roquette. — Dokumente zur Geschichte der Mathematik, Band 3. — Un vol. relié, 16,5 × 23, de xxv, 234 p. — Prix: DM 48.00. — Friedr. Vieweg & Sohn, Braunschweig, 1987.

Die in diesem Band abgedruckte Vorlesung über Analysis und Zahlentheorie wurde im Sommersemester 1920 von Erich Hecke an der Universität Hamburg gehalten. Das Erscheinen dieses Buches zum 100. Geburtstag Heckes würdigt einen Mathematiker, dessen Werk in letzter Zeit wieder ganz besonders aktuell geworden ist.

Eberhard GRIEPENTROG, Roswitha MAERZ. — **Differential-algebraic equations and their numerical treatment.** — Teubner-Texte zur Mathematik, Band 88. — Un vol. broché, 14,5 × 20,5, de 220 p. — Prix: DM 22.50. — B. G. Teubner, Leipzig, 1986.

This book is concerned with differential-algebraic equations in which the nullspace of the Jacobian depends only on t or is constant. This kind of system often arises in the modelling of processes in the natural sciences and technology.

Rivista di matematica pura ed applicata. — Editor-in-chief: Piergúlio Corsini. — Fascicules de 17×24 , le premier (No. 1) commençant en juillet 1987. — Publié à Udine (Italie).

In recent decades, the world of mathematics has witnessed, on the one hand, an explosion of new themes, and on the other hand, the development of already existing ones. But the latter are viewed in a new way, and are especially oriented towards unforeseen and sometimes strange applications, both in theoretical and experimental disciplines. We may cite as examples the non-classical binary algebraic systems (hypergroups, groupoids, quasigroups, semigroups), combinatorial geometry, stochastic processes, etc. At the present moment in Italy, there is not enough published material on these topics, and, for this reason, this magazine has been created which will give particular prominence to them.

Lev M. DUDKIN, Ilya RABINOVICH, Ilya VAKHUTINSKY. — **Iterative aggregation theory: mathematical methods of coordinating detailed and aggregate problems in large control systems.** — Pure and applied mathematics, vol. 111. — Un vol. broché, 16×24 , de XIV, 273 p. — Prix: US\$107.50. — Marcel Dekker, New York, 1987.

This work is the first comparative analysis available on iterative aggregation theory and covers general methods for solving extremum problems and systems of equations, decomposition methods, iterative aggregation algorithms for solving systems of interproduct input-output model equations, iterative aggregation algorithms for solving general linear systems... etc.

G. S. LADDE, V. LAKSHMIKANTHAM, B. G. ZHANG. — **Oscillation theory of differential equations with deviating arguments.** — Pure and applied mathematics, vol. 110. — Un vol. broché, 16×24 , de VI, 308 p. — Marcel Dekker, New York, 1987.

This is a systematic, up-to-date and the first English language treatment of oscillation and nonoscillation theory of differential equations with deviating arguments and of systems of these equations. *Contents:* First order linear equations. First order nonlinear equations. Second order differential equations. Higher order differential equations. Systems of differential equations.

Numerical integration: recent developments, software and applications. — Ed. by Patrick Keast, and Graeme Fairweather. — NATO ASI series C: Mathematical and Physical Sciences, vol. 203. — Un vol. relié, $16,5 \times 24,5$, de XIII, 394 p. — Prix: Dfl. 180.00. — D. Reidel, Dordrecht, 1987.

This volume contains referred papers and extended abstracts of papers presented at the NATO advanced research workshop held at Dalhousie University, Halifax in August 1986. The last workshop of this nature was held in 1975. Many developments having occurred in quadrature in the intervening years, it seemed an opportune time to bring together again researchers in the area.

David SHARPE. — **Rings and factorization.** — Un vol. relié, 14×22 , de IX, 111 p. — Prix: £17.50 (relié)/£7.50 (broché). — Cambridge University Press, Cambridge, 1987.

This is an introduction to the concept of factorization and its application to problems in algebra and number theory. Topics covered are the notions of rings, fields, prime elements and unique factorization. The author shows how these concepts can be applied to a variety of examples such as factorizing polynomials, finding determinants of matrices and Fermat's "two-squares theorem".

Yum-Tong SIU. — **Lectures on Hermitian-Einstein metrics for stable bundles and Kähler-Einstein metrics.** — DMV Seminar, Band 8. — Un vol. broché, 17 × 24, de 171 p. — Prix: Sfr. 40.00. — Birkhäuser Verlag, Basel, 1987.

These notes based on lectures delivered at the German Mathematical Society Seminar in June 1986 present to the reader the state-of-the-art results in the simplest and the most comprehensible form using the most natural approach. Prerequisites are kept to a minimum.

Vasile Ion ISTRATESCU. — **Inner product structures: theory and applications.** — Mathematics and its applications, vol. 25. — Un vol. relié, 17 × 24,5, de xv, 895 p. — Prix: Dfl. 360.00/US\$149.00. — D. Reidel Publishing Co., Dordrecht, 1987.

This book is primarily devoted to an exposition of the basic results on inner product structures. This subject matter is intimately linked to basic structures of linear operators and to the geometry of Banach spaces. The range of applications is broad. This volume deals with applications in probability theory and in physics.

O. I. AVEN, E. G. COFFMAN, Jr. and Y. A. KOGAN. — **Stochastic analysis of computer storage.** — Mathematics and its applications, vol. 38. — Un vol. relié, 16,5 × 24,5, de viii, 254 p. — Prix: Dfl. 185.00. — D. Reidel Publishing Co., Dordrecht, 1987.

Within the field of mathematical modeling and performance evaluation of computer systems, existing texts focus on applications of queueing theory to general computer design and scheduling problems, with minor emphasis on storage problems. Storage systems in computers continue to be a scarce resource and it is thus appropriate that this text should devote itself solely to the techniques for analyzing computer storage systems.

G. J. O. JAMESON. — **Summing and nuclear norms in Banach space theory.** — London Mathematical Society student texts, vol. 8. — Un vol. broché, 15 × 23, de xi, 172 p. — Prix: £7.50 (£22.50 relié). — Cambridge University Press, Cambridge, 1987.

This textbook is an introduction to the techniques of summing and nuclear norms, which in the last twenty years have proved to be extremely useful tools in the theory of Banach spaces. Concrete and largely non-technical proofs are given, and alternative proofs are often supplied, which contribute to the understanding of the text.

Intuitive geometry. — Ed. by K. Böröczky and G. Fejes Toth. — Colloquia mathematica societatis Janos Bolyai, vol. 48. — Un vol. relié, 17,5 × 24,5, de 708 p. — Prix: Dfl. 295.00. — North-Holland Publishing Co., Amsterdam, 1987.

Problems in discrete geometry, convexity and combinatorial geometry are examined in this volume. Some of the topics addressed include crystallography, classical differential geometry and rigidity theory. Other papers discuss the connections of geometry with biology, architecture, arts and even psychology.

KAZUO MUROTA. — **Systems analysis by graphs and matroids: structural solvability and controllability.** — Algorithms and combinatorics, vol. 3. — Un vol. broché, 16,5 × 24, de ix, 281 p. — Prix: DM 79.00. — Springer-Verlag, Berlin, 1987.

This monograph illustrates how engineering problems can be solved using the recent results of combinatorial mathematics through appropriate mathematical modeling. The structural solvability of a system of linear or nonlinear equations as well as the structural controllability of a linear time-invariant dynamical system are treated by means of graphs and matroids.

Serge LANG. — **Introduction to complex hyperbolic spaces.** — Un vol. relié, 16 × 24, de VIII, 271 p. — Prix: DM 118.00. — Springer-Verlag, 1987.

In this introduction to complex hyperbolic spaces, Lang discusses hyperbolic embeddings, Brody's theorem, negative curvature on line bundles, curvature on vector bundles, Nevanlinna theory, holomorphy curves, etc. Many of the results presented appear for the first time in book form.

E. BEHREND. — **Mass- und Integrationstheorie.** — Hochschultext. — Un vol. broché, 16 × 24, de XII, 260 p. — Prix: DM 39.50. — Springer-Verlag, Berlin, 1987.

Gute Kenntnisse in Mass- und Integrationstheorie sind unerlässlich für fast alle Bereiche der höheren Analysis, Wahrscheinlichkeitstheorie, Statistik und Physik. In dem vorliegenden Lehrbuch wird diese Theorie von den allerersten Anfängen systematisch bis zur Theorie der Radonmasse entwickelt.

Combinatorial geometries. — Ed. by Neil White. — Encyclopedia of mathematics and its applications. — Un vol. relié, 16,5 × 24,5, de XII, 212 p. — Prix: £25.00. — Cambridge University Press, Cambridge, 1987.

This book is a continuation of "Theory of matroids" and consists of a series of related surveys that have been contributed by authorities in the area. Topics discussed are: coordinatizations, matching theory, transversal and simplicial matroids, studies of the important matroid invariants, matroids in combinatorial optimization.

Lars GÄRDING. — **Singularities in linear wave propagation.** — Lecture notes in mathematics, vol. 1241. — Un vol. broché, 16,5 × 24, de III, 125 p. — Prix: DM 23.00. — Springer-Verlag, Berlin, 1987.

These notes were given at the Nankin Institute for Mathematics, Tianjin, in 1986 and center on the construction of parametrices for fundamental solutions of hyperbolic differential and pseudodifferential operators.

Stephen RALLIS. — **L-functions and the oscillator representation.** — Lecture notes in mathematics, vol. 1245. — Un vol. broché, 16,5 × 24, de xv, 239 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1987.

Special Eisenstein series on orthogonal groups. — Siegel formula revisited. — Inner product formulae. — Siegel formula, compact case. — Local L-factors. — Global theory.

Felipe Cano TORRES. — **Desingularization strategies for three-dimensional vector fields.** — Lecture notes in mathematics, vol. 1259. — Un vol. broché, 16,5 × 24, de ix, 189 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

In this research monograph, several strategies are given to make the algebraic multiplicity of a three-dimensional vector field decrease, by means of permissible blowing-ups of the ambient space.

Nicolae H. PAVEL. — **Nonlinear evolution operators and semi-groups; applications to partial differential equations.** — Lecture notes in mathematics, vol. 1260. — Un vol. broché, 16,5 × 24, de vi, 285 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1987.

This work deals with nonlinear evolution operators and semigroups generated by dissipative (accretive), possibly multivalued operators, as well as with the application of this theory to partial differential equations. It shows that a large class of PDE's can be studied via the semigroup approach.

Herbert ABELS. — **Finite presentability of S-arithmetic groups.** Compact presentability of solvable groups. — Lecture notes in mathematics, vol. 1261. — Un vol. broché, 16,5 × 24, de vi, 178 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

Compact presentability and contracting automorphisms. — Filtrations of Lie algebras and groups. — A necessary condition for compact presentability. — Implications of the necessary condition. — The second homology. — S-arithmetic groups. — S-arithmetic solvable groups.

Zahlentheoretische Analysis II: Wiener Seminarberichte 1984-86. — Hrsg.: E. Hlawka. — Lecture notes in mathematics, vol. 1262. — Un vol. broché, 16,5 × 24, de v, 158 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1987.

The application of methods from analytic number theory to different fields of analysis and applied mathematics was the subject of a regular seminar of the Technical University of Vienna in 1984-86. A selection of the lectures given are presented in this volume.

Differential geometry. — Proceedings of the Nordic Summer School held in Lyngby, Denmark, Jul. 29-Aug. 9, 1985. — Ed.: V. L. Hansen. — Lecture notes in mathematics, vol. 1263. — Un vol. broché, 16,5 × 24, de xi, 288 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1987.

Papers presented cover twistor methods for harmonic maps, the differential geometric aspects of Yang-Mills theory, complex differential geometry, metric differential geometry and partial differential equations in differential geometry.
