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D. REVUZ. — **Markov chains.** — Revised edition. — North-Holland mathematical library, vol. 11. — Un vol. relié, 16×23 , de xii, 374 p. — Prix: Dfl. 150.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

This is the revised and augmented edition of this now classical book which provides an introduction to sub-Markovian kernels on general measurable spaces and their associated homogeneous Markov chains. The first part of the book, an expository text on the foundations of the subject, is intended for post-graduate students. A study of potential theory, the basic classification of chains according to their asymptotic behaviour and the celebrated Chacon-Ornstein theorem are examined in detail. The second part of the book is at a more advanced level and includes a treatment of random walks on general locally compact abelian groups. Further chapters go on to develop renewal theory, an introduction to Martin boundary and the study of chains recurrent in the Harris sense. Finally, the last chapter deals with the construction of chains starting from a kernel satisfying some kind of maximum principle. The number of exercises has been increased and some of them have been rewritten so as to provide more hints.

Pierre MAZET. — **Analytic sets in locally convex spaces.** — North-Holland mathematics studies, vol. 89. — Notas de matematica, vol. 93. — Un vol. broché, $16,5 \times 24$, de x, 276 p. — Prix: Dfl. 100.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

This book gives definitions and basic tools for analytic geometry in the infinite dimensional case. It is divided into three main parts. The first part generalizes several techniques of commutative algebra to non-Noetherian situations, which are met in the study of infinite dimensional spaces. The second part, which is the most important, is dedicated to the geometrical study of analytic spaces. In this section the theorems on the local representation of analytic spaces are generalized together with the great classical theorems videlicet the Nullstellensatz, the direct image theorem and the theorem of Remmert-Stein. In the final section there are three appendices which cover other aspects of this work and several open problems. — *Contents:* *The generalization of Noetherian methods:* The notion of grade. N -Noetherian rings. Cohen-Macaulay rings. — *Analytic sets:* Analytic maps. Analytic spaces. Analytic functionals. Analytic subsets. Ramified covers. Analytic subsets of finite definition. Analytic spaces of finite dimension. — *The appendices:* Remarks on the local algebraic properties of $\mathcal{C}(E)$. The coherence of the rings $\mathcal{C}(E)$. Extension problems.

Functional analysis: surveys and recent results III. — Proceedings of the conference on functional analysis, Paderborn, Germany, 24-29 May, 1983. — Edited by Klaus-Dieter Bierstedt and Benno Fuchssteiner. — North-Holland mathematics studies,

vol. 90. — Notas de matematica, vol. 94. — Un vol. broché, $16,5 \times 24$, de xiv, 382 p. — Prix: Dfl. 140.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

P. Wojtaszczyk: The Banach space H_1 . — *C. Stegall*: Gateaux differentiation of functions on a certain class of Banach spaces. — *C. Schütt*: Banach spaces of operators and local unconditional structure. — *W. Ruess*: Duality and geometry of spaces of compact operators. — *H. Jarchow*: On certain locally convex topologies on Banach spaces. — *L. W. Weis*: Decompositions of positive operators and some of their applications. — *H. P. Lotz*: Tauberian theorems for operators on L^∞ and similar spaces. — *H. H. Schaefer*: Positive bilinear forms and the Radon-Nikodym theorem. — *R. Nagel*: What can positivity do for stability? — *K. Donner*: Extensions of positive operators. — *G. Wittstock*: On matrix order and convexity. — *D. Petz*: Ergodic theorems in von Neumann algebras. — *H. G. Dales*: Automatic continuity of homomorphisms from C^* -algebras. — *K. B. Laursen*: Epimorphisms of C^* -algebras. — *B. Kramm*: Nuclearity and function algebras: a survey. — *H. Goldmann, B. Kramm and D. Vogt*: Reflexive function algebras. — *L. A. Moraes*: The Hahn-Banach extension theorem for some spaces of n -homogeneous polynomials. — *R. Mennicken and M. Möller*: A generalization of a theorem of Keldys. — *E. G. F. Thomas*: The theorem of Bochner-Schwartz-Godement for generalized Gelfand pairs. — *P. Dierolf*: Multiplication and convolution operators between spaces of distributions. — *R. Meise*: Structure of closed linear translation invariant subspaces of $A(C)$ and kernels of convolution operators. — *D. Vogt*: Some results on continuous linear maps between Fréchet spaces.

Steven B. ENGELSMAN. — **Families of curves and the origins of partial differentiation.** — North-Holland mathematics studies, vol. 93. — Un vol. broché, $16,5 \times 24$, de x, 238 p. — Prix: Dfl. 85.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

This book provides a detailed description of the main episodes in the emergence of partial differentiation during the period 1690-1740. It argues that the development of this concept — to a considerable degree of perfection — took place almost exclusively in problems concerning families of curves. Thus, the book shows the origins of the ideas and techniques which pathed the way for the sudden introduction of partial differential equations in 1750. The main methodological characteristic of the book is its emphasis on a full understanding of the motives, problems and goals of the mathematicians of that time. This book contains editions and translations of two hitherto unpublished texts by Euler and Nicolaus I. Bernoulli on partial differentiation. — *Contents*: Introduction. — Families of curves in the 1690s. — Orthogonal trajectories 1694-1720. — Nicolaus I. Bernoulli and orthogonal trajectories. — Euler's theory of modular equations in the 1730's. — Appendices.

Kenneth KUNEN. — **Set theory: an introduction to independence proofs.** — Studies in logic and the foundations of mathematics, vol. 102. — Un vol. broché, $15 \times 22,5$, de xiv, 314 p. — Prix: Dfl. 75.00. — North-Holland, Amsterdam/New York/Oxford, 1980, 1st reprint 1983 as a paperback edition.

Many branches of abstract mathematics have been affected by the modern independence proofs in set theory. This book provides an introduction to relative consistency proofs in axiomatic set theory, and is intended to be used as a text in beginning graduate courses in that subject. It is hoped that this treatment will make the subject accessible to those mathematicians whose research is sensitive to axiomatics. The readers should have had the equivalent of an undergraduate course on cardinals and ordinals, but no specific training in logic is necessary.

Logic colloquium '82. — Proceedings of the colloquium held in Florence, 23-28 August, 1982. — Edited by G. Lolli, G. Longo, and A. Marcja. — Studies in logic and the foundations of mathematics, vol. 112. — Un vol. relié, 16 × 23, de viii, 358 p. — Prix: Dfl. 135.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

C. Smorynski: Lectures on nonstandard models of arithmetic (commemorating Giuseppe Peano). — J. T. Baldwin: Strong saturation and the foundations of stability theory. — G. L. Cherlin: Undecidability of rational function fields in nonzero characteristic. — L. van den Dries: Remarks on Tarski's problem concerning $(R, +, \dots, \exp)$. — D. Lascar: Sous-groupes d'automorphismes d'une structure saturée. — R. Magari: Algebraic logic and diagonal phenomena. — S. Shelah: On logical sentences in PA . — M. P. Fourman: Continuous truth I (non-constructive objects). — R. J. Grayson: Heyting-valued semantics. — H. Barendregt: Lambda calculus and its models. — M. Coppo, M. Dezani-Ciancaglini, F. Honsell, and G. Longo: Extended type structures and filter lambda models. — E. Börger: Decision problems in predicate logic. — J. A. Makowsky: Model theoretic issues in theoretical computer science, part I: relational data bases and abstract data types. — D. Mundici: NP and Craig's interpolation theorem.

Classical and quantum models and arithmetic problems. — Ed. by David V. Chudnovsky and Gregory V. Chudnovsky. — Lecture notes in pure and applied mathematics, vol. 92. — Un vol. broché, 18 × 25, de xi, 461 p. — Marcel Dekker, Inc., New York and Basel, 1984.

M. F. Barnsley, J. S. Geronimo, and A. N. Harrington: Geometrical and electrical properties of some Julia sets. — Harvey Cohn: Mathematical microcosm of geodesics, free groups, and Markoff forms. — David Chudnovsky and Gregory V. Chudnovsky: Note on Eisenstein's system of differential equations: an example of "Exactly solvable but not completely integrable system of differential equations". — David V. Chudnovsky and Gregory V. Chudnovsky: Some remarks on theta functions and s-matrices. — David V. Chudnovsky and Gregory V. Chudnovsky: Recurrences, Padé approximations and their applications. — Richard C. Churchill and David Lee: Harmonic oscillators at low energies. — Martin C. Gutzwiller: The quantization of a classically ergodic system. — Asmus L. Schmidt: Diophantine approximation of complex numbers. — Mark Sheingorn: Trajectories on Reimann surfaces. — Michael Tabor: On the analytic structure of dynamical systems: Painlevé revisited. — Appendix I: David V. Chudnovsky and Gregory V. Chudnovsky: Travaux de J. Drach (1919). — Appendix II: M. Jules Drach: Sur l'intégration par quadratures de l'équation $d^2y/dx^2 = [\phi(x)+h]y$. — Appendix III: P. B. Naiman: On the theory of periodic and limit-periodic Jacobian matrices.

P. E. KOPP. — **Martingales and stochastic integrals.** — Un vol. relié, 15,5 × 23,5, de xi, 202 p. — Prix: £17.50. — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

This book provides an introduction to the rapidly expanding theory of stochastic integration and martingales. The treatment is close to that developed by the French school of probabilists, but more elementary than other texts. The presentation is abstract, but largely self-contained (including proofs of the "section theorems") and Dr. Kopp makes fewer demands on the reader's background in probability theory than is usual. He gives a fairly full discussion of the measure theory and functional analysis needed for martingale theory, and describes the role of Brownian motion and the Poisson process as paradigm examples in the construction of abstract

stochastic integrals. *Contents*: Probabilistic background. — Weak compactness and uniform integrability. — Discrete time martingales. — Continuous-time martingales. — Stochastic integrals. — *Appendix*: A non-commutative extension of stochastic integration (by C. Barnett and I. F. Wilde).

Nonlinear partial differential equations in applied science. — Proceedings of the U.S.-Japan seminar, Tokyo, 1982. — Edited by Hiroshi Fujita, Peter D. Lax, Gilbert Strang. — North-Holland mathematics studies, vol. 81. — Lecture notes in numerical and applied analysis, vol. 5. — Un vol. broché, $16,5 \times 24$, de xviii, 457 p. — Prix: Dfl. 180.00. — North-Holland publishing company, Amsterdam/New York/Oxford, and Kinokuniya company Ltd., Tokyo, 1983.

This volume contains 26 papers presented at this joint seminar. Nonlinear PDEs have been attracting an expanding research interest in various fields of applied science. This book provides a review of the state-of-the-art of mathematical research of nonlinear PDEs in the U.S. and Japan, and an excellent survey and new results on various nonlinear phenomena, including flow problems (conservation law, Boltzmann equation, Navier-Stokes equations, etc.), free-boundary problems (asymptotic behaviors, Nash's theorem, numerical aspects, etc.), chaos and bifurcation problems, nonlinear Schroedinger equations, soliton and Grassmann manifolds, plasticity problems, inverse problems, and more.

Galois groups and their representations. — Proceedings of a symposium held in Nagoya, from December 14, 1981 until December 18, 1981. — Edited by Y. Ihara. — Advanced studies in pure mathematics, vol. 2. — Un vol. relié, 16×24 , de x, 172 p. — Prix: Dfl. 100.00. — North-Holland publishing company, Amsterdam/New York/Oxford, and Kinokuniya company Ltd., Tokyo, 1983.

Tomio Kubota: Notes on metaplectic automorphic functions and zeta functions. — *Takayuki Oda*: Hodge structures of Shimura varieties attached to the unit groups of quaternion algebras. — *Masami Ohta*: On the zeta function of an abelian scheme over the Shimura curve II. — *Hiroo Miki*: On the absolute Galois groups of local fields I. — *Keiichi Komatsu*: On the absolute Galois groups of local fields II. — *Shoichi Nakajima*: On generalized Hasse-Witt invariants of an algebraic curve. — *Yasutaka Ihara*: On unramified extensions of function fields over finite fields. — *Kôji Uchida*: Galois groups of unramified solvable extensions. — *Kazuya Kato and Shuji Saito*: Two dimensional class field theory. — *Kazuya Kato*: Residue homomorphisms in Milnor K-theory.

H. S. M. COXETER, W. O. J. MOSER. — **Generators and relations for discrete groups.** — Reprint of the 4th edition. — *Ergebnisse der Mathematik und ihrer Grenzgebiete*, Bd. 14. — Un vol. relié, 17×25 , de ix, 169 p. — Prix: DM 74.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Cyclic, dicyclic and metacyclic groups. — Systematic enumeration of cosets. — Graphs, maps and Cayley diagrams. — Abstract crystallography. — Hyperbolic tessellations and fundamental groups. — The symmetric, alternating, and other special groups. — Modular and linear fractional groups. — Regular maps. — Groups generated by reflections. — Tables. — This 4th edition incorporates a revised, clearer version of the process of coset enumeration as well as innovations and corrections.

N. J. KALTON, N. T. PECK, James W. ROBERTS. — **An F-space sampler.** — London mathematical society lecture note series, vol. 89. — Un vol. broché, $15 \times 22,5$,

de XII, 240 p. — Prix: £15.00. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

This book presents a theory motivated by the spaces L_p , $0 \leq p < 1$. These spaces are not locally convex, so the methods usually encountered in linear analysis (particularly the Hahn-Banach theorem) do not apply here. Questions about the size of the dual space are especially important in the nonlocally convex setting, and are a central theme. Several of the classical problems in the area have been settled in the last decade, and a number of their solutions are presented here. The book begins with concrete examples before going on to general results and important counter-examples.

L. EGGHE. — **Stopping time techniques for analysts and probabilists.** — London mathematical society lecture note series, vol. 100. — Un vol. broché, $15 \times 22,5$, de XVI, 351 p. — £17.50. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

This book considers convergence of adapted sequences of real and Banach space-valued integrable functions, emphasizing the use of stopping time techniques. Not only are highly specialized results given, but also elementary applications of these results. The book starts by discussing the convergence theory of martingales and sub- (or super-) martingales with values in a Banach space with or without the Radon-Nikodym property. Several inequalities which are of use in the study of the convergence of more general adapted sequence such as (uniform) amarts, mils and pramarts are proved and sub- and superpramarts are discussed and applied to the convergence of pramarts. Most of the results have a strong relationship with (or in fact are characterizations of) topological or geometrical properties of Banach spaces.

T. S. BLYTH and E. F. ROBERTSON. — **Algebra through practice: a collection of problems in algebra with solutions:** Book 1: sets, relations and mappings, Book 2: matrices and vector spaces, Book 3: groups, rings and fields. — 3 vol. brochés, 15×21 , de respectivement, x, 97 p., x, 99 p., x, 95 p. — Prix: £3.50 chaque volume. — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

Problem solving is an art that is central to understanding and ability in mathematics. With this series of books the authors have provided a selection of problems with complete solutions and test papers designed to be used with or instead of standard textbooks on algebra. For the convenience of the reader, a key explaining how the present books may be used in conjunction with some of the major textbooks is included. Each book of problems is divided into chapters that begin with some notes on notation and prerequisites. The majority of the material is aimed at the student of average ability but there are some more challenging problems. By working through the books, the student will gain a deeper understanding of the fundamental concepts involved, and practice in the formulation, and so solution, of other algebraic problems. Later books in the series cover material at a more advanced level than the earlier titles, although each is, within its own limits, self-contained.

F. LIRET, M. ZISMAN, et S. GOODENOUGH. — **Maths: tome 2.** — Collection «Dunod Université». — Un vol. broché, $15,5 \times 24$, de VIII, 360 p. — Prix: FF 98.00. — Dunod, Paris, 1984.

Avec la parution du tome 2 au seuil de la rentrée universitaire 84/85, se trouve ainsi complété le cours de Maths de François Liret et Michel Zisman.

Ces deux auteurs proposent aux étudiants en sciences de première année un manuel élémentaire de mathématiques particulièrement original par sa démarche. Il ne s'agit pas d'un cours abstrait qui ne fait qu'exposer les mathématiques figurant au programme. Celui-ci prend les étudiants par la main et très progressivement les amène à acquérir de solides connaissances en algèbre et en analyse. Ce livre est une sorte de dialogue entre les auteurs et les étudiants par l'intermédiaire d'exercices, de tests, de rappels et de révisions éparpillés dans le texte. Chacun des deux tomes fourmille de conseils, mises en garde, encouragements. Exercices à résoudre, formules à recopier, calculs à effectuer ponctuent ce cours qui a l'ambition de proposer une « méthode pour apprendre » permettant d'acquérir un savoir-faire autant qu'un savoir.

Christoph J. SCRIBA. — **Zur Geschichte der Bestimmung rationaler Punkte auf elliptischen Kurven: das Problem von Beha-Eddin 'Amuli.** — Berichte aus den Sitzungen der Joachim Jungius-Gesellschaft der Wissenschaften E.V., Hamburg, Jahrgang I, 1982/83, Heft 6. — Un vol. broché, $15 \times 22,5$, de 52 p. — Prix: DM 9.80. — Joachim Jungius-Gesellschaft der Wissenschaften, Hamburg, in Kommission beim Verlag Vandenhoeck und Ruprecht, Göttingen, 1984.

Einleitung. — Das Beispiel Beha-Eddins und die mathematische Problemstellung. — Von Diophant bis Jacobi. — Beha-Eddins Problem im 19. Jahrhundert. — Von Poincaré bis zur Gegenwart. — Rückblick und Ausblick.

Yasuo OKUYAMA. — **Absolute summability of Fourier series and orthogonal series.** — Lecture notes in mathematics, vol. 1067. — Un vol. broché, $16,5 \times 24$, de vi, 118 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Absolute convergence of orthogonal series. — Absolute Nörlund summability almost everywhere of Fourier and orthogonal series. — Absolute Riesz summability almost everywhere of orthogonal series. — Absolute Nörlund summability factors of Fourier series. — Absolute Nörlund summability factors of conjugate series of Fourier series. — Local property of absolute Riesz summability of Fourier series. — Local property of absolute Nörlund summability of Fourier series.

Number theory, Noordwijkerhout, 1983. — Proceedings of the Journées arithmétiques held at Noordwijkerhout, The Netherlands, July 11-15, 1983. — Edited by H. Jager. — Lecture notes in mathematics, vol. 1068. — Un vol. broché, $16,5 \times 24$, de v, 296 p. — Prix: DM 45.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

In 1961, French number theorists gathered during a weekend in Grenoble where six lectures on the subject were delivered. This proved a success and subsequent Journées arithmétiques were held in various French towns as well as in Exeter. In 1983, the 13th meeting of the series was hosted by the Netherlands. It took place at the conference centre "de Leeuwenhorst" near Leiden, with participants from 13 countries coming to attend 80 lectures which related to almost all aspects of number theory. There is something for every number theorist in this volume, ranging from algebraic number theory, Riemann's zeta function and prime numbers, to transcendental number theory and uniform distribution.

Matthias KRECK. — **Bordism of diffeomorphisms and related topics.** — With an appendix by Neal W. Stoltzfus. — Lecture notes in mathematics, vol. 1069. —

Un vol. broché, $16,5 \times 24$, de III, 144 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Bordism groups of orientation preserving diffeomorphisms. — Report about equivariant Witt groups. — The isometric structure of a diffeomorphism. — The mapping torus of a diffeomorphism. — Fibrations over S^1 within their bordism class and the computation of Δ_* . — Addition and subtraction of handles. — Proof of theorem in the odd-dimensional case and in the even-dimensional case. — Bordism of diffeomorphisms on manifolds with additional normal structures like Spin-, unitary structures or framings; orientation reversing diffeomorphisms and the unoriented case. — Applications to SK-groups. — Miscellaneous results: ring structure, generators, relation to the inertia group. — Appendix by Neal W. Stoltzfus: The algebraic relationship between Quinn's invariant for open book decomposition bordism and the isometric structure.

Interpolation spaces and allied topics in analysis. — Proceedings of the conference held in Lund, Sweden, August 29-September 1, 1983. — Edited by M. Cwikel and J. Peetre. — Lecture notes in mathematics, vol. 1070. — Un vol. broché, $16,5 \times 24$, de III, 239 p. — Prix: DM 31.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Most of the papers of these proceedings are research reports; not all are directly concerned with interpolation, but rather illustrate its interplay with related areas. There is also a problem section, as well as a brief historical introduction destined for the non-specialists. The volume also includes the first printed English version of P. Mityagin's famous 1965 paper, "An interpolation theorem for modular spaces." — *From the contents:* J. Arazy, S. Fisher: Some aspects of the minimal, Möbius-invariant space of analytic functions on the unit disc. — M. Cwikel, P. Nilsson: The coincidence of real and complex interpolation methods for couples of weighted Banach lattices. — S. Janson, J. Peetre: Higher order commutators of singular integral operators. — H. N. Mhaskar: On the smoothness of Fourier transforms.

Franz ROTHE. — **Global solutions of reaction-diffusion systems.** — Lecture notes in mathematics, vol. 1072. — Un vol. broché, $16,5 \times 24$, de V, 216 p. — Prix: DM 31.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This research monograph grew out of several examples taken from mathematical biology. Since nonlinear PDE's can be formulated in many functional analytic settings, it is a nontrivial problem to find the appropriate one. For reaction-diffusion systems it turns out to be even more advantageous to use several different settings simultaneously. Going through a sequence of L_p -spaces, one obtains improving a priori estimates, ending up with estimates which exclude blow-up in finite time and thus guarantees the existence of globally bounded solutions. The 1st part of the monograph systematically carries out this "bootstrapping" for scalar equations. The 2nd part returns to systems and proves existence of globally bounded solutions for six motivating examples. In some cases the asymptotic behavior is determined in detail.

Graph theory, Singapore 1983. — Proceedings of the 1st Southeast Asian graph theory colloquium, held in Singapore, May 10-28, 1983. — Edited by K. M. Koh and H. P. Yap. — Lecture notes in mathematics, vol. 1073. — Un vol. broché, $16,5 \times 24$, de XIII, 335 p. — Prix: DM 45.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This colloquium brought together 60 mathematicians from 13 countries. The resulting proceedings reflect the scope of the colloquium and include a survey paper by E. C. Milner "Lectures on the marriage theorem of Aharoni, Nash-Williams and Shelah", an expository paper by F. Harary, "General connectivity", and a list of open problems posed by the participants. — *From the contents*: C. Berge: On the minimum number of arcs to reverse to make a graph strongly connected. — C. C. Chen, D. A. Holton: Cycles in abelian Cayley graphs with a proscribed vertex. — M. Kano: Graph factors with given properties. — H. P. Yap: Computational complexity of graph properties.

Edward W. STREDULINSKY. — **Weighted inequalities and degenerate elliptic partial differential equations.** — Lecture notes in mathematics, vol. 1074. — Un vol. broché, 16,5 × 24, de III, 143 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Preliminary analysis: Calculus in measure spaces. Weighted Hardy inequalities. Equivalence of capacities. — *Basic results*: Weighted Sobolev inequalities. Properties of Sobolev spaces, capacities and Sobolev inequalities for applications to differential equations. Higher integrability from reverse Hölder inequalities. — *Applications*: A Harnack inequality and continuity of weak solutions for degenerate elliptic equations. Modulus of continuity estimates for weighted Sobolev functions and V.M.O. functions. Higher integrability for the gradient of solutions of elliptic systems and applications to continuity of solutions.

Hideyuki MAJIMA. — **Asymptotic analysis for integrable connections with irregular singular points.** — Lecture notes in mathematics, vol. 1075. — Un vol. broché, 16,5 × 24, de IX, 159 p. — Prix: DM 26.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

General introduction. — Asymptotic developability and vanishing theorems in asymptotic analysis. — Existence theorems of asymptotic solutions to systems of partial differential equations of the first order and splitting lemmas. — Stokes phenomena and Riemann-Hilbert-Birkhoff problem for integrable connections with irregular singular points. — The ∇ -Poincaré lemma and ∇ -de Rham cohomology theorem for integrable connections with irregular singular points.

Infinite-dimensional systems. — Proceedings of the conference on operator semi-groups and applications held in Retzhof (Styria), Austria, June 5-11, 1983. — Edited by F. Kappel and W. Schappacher. — Lecture notes in mathematics, vol. 1076. — Un vol. broché, 16,5 × 24, de VII, 278 p. — Prix: DM 38.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

The aim of this meeting was to stimulate an intensive exchange of ideas between world experts (42 scientists coming from 12 countries) in the area of operator semigroup theory and to provide information on recent advances in various directions of research as for instance, integral- and integrodifferential equations, age dependent population dynamics, approximation methods. Particular emphasis is laid on applications to concrete problems in physics and biology.

Hugh APSIMON. — **Mathematical byways in Ayling, Beeling, and Ceiling.** — Recreations in mathematics (a new series intended to cover all aspects of this diverse,

ancient, and popular subject). — Un vol. relié, $14 \times 22,5$, de xii, 97 p. — Prix: £5.95. — Oxford university press, Oxford/New York/Toronto, 1984.

"Mathematical byways" is a book of freshness and originality. Hugh ApSimon has collected and composed problems for over thirty years. In this book he develops the pick of his collection in terms of the relationship between three unusual English villages, Ayling, Beeling, and Ceiling, and the interactions of their idiosyncratic inhabitants. Each problem can be solved without highpowered mathematics, but most require care and ingenuity. Most of them lead on to variations and extensions, unsolved here, left as challenges to the reader.

A. F. BEARDON. — **A primer on Riemann surfaces.** — London mathematical society lecture note series, vol. 78. — Un vol. broché, $15,5 \times 22,5$, de x, 188 p. — Prix: £12.95. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

In this short introduction to the theory of Riemann surfaces the author stresses the basic geometric ideas to give a simple but rigorous account of the subject. He has tried to bridge the gap between the common pictorial, but heuristic, treatments and the more formidable and sophisticated works. By restricting the content, he has been able to write a text suitable for a follow-up course for advanced undergraduates, or beginning graduates who are already familiar with basic complex analysis. It will also be useful for non-mathematicians who require a simple introduction to the subject. — Contents: Analysis in the plane. — Topology. — Riemann surfaces. — Analytic functions. — The disc the plane and the extended plane. — Compact surfaces. — Covering spaces. — Subharmonic functions. — The major results.

Esa NUMMELIN. — **General irreducible Markov chains and non-negative operators.** — Cambridge tracts in mathematics, vol. 83. — Un vol. relié, $16 \times 23,5$, de xi, 156 p. — Prix: £20.00. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

The purpose of this book is to present the theory of general irreducible Markov chains and to point out the connection between this and the Perron-Frobenius theory of non-negative operators. The author begins by providing some basic material essential to make the book reasonably self-contained, yet his aim throughout is to emphasize recent developments. In particular, the technique of embedded renewal processes, common in the study of discrete Markov chains, plays an important role. The examples discussed indicate applications to such topics as queueing theory, storage theory, autoregressive processes and renewal theory. Consequently, the book will be useful to researchers in the theory and applications of Markov chains, but it can also be used as a graduate-level textbook for courses on Markov chains or aspects of operator theory. — Contents: Preliminaries. — Irreducible kernels. — Transience and recurrence. — Embedded renewal processes. — Positive and null recurrence. — Total variation limit theorems. — Miscellaneous limit theorems for Harris recurrent Markov chains.

D. H. FREMLIN. — **Consequences of Martin's axiom.** — Cambridge tracts in mathematics, vol. 84. — Un vol. relié, $16 \times 23,5$, de xii, 325 p. — Prix: £27.50. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

Martin's axiom is one of the most fruitful of the new axioms which have been devised to show that certain properties are insoluble in standard set theory. It has

important applications in set theory, infinitary combinatorics, general topology, measure theory, functional analysis and group theory. In this, the first book devoted to Martin's axiom, the author has sought to collect together as many of these applications as possible into one rational scheme, with proofs of the principal results. His aim is to show how straightforward and beautiful arguments can be used to derive a great many consistency results from the consistency of Martin's axiom. This book should be accessible to anyone researching in the subjects to which Martin's axiom is relevant, for the author does not require of the reader any knowledge of mathematical logic, and has provided, in an appendix, brief introductions to the major topics discussed.

Kiyosi ITÔ. — **Introduction to probability theory.** — Un vol. broché, 15×23 , de x, 213 p. — Prix: £6.95 (relié: £18.50). — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

Professor Itô is one of the most distinguished probability theorists in the world, and in this modern, concise introduction to the subject he explains basic probabilistic concepts rigorously and yet gives at the same time an intuitive understanding of random phenomena. In the first chapter he considers finite situations, but from an advanced standpoint that enables the transition to greater generality to be achieved the more easily. Chapter 2 deals with probability measures and includes a discussion of the fundamental concepts of probability theory. These concepts are formulated abstractly but without sacrificing intuition. The last chapter is devoted to infinite sums of independent real random variables. Each chapter is divided into sections that end with a set of problems with hints for solution.

Padé approximation and its applications, Bad Honnef 1983. — Proceedings of a conference held at Bad Honnef, Germany, March 7-10, 1983. — Edited by H. Werner and H. J. Bünger. — Lecture notes in mathematics, vol. 1071. — Un vol. relié, $16,5 \times 24$, de vi, 264 p. — Prix: DM 38.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

From the preface: "In this volume the following trends become transparent. There is the development of the more algebraic theory of Padé approximation and sequence transformations. Using tools from real and complex analysis much effort is devoted to accelerating the convergence of continued fractions or at least to the error estimation of rational approximation and interpolation. The algorithmic side of rational interpolation is now generalized to the multivariate case. As a special result we mention how a (by now classical) rational interpolation technique can be stabilized against accidental occurrence of a vanishing denominator. It is also apparent from the proceedings that a number of papers were devoted to applications of the methods previously mentioned."

Lie group representations III. — Proceedings of the special year held at the University of Maryland, College Park 1982-1983. Edited by R. Herb, R. Johnson, R. Lipsman and J. Rosenberg. — Lecture notes in mathematics, vol. 1077. — Un vol. broché, $16,5 \times 24$, de xi, 454 p. — Prix: DM 64.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

L. Corwin: Matrix coefficients of nilpotent Lie groups. Primary projections on manifolds. Solvability of left invariant differential operators on nilpotent Lie groups. — *M. Cowling, A. Koranyi:* Harmonic analysis on Heisenberg type groups from a

geometric viewpoint. — *M. Duflo*: On the Plancherel formula for almost algebraic real Lie groups. — *M. Flensted-Jensen*: Harmonic analysis on semi-simple symmetric spaces. A method of duality. — *B. Helffer*: Partial differential equations on nilpotent groups. — *S. Helgason*: Wave equations on homogeneous spaces. — *R. Howe, G. Ratcliff, N. Wildberger*: Symbol mappings for certain nilpotent groups. — *H. Moscovici*: Lefschetz formulae for Hecke operators. — *Richard Penney*: Harmonic analysis on unbounded homogeneous domains in C^n . — *W. Rossmann*: Characters as contour integrals. — *L. P. Rothschild*: Analyticity of solutions of partial differential equations on nilpotent Lie groups. — *V. S. Varadarajan*: Asymptotic properties of eigenvalues and eigenfunctions of invariant differential operators on symmetric and locally symmetric spaces. — *G. J. Zuckerman*: Quantum physics and semisimple symmetric spaces.

A. J. E. M. JANSSEN, P. van DER STEEN. — **Integration theory.** — Lecture notes in mathematics, vol. 1078. — Un vol. broché, $16,5 \times 24$, de v, 224 p. — Prix: DM 31.50. — Springer-Verlag, Berlin Heidelberg/New York/Tokyo, 1984.

This book gives an introduction to integration theory for mathematics students at the senior or first year graduate level. It presents the theory in such a way that the more common approaches to integration theory appear as elaborations of a general scheme. The methods of Carathéodory, Bourbaki, and Daniell are treated in full detail, while several others are sketched in the exercises. Further topics include the Riesz representation theorem, Baire and Borel functions, the Radon-Nikodym theorem, L_p -spaces, and Fourier theory.

Wolfgang RUPPERT. — **Compact semitopological semigroups: an intrinsic theory.** — Lecture notes in mathematics, vol. 1079. — Un vol. broché, $16,5 \times 24$, de v, 260 p. — Prix: DM 38.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This monographs develops a theory under a strictly "structural" point of view, with the purpose of elucidating the algebraic and topological structure of the semigroups considered, using mainly techniques from topological algebra rather than from functional analysis. Apart from elementary algebraic techniques, the tools used in this approach are mostly joint continuity theorems, transformation group theory, and Lie theory. With their help it is possible not only to devise fresh proofs of classical results (which traditionally depended on results and methods borrowed from functional analysis) but also to gain a considerable body of new structural information, which in turn should be of interest also to specialists in harmonic analysis and related subjects.

Probability theory on vector spaces III. — Proceedings of a conference held in Lublin, Poland, August 24-31, 1983. — Edited by D. Szynal and A. Weron. — Lecture notes in mathematics, vol. 1080. — Un vol. broché, $16,5 \times 24$, de v, 373 p. — Prix: DM 51.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This proceedings volume contains 26 research contributions, including 2 survey articles on ergodic theorems in von Neumann algebras by R. Jajte and on stable processes and measures by A. Weron. The main themes of the papers are limit theorems for vector-valued random variables, probability measures on vector spaces, vector-valued processes, functional analysis methods in stochastic processes and ergodic theorems.

D. B. FUKS, V. A. ROKHLIN. — **Beginner's course in topology: geometric chapters.** — Translated from the Russian by A. Iacob. — Universitext. — Un vol. broché, 16,5 × 24, de xi, 519 p. — Prix: DM 88.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Based on lectures given by the authors at Moscow and Leningrad universities, this textbook gives a systematic exposition of some of the main parts of topology: general topological spaces, cellular and simplicial spaces, homotopy groups, fibre bundles, and smooth manifolds. The main purpose is to present these parts of topology as a unified whole. As a methodical innovation, a coordinate-free approach to the theory of fibre bundles and an exposition of the foundations of differential topology without use of differential equations are given. Many descriptive examples and drawings are included and each section is followed by a set of judiciously chosen exercises. The reader requires only a basic knowledge of set theory, algebra and calculus.

Advances in probability theory: limit theorems and related problems. — Edited by A. A. Borovkov. — Translation series in mathematics and engineering. — Un vol. relié, 17 × 24, de xiv, 377 p. — Prix: DM 124.00. — Optimization software, Inc, Publications Division, New York, distributed by Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Limit theorems related to the invariance principle: I. S. Borisov: Methods of a common probability space for Markov processes. — V. I. Lotov: On the asymptotics of distributions connected with the exit of a non-discrete random walk from an interval. — A. A. Mogul'skij: Large deviations of the Wiener process. — I. F. Pinelis: The rate of convergence in boundary value problems for domains with discontinuities. — A. I. Sakhanenko: On estimates of the rate of convergence in the invariance principle. — *Limit theorems for random processes and their applications:* On asymptotically optimal tests for testing complex close hypotheses, by A. A. Borovkov and A. I. Sakhanenko. — A. A. Mogul'skij: On moderately large deviations from the invariant measure. — V. A. Topchij: A local theorem for Bellman-Harris critical processes with discrete time. — V. I. Chebotarev: The estimates of the rate of convergence in a local limit theorem for the square of the norm in l_2 . — V. V. Yurinskij: Homogenization of non-divergent random elliptic operators. — *Properties of distributions and applied problems:* K. Arndt: On the distribution of the supremum of a random walk on a Markov chain. — V. M. Borodikhin: On a problem of martingales on a plane. — G. P. Karev: Quadratic variation of random sequences. — S. V. Nagaev: Probability inequalities for sums of independent random variables with values in a Banach space. — G. V. Nedogibchenko, L. Ya. Savel'ev: Inductive limits of directed systems of continuous measures. — A. I. Sakhanenko: An estimate for density of the distribution of the integral type. — S. G. Foss: Queues with customers of several types.

Byron J. T. MORGAN. — **Elements of simulation.** — Science paperbacks, vol. 194. — Un vol. broché, 15,5 × 23,5, de xiii, 351 p. — Prix: £12.95 (relié: £27.50). — Chapman and Hall, London/New York, 1984.

Simulation techniques are widely used to investigate real-life processes and to obtain accurate predictions with mathematical models. The methods employed find applications throughout the many branches of probability and statistics and are practised extensively in business and industry. This book covers all aspects of simulation, from the generation and testing of pseudo-random numbers through to their use in a variety

of applications. Recent developments in the field are discussed and the vital role of computing is emphasized throughout. Many exercises are provided, some with worked solutions, and the algorithms and techniques are illustrated by a number of computer programs written in BASIC.

Karel HRBACEK, Thomas JECH. — **Introduction to set theory.** — 2nd edition, revised and expanded. — Monographs and textbooks in pure and applied mathematics, vol. 85. — Un vol. relié, $16 \times 23,5$, de ix, 247 p. — Prix: FS 111.00. — Marcel Dekker, Inc., New York/Basel, 1984.

While maintaining the successful features of the 1st edition such as exercises of graded difficulty throughout the book, the 2nd edition offers many benefits including: a series of new sections that deal with set-theoretic properties of sets of real numbers, presenting interesting applications of abstract set theory to real analysis, and an entirely new chapter on "uncountable sets" that covers filters and ideals, closed unbounded and stationary sets, the measure problem, and large cardinals, enriching standard classroom material.

Rational points. — Seminar Bonn/Wuppertal 1983/84. — A publication of the Max-Planck Institut für Mathematik, Bonn. Edited by Gerd Faltings, Gisbert Wüstholz et al. — Aspects of mathematics, vol. E6. — Un vol. broché, 16×23 , de viii, 268 p. — DM 48.00. — Friedr. Vieweg & Sohn, Braunschweig/Wiesbaden, 1984.

This booklet consists of the notes from the seminar Bonn/Wuppertal 1983/84, about arithmetic algebraic geometry. It contains a proof for the Mordell-conjecture. It may be useful as an introduction to Arakelov's point of view in diophantine geometry. — *Contents:* Gerd Faltings: Moduli spaces. — Gerd Faltings: Heights. — Fritz Grunewald: Some facts from the theory of group schemes. — Norbert Schapparer: Tate's conjecture on the endomorphisms of abelian varieties. — Gisbert Wüstholz: The finiteness theorems of Faltings. — Gerd Faltings: Complements to Mordell. — Ulrich Stuhler: Intersection theory on arithmetic surfaces.

H. MAASS. — **Lectures on modular functions of one complex variables.** — Revised printing 1983. — Tata Institute of fundamental research lectures on mathematics and physics. — Un vol. broché, $18 \times 24,5$, de vii, 266 p. — Prix: DM 20.00. — Bombay, Tata Institute on fundamental research, distributed by Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

These lectures on modular functions given by Prof. Hans Maass in 1962/63 in Bombay and first published in 1964 were thoroughly revised and corrected by the author in cooperation with S. Raghavan. *Contents:* Horocyclic groups: The Poincaré model of the hyperbolic plane. Discontinuous groups of motions. Fundamental domain. Riemann surfaces. Meromorphic functions and differentials. — *The modular group and its subgroups:* The modular group. Subgroups of the modular group. Excursion into function theory. The elliptic modular functions. — *Modular forms of real dimension:* Modular forms and partial fraction series. Poincaré series and Eisenstein series. Metrisation and completeness theorem. The Fourier coefficients of integral modular forms. — *Non-analytic modular forms:* The invariant differential equations. Non-analytic forms. Eisenstein series. — *Dirichlet series and Euler products:* Gamma functions and Mellin transforms. Automorphic forms and Dirichlet series. The Hecke operators T_n .

S. WATANABE. — **Lectures on stochastic differential equations and Malliavin calculus.** — Tata Institute of fundamental research lectures on mathematics and physics,

vol. 73. — Un vol. broché, 18×24 , de viii, 118 p. — Prix: DM 20.00. — Tata Institute on fundamental research, Bombay, distributed by Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Calculus of Wiener functionals: Abstract Wiener space. Ornstein-Uhlenbeck operators and semigroups. Sobolev spaces over the Wiener space. Composites of Wiener functionals and Schwartz distributions. The smoothness of probability laws. — *Applications to stochastic differential equations*: Solutions of stochastic differential equations as Wiener functionals. Existence of moments for a class of Wiener functionals. Regularity of transition probabilities.

W. VOGEL. — **Lectures on results on Bezout's theorem.** — Tata Institute of fundamental research lectures on mathematics and physics, vol. 74. — Un vol. broché, $18 \times 24,5$, de viii, 136 p. — Prix: DM 20.00. — Tata Institute on fundamental research, Bombay, distributed by Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Historical introduction: The classical case. The non-classical case. — *Preliminary results*: Preliminary definitions and remarks. The general multiplicity symbol. The Hilbert function and the degree. Miscellaneous results. — *The main theorem*: The join-procedure. Consequences. — *Examples, applications and problems*: Examples. Applications of the main theorem. Problems.

S. R. S. VARADHAN. — **Large deviations and applications.** — CBMS-NSF regional conference series in applied mathematics, vol. 46. — Un vol. broché, $17,5 \times 25$, de v, 75 p. — Prix: £9.25. — Society for industrial and applied mathematics, Philadelphia, distributed by John Wiley and sons, Chichester, 1984.

Large deviations. — Cramér's theorem. — Multidimensional version of Cramér's theorem. — An infinite dimensional example: Brownian motion. — The Ventcel-Freidlin theory. — The exit problem. — Empirical distributions. — The large deviation problem for empirical distributions of Markov processes. — Some properties of entropy. — Upper bounds. — Lower bounds. — Contraction principle. — Application to the problem of the Wiener sausage. — The polaren problem. — Bibliographical remarks.

Claude GEORGE. — **Exercises in integration.** — Translated from the French by J. M. Cole. — Problem books in mathematics. — Un vol. relié, $16,5 \times 24,5$, de x, 550 p. — Prix: DM 122.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This book contains over 200 exercises in Lebesgue integration and its applications in analysis (convolution, Fourier transforms, trigonometric series). *Contents*: Outline of the course. — Measurable sets. — σ -algebras and positive measures. — The fundamental theorems. — Asymptotic evaluation of integrals. — Fubini's theorem. — The L^p spaces. — The space L^2 . — Convolution products and Fourier transforms. — Functions with bounded variation: absolutely continuous functions: differentiation and integration. — Summation processes: trigonometric polynomials. — Trigonometric series. — Among the questions covered are theories of Lyapunov, Richter, Riesz-Thorin, Titchmarsh, Hilbert transformations, the Poisson formula, and Borel and Nörlund sums.

Mathematical aspects of superspace. — Ed. by H.-J. Seifert, C. J. S. Clarke and A. Rosenblum. — NATO ASI series. Series C: Mathematical and physical sciences, vol. 132. — Un vol. relié, $16,5 \times 24,5$, de xii, 214 p. — Prix: Dfl. 95.00. — D. Reidel publishing company, Dordrecht/Boston/Lancaster, 1984. Published in cooperation with NATO scientific affairs division.

Over the past five years, through a continually increasing wave of activity in the physics community, supergravity has come to be regarded as one of the most promising ways of unifying gravity with other particle interaction as a finite gauge theory to explain the spectrum of elementary particles. Concurrently important mathematical works on the arena of supergravity has taken place, starting with Kostant's theory of graded manifolds and continuing with Batchelor's work linking this with the superspace formalism. *Contents*: J. Wess: Non-linear realization of supersymmetry. — C. J. S. Clarke: Fields, fibre bundles and gauge groups. — K. D. Elworthy: Path integration on manifolds. — M. Batchelor: Graded manifolds and supermanifolds. — A. Rogers: Aspects of the geometrical approach to supermanifolds. — A. Rogers: Integration on supermanifolds. — R. J. Blattner, J. H. Rawnsley: Remarks on Batchelor's theorem. — J. Isenberg, D. Bao, P. B. Yasskin: Classical supergravity.

Jean-Pierre FERRIER. — **Mathématiques pour la licence: variable complexe, calcul différentiel et tensoriel, espaces normés et calcul intégral, analyse de Fourier.** — Second cycle des universités et écoles d'ingénieurs. — Un vol. broché, 17×24 , de 232 p. — Prix: FF 95.00. — Masson: Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1984.

Rappels de topologie générale. — Variable complexe. — Calcul différentiel. — Tenseurs cartésiens-formes différentielles. — Espaces normes. — Théorème du point fixe. — Espaces Hilbertiens. — Séries de Fourier. — Transformation de Fourier. — Intégration. — Espaces fonctionnels.

Gérard LETAC. — **Mathématiques: première année des universités.** — Premier cycle, DEUG A Sciences des structures et de la matière: mathématiques, mécanique, informatique, physique et chimie. — Un vol. broché, $13,5 \times 21$, de 304 p. — Prix: FF 66.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1984.

Vocabulaire d'algèbre générale. — Réels, suites, limites. — Complexes, exponentielle, équations différentielles linéaires à coefficients constants. — Fonctions élémentaires. — Fonctions continues, fonctions dérivables. — Formule de Taylor et développements limités. — Intégration. — Algèbre linéaire générale. — Calcul matriciel, déterminants et équations linéaires. — Fonctions et champs de vecteurs. — Equations différentielles.

Teaching and applying mathematical modelling. — Ed. by J. S. Berry, D. N. Burghes, I. D. Huntley, D. J. G. James and A. O. Moscardini. — Ellis Horwood series in mathematics and its applications. — Un vol. relié, $16 \times 23,5$ de xvi, 491 p. — Prix: \$35.00. — Ellis Horwood limited, Chichester, distributed by John Wiley and sons, New York/Chichester/Brisbane/Toronto, 1984.

Mathematical modelling, as reflected in this unique book, follows the modern trend by encouraging students to concentrate on active, rather than passive models for practical, everyday working situations. The intention is to educate mathematics teachers taking or contemplating courses in mathematical modelling and the use of applications

in mathematics. The book deals with the development of mathematical modelling courses, and shows how mathematical applications and modelling can be incorporated into existing courses. The text, presented by a range of internationally-known experts, deals with many new mathematical models and mirrors current trends particularly with regard to incorporating the use of computers and calculators. The book will stimulate the teaching and learning of mathematical modelling in schools and in higher education. The authors offer suggestions on how the material should be taught, the design and analysis of models, with plenty of practical discussion on the problems involved, an approach not to be found elsewhere. The book stems from the First international conference on the teaching of mathematical modelling, held recently at the University of Exeter.

Josette CALAIS. — **Eléments de théorie des groupes.** — Mathématiques. — Un vol. broché, $15 \times 21,5$, de 375 p. — Presses universitaires de France, Paris, 1984.

Ce livre contient les éléments de base de la théorie des groupes; il est principalement destiné aux étudiants des premiers cycles scientifiques des universités et aux élèves des classes préparatoires aux Grandes écoles. Néanmoins, les derniers chapitres dépassent le cadre des propriétés élémentaires des groupes et s'adressent davantage aux étudiants de licence et maîtrise des mathématiques. Pour permettre à un étudiant de travailler éventuellement seul, les démonstrations ont été volontairement très détaillées et, à la fin de chaque chapitre, les exercices offrent une possibilité de contrôle des connaissances acquises, ainsi qu'une ouverture vers certaines applications des groupes. *Contenu*: Structure de groupe. — Classes modulo un sous-groupe. — Groupes monogènes. Groupes symétriques S_n . Groupes diédraux. — Sous-groupes normaux. — Groupe opérant sur un ensemble. — Groupes finis. Théorèmes de Sylow. — Suites de composition. — Groupes abéliens. — Groupes libres. Générateurs et relations. Produit libre de groupes.

Daniel S. FREED, Karen K. UHLENBECK. — **Instantons and four-manifolds.** — Mathematical sciences research institute publications, vol. 1. — Un vol. relié, 16×24 , de x, 232 p. — Prix: DM 48.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This book which is the first volume on the new series MSRI publications, presents background material and detailed proofs involving Simon Donaldson's theorem on "non-smoothability" of certain topological four-manifolds which provides an introduction to gauge field theories and brings together basic tools in analysis, differential geometry and topology. — *Contents*: Fake R^4 . — The Yang-Mills equations. — Manifolds of connections. — Cones on CP^2 . — Orientability. — Introduction to Taubes' theorem. — Taubes' theorem. Compactness. — The collar theorem. — The technique of Fintushel and Stern. — *Appendices*: The group of Sobolev gauge transformations. The Pontrjagin-Thom construction. Weitzenböck formulas. The removability of singularities. Topological remarks.

L. R. FOULDS. — **Combinatorial optimization for undergraduates.** — Undergraduate texts in mathematics. — Un vol. relié, 16×24 , de xii, 227 p. — Prix: DM 108.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This is a book on combinatorial optimization written especially for undergraduates. It covers the main combinatorial optimization techniques, such as linear and integer programming, dynamic programming, graph theory and heuristic problem solving. These

techniques are applied to various problems in operations research, engineering and biology and includes such classics as the travelling salesman problem, the vehicle scheduling problem, facilities layout, car pooling and evolution. The approach in the book is practical, using many intuitive arguments and illustrative numerical examples. — Contents: *Techniques*: Introduction to the techniques of combinatorial optimization. Linear programming and extensions. Solution techniques. Optimization on graphs and networks. — *Applications*: Some applications of combinatorial optimization techniques.

D. W. STROOK. — **An introduction to the theory of large deviations.** — Universitext. — Un vol. broché, $15,5 \times 23,5$, de vii, 196 p. — Prix: DM 56.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

Introduction. — Brownian motion in small time. Strassen's iterated logarithm. — Large deviations, some generalities. — Cramer's theorem. — Large deviation principle for diffusions. — Introduction to large deviations from ergodic phenomena. — Existence of a rate function. — Identification of the rate function. — Some non-uniform large deviation results. — Logarithmic Sobolev inequalities.

P. BREMAUD. — **Introduction aux probabilités : modélisation des phénomènes aléatoires.** — Un vol. broché, $16,5 \times 24$, de xv, 334 p. — Prix: DM 45.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

La présentation de ce livre, bien qu'utilisant le formalisme moderne, ne fait pas appel à une connaissance préalable de la théorie de la mesure et de l'intégration. En revanche l'auteur insiste sur l'aspect essentiel de la modélisation, à l'aide d'exercices variés en génétique (processus de branchement), en théorie des communications (transmission de données, codage), en théorie du signal (filtre de Kalman-Bucy), en recherche opérationnelle (fils d'attente), etc. Une dernière caractéristique importante de ce livre, est la présence d'une centaine d'exercices avec solutions détaillées. Ce livre s'adresse aux élèves-ingénieurs ou aux étudiants qui ne se destinent pas à priori à une carrière en mathématiques.

P. E. CONNER, R. PERLIS. — **A survey of trace forms of algebraic number fields.** — Series in pure mathematics, vol. 2. — Un vol. broché, $16 \times 23,5$, de ix, 316 p. — Prix: £17.65. — World scientific publishing Co Pte Ltd., Singapore, distributed by John Wiley and Sons, Chichester, 1984.

The Witt class of a trace form. — The Hasse-Witt invariant of a trace form. — Examples of trace forms on extensions of \mathbb{Q} . — The integral trace form on a cyclic extension of odd prime degree. — Normal extensions and equivariant Witt rings. — Examples and applications of trace form considerations.

H. BELKNER, S. BREHMER. — **Lebesguesche Integrale.** — Un vol. broché, $14,5 \times 20$, de 151 p. — VEB Deutscher Verlag der Wissenschaften, Berlin, 1984.

Begriff und Eigenschaften Lebesguescher Integrale. — Lebesgue-messbare Mengen und Lebesgue-messbare Funktionen. — Konstruktion Lebesguescher Integrale. — Das zweidimensionale Lebesguesche Integral. — Lösungen der Aufgaben.

I. I. BLECHMAN, A. D. MYSKIS, Ja G. PANOVKO. — **Angewandte Mathematik: Gegenstand, Logik, Besonderheiten.** — Un vol. broché, $16,5 \times 23$, de 350 p. — VEB Deutscher Verlag der Wissenschaften, Berlin, 1984.

Logik der angewandten Mathematik: Die angewandte und die theoretische Richtung in der Entwicklung der Mathematik. Über die Unterschiede einiger Vorgehensweisen in der reinen und der angewandten Mathematik. Das rationale Schliessen. — *Etappen der angewandten mathematischen Untersuchung*: Die mathematische Formulierung eines Problems. Wahl der Untersuchungsmethoden. Analyse und Interpretation der mathematischen Ergebnisse. — *Einige subjektive Probleme*: Fehler, Probleme bei der Ausbildung von Spezialisten. Nachwort von W. W. Nowoschilow.

Transactions of the 9th Prague conference on information theory, statistical decision functions, random processes, held at Prague, from June 28 to July 2, 1982, vol. A and vol. B. — Edited by J. Kozesnik. — 2 vol. reliés, 17,5 × 24,5, de 332 p. et 310 p. — Prix: Dfl. 125.00 chaque volume. — D. Reidel publishing company, Dordrecht/Boston/Lancaster, 1983.

This conference was organized by the Institute of information theory and automation of the Czechoslovak Academy of Sciences. Similarly as the preceding Prague conferences, during their 26 years history, it provided a space for the presentation and discussion of recent scientific results, as well as for personal contacts of many scientists both from abroad and from Czechoslovakia. Nearly 150 specialists from 17 countries participated in the conference and they read more than 100 papers (including 18 invited ones), 88 of which have been published in the present two volumes of the transactions of the conference. Namely invited papers, having been read by outstanding specialists, have brought invaluable offer for participants to create themselves an orientation in the modern trends of the above mentioned scientific branches.

TEMAM, Roger. — **Navier-Stokes equations: theory and numerical analysis.** — Studies in mathematics and its applications, vol. 2. — Third revised edition. — Un vol. broché, 15 × 22,5, de XII, 526 p. — Prix: Dfl. 100.00 (relié: Dfl. 220.00). — North-Holland, Amsterdam/New York/Oxford, 1984.

Since the original publication of this classic work, numerous articles have appeared, connected with the theory or the numerical approximation of the Navier-Stokes equations. The increasing interest is due in part to the important role that they play in many scientific and industrial applications of current interest, such as aeronautical sciences, meteorology, thermo-hydraulics, the petroleum industry and plasma physics. It is also due to the development of computational fluid dynamics, the process of solving problems in fluid dynamics numerically on a computer. This 3rd revised edition contains an expanded bibliography and has been brought up to date with reviews of recent progress.

GOLDBLATT, Robert. — **Topoi: the categorial analysis of logic.** — Studies in logic and the foundations of mathematics, vol. 98. — Revised edition. — Un vol. relié, 16 × 23, de XIV, 552 p. — Prix: Dfl. 180.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

The first of its kind, this book presents a completely introductory and widely accessible exposition of topos theory aimed at the philosopher-logician as well as the mathematician. It is suitable for individual study or use in class at the graduate level (it includes 450 exercises). This 2nd edition contains a new chapter, entitled "logical geometry", which introduces the reader to the theory of geometric morphisms of Grothendieck topoi, and its model-theoretic rendering by Makkai and Reyes. — *Contents*: Mathematics = set theory? — What categories are. — Arrows instead of epsilon. — Introducing topoi. —

Topos structure: first steps. — Logic classically conceived. — Algebra of subobjects. — Intuitionism and its logic. — Functors. — Set concepts and validity. — Elementary truth. — Categorical set theory. — Arithmetic. — Local truth. — Adjointness and quantifiers. — Logical geometry.

J. C. Maxwell, the sesquicentennial symposium: new vistas in mathematics, science and technology. — Edited by M. S. Berger. — Un vol. relié, 16 × 23, de xiv, 279 p. — Prix: Dfl. 150.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

Quotations from Maxwell. — Einstein's quotations about Maxwell. — Maxwell's equations: F. Dyson: The Maxwell equations. J. Stachel: The general covariant form of Maxwell's equations. — Phenomena in nonlinear science: L. Cooper: Neuron learning to network organizations. H. McKean: Boussinesq's equation: how it blows up? — Problems for nonlinear generalizations of Maxwell's equations: S. Adler: Non-Abelian statics. M. S. Berger: The confinement problem in nonlinear Gauge theories. O. Betancourt and P. Garabedian: Confinement and nonlinear stability of stellarator plasmas. — Modern high technology and Maxwell: W. Fichtner: Semiconductor equations, capacitance matrices and numerical simulations. R. Keyes: The impact of Maxwell on computer science and technology. M. Wilkes: Reflections on Maxwell. — Maxwell and geometry: A. Lichnerowicz: Maxwell and geometrical dynamics. R. Penrose: Integral for general relativistic sources. I. E. Segal: Maxwell's influence on geometry. C. N. Yang: Geometry and physics.

WILLE, Friedrich. — Eine mathematische Reise in Cantors Paradies, Zenons Hölle und andere Erholungsgebiete. — Kleine Vandenhoeck-Reihe, vol. 1505. — Un vol. broché, 11,5 × 19, de 119 p. — Prix: DM 12.80. — Vandenhoeck und Ruprecht, Göttingen, 1984.

Das Bändchen gibt einen Überblick über Mathematik in erzählerischer Form und bringt viele Beispiele dazu, eingebunden in eine Reiseerzählung. Die Fahrt geht nach Cantor-Land, einem perfekten Fleckchen Erde mit abzählbar vielen Bergen, wohlgeordneten Städten und realen Preisen. Ein unendlich grosses Einkommen ist dort keine Seltenheit. Auch Achilles hat neuen Ärger mit seiner Schildkröte, während der vom „kleinen Fermat“ einstudierte Volkstanz eine zahlentheoretische Augenweide ist. Die Episoden dieser Reise verdeutlichen, dass viele mathematische Inhalte durch kleine Geschichten lebendiger, anschaulicher und leichter verständlich werden. Insbesondere Grundfragen, die an der Grenze zur Philosophie liegen, zeigen ihren Kern in erzählter Form oft klarer.

Perspectives in mathematics: anniversary of Oberwolfach, 1984. — Edited by W. Jäger, J. Moser, R. Remmert. — Un vol. relié, 17 × 24, de 587 p. — Prix: FS 115.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

H. Gericke: Das Mathematische Forschungsinstitut Oberwolfach. — Th. F. Banchoff: Differential geometry and computer graphics. — O. E. Barndorff-Nielsen, D. R. Cox: The role of mathematics in theoretical statistics. — S. Bosch: Rigid analytic geometry. — S. K. Donaldson: The Yang-Mills equations on Euclidean space. — J. Eells: Gauss maps of surfaces. — G. Faltings: Neuere Fortschritte in der diophantischen Geometrie. — S. Feferman: Foundational ways. — H. Föllmer: Von der Brownschen Bewegung zum Brownschen Blatt: einige neuere Richtungen in der Theorie der stochastischen Prozesse. — O. Forster und K. Stein: Entwicklungen in der komplexen Analysis mehrerer Veränderlichen. — L. Gårding: Hyperbolic differential operators. — M. Grötschel: Developments in combinatorial optimization. — K.-P. Hadeler: Spread and age structure

in epidemic models. — *St. Hildebrandt*: Calculus of variations today, reflected in the Oberwolfach meetings. — *H.-W. Knobloch, E. Thoma*: Aspects of modern control theory. — *N. H. Kuiper*: Geometry in total absolute curvature theory. — *P. Roquette*: Some tendencies in contemporary algebra. — *B. Simon*: Fifteen problems in mathematical physics. — *T. A. Springer*: Linear algebraic groups. — *R. J. Stern*: Gauge theories as a tool for low dimensional topologists. — *V. Strassen*: Algebraische Berechnungskomplexität. — *M. Waldschmidt*: Algebraic independence of transcendental numbers. Gel'fond's method and its developments. — *E. Zehnder*: Fixed points of symplectic maps and a classical variational principle for forced oscillations.

General inequalities 4: in memoriam Edwin F. Beckenbach. — 4th international conference on general inequalities, Oberwolfach, May 8-14, 1983. — Edited by W. Walter. — International series of numerical mathematics, vol. 71. — Un vol. relié, 17 × 24, de XXI, 434 p. — Prix: FS 78.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

Rather than being a separate branch of mathematics, inequalities occur in almost every mathematical field. The articles of the present volume reflect this wide range of subjects and applications. The book begins with an article in memoriam Edwin F. Beckenbach. Questions from the classical range of inequalities are taken up in the sections "Inequalities for sums and integrals" and "Inequalities in analysis and approximation". They are followed by sections on "Inequalities of functional analysis" and "functional inequalities". Problems from differential equations are treated in the section "Inequalities for differential operators" and applications from different fields compose the last section "Inequalities in economics, optimization and applications". The book closes with a stimulating problems and remarks section.

Harold ASCHER, Harry FEINGOLD. — **Repairable systems reliability: modeling, inference, misconceptions and their causes.** — Lecture notes in statistics, vol. 7. — Un vol. broché, 17,5 × 25,5, de XIV, 223 p. — Prix: FS 119.00. — Marcel Dekker, Inc., New York/Basel, 1984.

According to the authors of this book, most reliability practitioners, and even many theoreticians, do not understand that the mathematical formulation of this concept must be in terms of the properties of nonstationary stochastic point processes rather than properties of cumulative distribution functions. This book clarifies the basic concepts of repairable systems and highlights its practical applications. — *Contents*: Scope. — Terminology, notation and basic models. — Probabilistic modeling of repairable systems. — Shortcomings of probabilistic modeling of repairable systems reliability. — Statistical analysis of repairable systems failure data. — Reliability growth. — Repairable systems cost models. — Misconceptions, reliability terminology. — Future work.

F. VAN OYSTAEYEN, A. VERSCHOREN. — **Relative invariants of rings: the non-commutative theory.** — Pure and applied mathematics, vol. 86. — Un vol. relié, 16 × 23,5, de XII, 286 p. — Prix: FS 162.00. — Marcel Dekker, Inc., New York/Basel, 1984.

The book presents new methods to infer information about the structure of a ring from knowledge of the structure of certain groups called relative invariants of the ring. Beginning with a full examination of the theory of relative Picard groups, this volume considers relative Azumaya algebras and the application of relative cohomology, the construction of new graded orders, and central class groups of a maximal order over a Krull domain.

Michael J. GREENACRE. — **Theory and applications of correspondence analysis.** — Un vol. relié, 15,5 × 23,5, de XI, 364 p. — Prix: \$56.00. — Academic press, London/Orlando/San Diego/San Francisco/New York/Toronto/Montréal/Sydney/Tokyo/Sao Paulo, 1984.

Introduction. — *Geometric concepts in multidimensional space:* Vectors and multidimensional space. Distance, angle and scalar product. Weighted Euclidean space. Assigning masses (weights) to vectors. Identifying optimal subspaces. — *Simple illustrations of correspondence analysis:* A typical problem. The dual problem. Decomposition of inertia. Further illustration of the geometry. — *Theory of correspondence analysis and equivalent approaches:* Algebra of correspondence analysis. Reciprocal averaging. Dual (or optimal) scaling. Canonical correlation analysis. Simultaneous linear regressions. — *Multiple correspondence analysis:* Bivariate indicator matrices. Multivariate indicator matrices. Analysis of questionnaires and non-responses. Recoding of heterogeneous data. — *Correspondence analysis of ratings and preferences:* Doubling, and its associated geometry. Comparison with other scaling techniques. — *Use of correspondence analysis in discriminant analysis, classification, regression and cluster analysis.* — *Special topics:* Stability and statistical inference. Reweighting and focusing. Horseshoe effect. Imposing additional constraints. Treatment of missing data. Analysis of symmetric matrices. Analysis of large data sets. — *Applications of correspondence analysis:* Eye colour and hair colour of 5387 schoolchildren. Principal worries of Israeli adults. Ratings of analgesic drugs. Multidimensional time series. Patterns in examination marks. Protein consumption in Europe and Russia. Seriation of the works of Plato. Antelope census data in African game reserves. HLA gene frequency data in population genetics. Measurements on fossil skulls, with missing data. Graphical weather forecasting. References to published applications. — *Appendices:* Singular value decomposition and multidimensional analysis. Aspects of computation. — Exemples à la fin de chaque chapitre.

James W. LONGLEY. — **Least squares computations using orthogonalization methods.** — Lecture notes in pure and applied mathematics, vol. 93. — Un vol. broché, 17,5 × 25,5 de XI, 308 p. — Prix: FS 162.00. — Marcel Dekker, Inc., New York/Basel, 1984.

This book details the mathematics of the Gram-Schmidt process, while demonstrating the similarities among all orthogonalization methods. At the same time, this work illustrates the wide variety of options available by utilizing different processes, and presents important guidelines to this key flexibility. The volume is packed with ready-to-use algorithms, easily programmable into mini-computers and easier to work with than statistical package programs. The author shows how to modify the numerous illustrative examples to specific situations, without being an expert in FORTRAN. Moreover, programs with variable dimension statements help you take increased advantage of computer time.

Robert A. McLEAN, Virgil L. ANDERSON. — **Applied factorial and fractional designs.** — Statistics: textbooks and monographs, vol. 55. — Un vol. relié, 19 × 26, de 373 p. — Marcel Dekker, Inc., New York/Basel, 1984.

Packed with comprehensive lists of fractional factorial designs useful in almost any setting, chapters present actual applications with restructured data for easier calculations. And this material is buttressed by three key National Bureau of standards tables. — *Contents:* 2ⁿ factorial experiments (complete and incomplete blocks). — Fractional factorial experiments for two-leveled factors (numerator of fractions is one). — Three-level

factorial experiments. — Mixed factorial experiments and other incomplete block designs. — Fractional factorial experiments for factors with two levels (numerator of fractions greater than one). — Appendices: Fractional factorial designs for experiments with factors at two and three levels. Fractional factorial experiment designs for factors at three levels, for factors at two levels. Partially nonorthogonal designs.

D. J. HALLENBECK, T. H. MAC GREGOR. — **Linear problems and convexity techniques in geometric function theory.** — Monographs and studies in mathematics, vol. 22. — Un vol. relié, 16 × 24, de xvii, 182 p. — Prix: £26.50. — Pitman advanced publishing program, Boston/London/Melbourne, 1984.

This book contains results in complex analysis generally associated with geometric function theory, concentrating on those involving linearity or convexity techniques. The problem of finding the extreme points of families of analytic functions is emphasized, together with the application of that information to the solution of linear extremal problems. The idea of subordination forms a central topic throughout the book. Some classical results are presented, but the main developments are relatively new, many results being obtained concurrently with the last stages of developing the book. — *Contents*: Elementary properties of univalent functions. — Special families of univalent functions. — Subordination and the Herglotz formula. — The linear topological structure of the set of analytic functions. — Extreme points and closed convex hulls of several classes. — Applications to extremal problems. — Support points of several classes. — Subordination, extreme point theory and H^p spaces. — Variability regions for families of analytic functions.

Gabor TOTH. — **Harmonic and minimal maps: with applications in geometry and physics.** — Translation editor: T. J. Willmore. — Ellis Horwood series in mathematics and its applications. — Un vol. relié, 16 × 23,5, de v, 342 p. — Prix: £30.00. — Ellis Horwood Limited, Chichester, distributed by John Wiley & Sons, New York/Brisbane/Chichester/Toronto, 1984.

This book is primarily concerned with the relation between harmonicity and minimality, an area which has received little coverage in research literature. After a description of the basic material on the general theory of differential operators on vector bundles, the author develops a generalised Hodge-de Rham theory, which leads naturally into the concept of harmonicity of maps. The theories of harmonic and minimal maps are then developed via the calculus of variations: after which the concepts of rigidity and deformation of harmonic maps are introduced. Appendices describe the basic concepts of Yang-Mills fields, and methods of the calculus of variations described earlier are applied to give proof of Simons' instability theorem. An excellent bibliography completes the work.

Byron J. T. MORGAN. — **Elements of simulation.** — Science paperbacks, vol. 194. — Un vol. broché, 23,5 × 15,5, de xiii, 351 p. — Prix: £12.95. — Chapman and Hall, London/New York, 1984.

This book covers all aspects of simulation, from the generation and testing of pseudo-random numbers through to their use in a variety of applications. Recent developments in the field are discussed and the vital role of computing is emphasized throughout. Many exercises are provided, some with worked solutions, and the algorithms and techniques are illustrated by a number of computer programs written in BASIC. The text is extensively referenced and a guide to computer library routines for various procedures is given in the appendix.

Differential equations. — Proceedings of the conference held at the University of Alabama in Birmingham, Birmingham, Alabama, U.S.A., 21-26 March, 1983. — Edited by Ian W. Knowles, and Roger T. Lewis. — North-Holland mathematics studies, vol. 92. — Un vol. broché, 16,5 × 24, de xx, 608 p. — Prix : Dfl. 160.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

Under the general heading of the equations of mathematical physics, contributions are included on a broad range of topics in the theory and applications of ordinary and partial differential equations, including both linear and nonlinear equations. The topics cover a wide variety of methods (spectral theory, variational, topological, semi-group), and an equally wide variety of equations including the Laplace equation, Navier-Stokes equations, Boltzmann's equation, reaction-diffusion equations, Schroedinger equations, and certain non-linear wave equations. A significant number of papers are devoted to multi-particle scattering theory. In addition, many of the plenary lectures contain a significant amount of survey material on these topics.

N. BOCCARA. — **Analyse fonctionnelle: une introduction pour physiciens.** — Un vol. broché, 17,5 × 26, de 319 p. — Prix : FF 175.00. — Ellipses, Paris, 1984.

Destinée aux physiciens, cette initiation aux méthodes de l'analyse fonctionnelle traite de la théorie de l'intégration, des espaces de Lebesgue et de Hilbert, des distributions et des opérateurs linéaires. L'accent est mis sur l'aspect pratique des résultats illustrés par de nombreux exemples. Les exercices proposés sont accompagnés de leurs solutions.

Khoan VO KHAC. — **Mesure, intégration, convolution et analyse de Fourier: interprétation dans le langage des probabilités: théorie détaillée accompagnée de nombreux exercices.** — Un vol. broché, 17,5 × 26, de 255 p. — Prix : FF 165.00. — Ellipses, Paris, 1984.

Clans et tribus. — Propriétés élémentaires des mesures. — Prolongements de mesures. — Applications mesurables. — Théorèmes de base de l'intégration. — Espaces fonctionnels de Lebesgue. — Représentations. — Liaison entre les mesures. — Changement de variables pour la mesure de Lebesgue. — Mesures de Borel-Radon. — Convergence étroite et convolution. — Transformation de Fourier. — Transformation de Fourier réduite. — Séries de Fourier. — Cas où la période est différente de l'unité.

Alan BAKER. — **A concise introduction to the theory of numbers.** — Un vol. broché, 13,5 × 21,5, de xiii, 95 p. — Prix : £4.95 (relié : £15.00). — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

In this book, the author describes the rudiments of number theory in a concise, simple and direct manner. Though most of the text is classical in content, he includes many guides to further study which will stimulate the reader to delve into the great wealth of literature devoted to the subject.

T. S. BLYTH, E. F. ROBERTSON. — **Algebra through practice: a collection of problems in algebra with solutions**, volume 1, books 1, 2 & 3. — Un vol. relié, 16 × 21,5, de x, 95 p. — Prix : £20.00. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

With this series of books the authors have provided a selection of problems with complete solutions and test papers designed to be used with or instead of standard

textbooks on algebra. For the convenience of the reader, a key explaining how the present books may be used in conjunction with some of the major textbooks is included. Each book of problems is divided into chapters that begin with some notes on notation and prerequisites. The majority of the material is aimed at the student of average ability but there are some more challenging problems. — *Contents*: Sets, relations and mappings. — Matrices and vector spaces. — Groups, rings and fields.

G. KALMBACH. — **Orthomodular lattices.** — London mathematical society monographic series, vol. 18. — Un vol. relié, 16 × 23,5, de viii, 390 p. — Prix: \$65.00. — Academic press, London/New York/Paris/San Diego/San Francisco/Sao Paulo/Sydney/Tokyo/Toronto, 1983.

ORTHOSTRUCTURES: Orthomodular lattices. — Blocks. — Closed subspaces of Hilbert space. — ALGEBRAIC ASPECTS: Congruence relations and p -ideals. — Distributive subsets and interval isomorphisms. — The V and S relations. — Equational classes of orthomodular lattices. — GEOMETRIC ASPECTS: Atoms. — Dimension theory. — Complete modular ortholattices are continuous geometries. — Modularity and dimension. — LOGICAL ASPECTS: Free ortholattices. — Orthomodular logic. — Foulis-Randall spaces. — MISCELLANEOUS: Measures and states. — Foulis semigroups. — Block-finite orthomodular lattices. — Programs: *I. G. Beuttenmüller*: Orthomodular lattices of height 3 with n blocks. *M. Dichtl*: Pasting together Boolean algebras. *H. Jürgensen and J. Loewer*: Drawing Hasse diagrams of partially ordered sets. — Problems on orthomodular lattices.

B. S. EVERITT. — **An introduction to latent variable models.** — Monographs on statistics and applied probability. — Un vol. relié, 14,5 × 22, de vi, 107 p. — Prix: £9.50. — Chapman and Hall, London/New York, 1984.

General introduction: Latent variables and latent variable models. The role of models. The general latent model. A simple latent variable model. Estimation and goodness-of-fit. Path diagrams. — *Factor analysis*: Explanatory and confirmatory factor analysis. The factor analysis model. Identifiability of the factor analysis model. Estimating the parameters in the factor analysis model. Goodness-of-fit tests. Rotation of factors. Numerical examples. Confirmatory factor analysis. — *The LISREL model*: Identification. Estimating the parameters in the LISREL model. Instrumental variables. Numerical examples. Assessing goodness-of-fit. Multigroup analysis. — *Latent variable models for categorical data*: Factor analysis of binary variables. Latent structure models. — *Some final comments*: Assessing the fit of latent variable models by cross-validation procedures. Latent variables — fact or fiction? Résumé à la fin de chaque chapitre.

Enrico GIUSTI. — **Minimal surfaces and functions of bounded variation.** — Monographs in mathematics, vol. 80. — Un vol. relié, 17 × 24, de xii, 240 p. — Prix: FS 84.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

Various methods of treating the classical problem of minimal surfaces have been developed in recent years. This work follows the method introduced by De Giorgi, placed in the framework of functions of bounded variations and sets of finite perimeter. The book provides a firsthand account of the theory of parametric and non-parametric minimal surfaces of codimension one in euclidean spaces of arbitrary dimension. The book is divided into two parts. The first, devoted to parametric minimal surfaces, treats existence and regularity almost everywhere of solutions to the Plateau problem, minimal cones, and the dimension of the singular set. The second part, dealing with non-parametric

minimal surfaces, discusses the Dirichlet problem for the minimal surface equation, emphasizing variational methods, a priori estimates for the gradient, and the Bernstein problem for entire solutions.

Wolfgang M. SCHMIDT. — **Analytische Methoden für Diophantische Gleichungen: einführende Vorlesungen.** — DMV Seminar, vol. 5. — Un vol. broché, 17×24 , de VIII, 122 p. — Prix: FS 26.00. — Birkhäuser Verlag, Basel Boston Stuttgart, 1984.

Das vorliegende Büchlein ist aus Vorlesungen hervorgegangen, welche der Autor im Sommersemester 1983 in Wien und dann in verkürzter Fassung an einem DMV-Seminar in Düsseldorf zusammen mit H. P. Schlickewei gehalten hat. *Contents*: Das Waringsche Problem. — Kongruenzen und p -adische Dichte. — Exponentialsummen, Kongruenzen und Gleichungen. — Beweis des Hauptsatzes über die Invariante h .

Helmut WEGMANN und Jürgen LEHN. — **Einführung in die Stochastik.** — Moderne Mathematik in elementarer Darstellung, vol. 21. — Un vol. broché, $15,5 \times 23,5$, de XI, 226 p. — Prix: DM 29.80. — Vandenhoeck und Ruprecht, Göttingen, 1984.

Das Buch entstand auf der Grundlage eines Vorlesungsskriptums zu einer einführenden Vorlesung über stochastische Methoden, die in den letzten Jahren an der Technischen Hochschule Darmstadt mehrfach für Studierende der Mathematik in den Lehramtstudiengängen gehalten wurde. Ziel dieser Veranstaltungen war es, die Hörer mit den Ideen der Modellbildung in der Stochastik vertraut zu machen und ihr Interesse für die Anwendungsmöglichkeiten stochastischer Denkweisen und Verfahren zu wecken. — *Contents*: Aufgabenstellung und Grundbegriffe der Stochastik. — Methoden der Modellbildung. — Verfahren der Statistik. — Kennzahlen von Verteilungen. Berechnung von Näherungswerten für Wahrscheinlichkeiten. — Allgemeine stochastische Modelle. — Lösungshinweise zu den Aufgaben.

Claude DELLACHERIE et Paul-André MEYER. — **Probabilités et potentiel**, chapitres IX à XI, édition entièrement refondue: Théorie discrète du potentiel. — Actualités scientifiques et industrielles, vol. 1410. — Un vol. broché, $17,5 \times 24$, de 244 p. — Prix: FF 130.00. — Hermann, Paris, 1983.

Ce volume contient la partie C du traité de grandes dimensions, « Probabilités et potentiel ». Elle comprend un chapitre consacré à la théorie discrète, un autre traitant de la théorie générale des réduites et du balayage, et un troisième consacré aux développements récents de la théorie des capacités. Les théories générales présentées dans ce volume sont illustrées par des applications d'une part à la théorie ergodique ponctuelle, d'autre part à la représentation intégrale dans les cônes convexes et à ses applications analytiques. *Sommaire*: Noyaux et fonctions excessives. — Théorie des réduites et du balayage. — Méthodes nouvelles en théorie des capacités, application aux maisons de jeu.

Alfred RÉNYI. — **A diary on information theory.** — Un vol. relié, $17 \times 24,5$, de 191 p. — Prix: \$22.50. — Akadémiai Kiado, Budapest, 1984.

This book may be of interest not only to mathematicians, but to laymen as well. The author, the late Alfred Rényi, an outstanding Hungarian mathematician, always wanted to bring mathematics close to as many people as possible. The first paper in the book, entitled "On the mathematical notion of information", is the diary of a "university student", who is just becoming acquainted with his subject. Rényi chose to convey his

thoughts via a student of his. The book also contains other stimulating articles: their message is how one can come to like mathematics. Even readers lacking the necessary knowledge to follow them all the way through will find sufficient incisive thoughts in them. Rényi's intention was to explain, among other things, what mathematics is, how it can contribute to our everyday life, how it can further the development of our thinking. Readers will also enjoy the fascinating style of the book.

Alan RUEGG. — **Probabilités et statistique.** — Méthodes mathématiques pour l'ingénieur, vol. 4. — Un vol. broché, 16×24 , de xi, 153 p. — Prix: FS 34.00. — Presses polytechniques romandes, Lausanne, 1985.

Cet ouvrage a pour but d'initier le lecteur aux concepts et aux méthodes fondamentales du calcul des probabilités et de la statistique. Il s'adresse avant tout aux étudiants ingénieurs du premier cycle universitaire, la matière présentée étant une contribution essentielle à leur formation mathématique. En outre, ce texte permet à des ingénieurs de l'industrie de compléter leurs connaissances dans ces domaines. Les différents sujets traités sont: les notions fondamentales d'événement, de probabilité et de probabilité conditionnelle, les variables aléatoires, discrètes et continues, les vecteurs aléatoires, des méthodes d'approximation basées sur le théorème central limite, l'estimation ponctuelle et par intervalle et quelques méthodes de tests d'ajustement et de tests paramétriques. L'ouvrage donne en plus une brève introduction à la théorie de la fiabilité qui constitue aujourd'hui un domaine d'application important des méthodes probabilistes.

M. J. TOMKINSON. — **FC-groups.** — Research notes in mathematics, vol. 96. — Un vol. broché, $17 \times 24,5$, de viii, 171 p. — Prix: £8.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1984.

The first part of the book gives a connected account of results of Hall, Gorbakov and the author concerning the question of which *FC*-groups are isomorphic to a subgroup or section of a direct product of finite groups. The author then goes on to include other topics on *FC*-groups to illustrate the techniques now available in this area. Three chapters are concerned with inverse limit arguments, while the theme of the last chapter is the use of results from combinatorial set theory. Throughout the book there are new proofs of known results, and the author includes twenty-five open problems.

W. E. FITZGIBBON III. — **Partial differential equations and dynamical systems.** — Research notes in mathematics, vol. 101. — Un vol. broché, $17 \times 24,5$, de viii, 366 p. — Prix: £14.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1984.

The book consists of a series of articles by internationally known mathematicians and mathematical scientists, based on lectures given during a year-long program at the University of Houston. The articles have been selected to represent the wide spectrum of activity in partial differential equations and dynamical systems, ranging from the applied to the theoretical in nature. Some articles treat computational aspects of problems, while others emphasize the qualitative features. Specific areas of application covered include astrophysics, chemical engineering, chemical physics, engineering mechanics, fluid mechanics, mathematical physics, petroleum engineering and population biology.

F.-A. POTRA, V. PTAK. — **Nondiscrete induction and iterative processes.** — Research notes in mathematics, vol. 103. — Un vol. broché, $17 \times 24,5$, de x, 207 p. — Prix: £9.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1984.

This research note presents a unified theory of iterative constructions based on a new approach, the method of nondiscrete mathematical induction. The theory is based on a new way of measuring convergence of iterative processes. A rate of convergence is defined as a function, not just a number, enabling substantially better error estimates to be made than by the classical approach. The first part of the book carefully explains the principles of application of this method and its relation to some classical principles of functional analysis. A generalization of the closed graph theorem as well as the classical Newton method are treated in detail. Two chapters are devoted to an explanation of the new notion of rate of convergence and its comparison with the classical orders of convergence. The following chapters provide a collection of applications of the method including some of the most important iterative process of numerical analysis.

C. W. GROETSCH. — **The theory of Tikhonov regularization for Fredholm equations of the first kind.** — Research notes in mathematics, vol. 105. — Un vol. broché, $17 \times 24,5$, de xiv, 104 p. — Prix: £7.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1984.

Introduction and preliminaries: Equations of the first kind; ill-posed problems. Linear operators in Hilbert space. Generalized inverses. — *A general regularization method:* Convergence results and rates. Regularization with inexact data. Some examples. — *Tikhonov regularization:* Tikhonov's method. Saturation and converse results. The discrepancy principle. Use of differential operators. — *Finite dimensional approximations:* Finite rank approximations. A regularized Ritz approach. Marti's method. Moment discretization and cross validation.

A. DOUGLIS and E. B. FABES. — **A layering method for viscous, incompressible L_p flows occupying R^n .** — Research notes in mathematics, vol. 108. — Un vol. broché, $17 \times 24,5$, de xii, 171 p. — Prix: £8.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1984.

This research note uses comparatively elementary constructions of the layering variety to approximate viscous, incompressible L_p flows occupying R^n . First, the Navier-Stokes equations are reduced to perturbations of the heat equation by use of a known operator that projects each space of L_p vectors onto its subspace of weakly solenoidal L_p vectors. By adapting a layering procedure previously given for parabolic PDEs, the flows are then approximated by comparatively elementary processes, in which diffusive and convective motions are treated separately. Starting at an initial instant, a time interval is established within which, after a moment's delay, the approximate flows obtained converge uniformly to a limit Navier-Stokes flow as desired. They also converge in various L_p modes. Spatial derivatives of first and higher orders of the approximate solutions converge similarly as do temporal-difference quotients of the approximate flows and their spatial derivatives.

Nonlinear partial differential equations and their applications, Collège de France Seminar, vol. 6. — Edited by H. Brezis and J. L. Lions, coordinated by D. Cioranescu. — Research notes in mathematics, vol. 109. — Un vol. broché, $17 \times 24,5$, de vi, 323 p. — Prix: £13.95. — Pitman advanced publishing program, Boston/Melbourne, 1984.

This book contains the texts of selected lectures delivered at a weekly seminar held at the Collège de France. It includes contributions by leading experts from various centres on recent results in nonlinear functional analysis and partial differential equations. The

emphasis is on applications to numerous fields including control theory, theoretical physics, fluid mechanics, free boundary problems, dynamical systems, numerical analysis and engineering. The book will be of particular interest to postgraduate students and specialists in these areas.

S. E. PAYNE and J. A. THAS. — **Finite generalized quadrangles.** — Research notes in mathematics, vol. 110. — Un vol. broché, 17 × 24,5, de viii, 312 p. — Prix: £14.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1984.

This research note presents a complete treatment of finite generalized quadrangles from a combinatorial and geometric point of view. The book begins with elementary, synthetic axioms and uses simple counting arguments and standard eigenvalue techniques together with elementary group theory and projective geometry. It thus provides an exposition of the theory of finite generalized quadrangles which is as complete as possible while still being accessible to the graduate student. A number of new results are included and many proofs are considerably more streamlined than the original published version.

N. H. PAVEL. — **Differential equations, flow invariance and applications.** — Research notes in mathematics, vol. 113. — Un vol. broché, 17 × 24,5, de x, 246 p. — Prix: £13.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1984.

Preliminaries of nonlinear analysis. — Differential equations on closed subsets. Flow invariance. — Flow invariance with respect to second-order differential equations and applications to flight space. — Flow invariance on Banach manifolds and some optimization problems. — Perturbed differential equations on closed subsets.

Geometrical combinatorics. — Papers presented at a conference held at the Open University, Milton Keynes, U.K., on 9 March 1984. — Edited by F. C. Holroyd and R. J. Wilson. — Research notes in mathematics, vol. 114. — Un vol. broché, 17 × 24,5, de vi, 98 p. — Prix: £7.95. — Pitman advanced publishing program, 1984.

N. L. Biggs and J. Shawe-Taylor: Rotations and graphs with large girth. — *J. H. Mason:* An elementary proof of the theorem of the paper by N. L. Biggs and J. Shawe-Taylor. — *P. J. Cameron:* Infinite versions of some topics in finite geometry. — *J. I. Hall:* Symplectic geometry and mappings class groups. — *J. W. P. Hirschfeld:* Linear codes and algebraic curves. — *R. Penrose:* Pentaplexity: a class of non-periodic tilings of the plane. — *F. Piper and M. Walker:* Binary sequences and Hadamard designs. — *B. Grünbaum and G. C. Shephard:* The geometry of fabrics.

J. ENGELBRECHT. — **Nonlinear wave processes of deformation in solids.** — Monographs and studies in mathematics, vol. 16. — Un vol. relié, 16 × 24, de ix, 223 p. — Prix: £33.50. — Pitman advanced publishing program, Boston/London/Melbourne, 1984.

Nonlinear mathematical models of continuous media. — Preliminary analysis of wave propagation. — Ray method in theory of nonlinear waves. — One-dimensional waves in an elastic medium, and in viscoelastic and thermoelastic media. — One-dimensional waves in a dispersive medium, and in an inhomogeneous medium. — Two-dimensional waves. — Shock waves. — Applications.

Harald HANCHE-OLSEN, Erling STØRMER. — **Jordan operator algebras.** — Monographs and studies in mathematics, vol. 21. — Un vol. relié, 16 × 24, de viii, 183 p. — Prix: £27.50. — Pitman advanced publishing program, Boston/London/Melbourne, 1984.

This book serves as an introduction to Jordan algebras of operators on Hilbert spaces and their abstract counterparts. It aims to develop the theory of Jordan operator algebras to a point from which most of the theory of C^* and von Neumann algebras can be generalized to Jordan algebras on a natural way. Most of the material in this book has never before appeared in book form. The main exception to this is a chapter on the algebraic aspects of the theory. However, this treatment avoids all complications and abstractions not necessary for its purpose, making the chapter useful introduction to Jordan algebras even for the algebraist. The material in the other chapters existed prior to this book only in scattered research articles. *Contents*: Preliminaries in functional analysis. — Jordan algebras. — JB algebras. — JBW algebras. — Dimension theory. — Spin factors. — Structure theory.

H. ATTOUCH. — **Variational convergence for functions and operators.** — Applicable mathematics series. — Un vol. broché, $15,5 \times 24$, de xx, 423 p. — Prix: £19.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1984.

This book focuses attention on minimization problems and develops a convergence theory for sequences of functions, called epi-convergence, which may be regarded as the "weakest" notion which allows approach to the limit in the corresponding minimization problems. This concept of convergence thus has natural applications in all branches of optimization theory, from stochastic optimization, optimal control, numerical analysis and approximation to calculus of variations and perturbation problems in physics. — *Contents*: Epigraph-convergence, definition, examples. — Properties of epi-convergence. — Epi-convergence of convex functions. Duality, mosco-convergence and convergence of subdifferential operators.

Ismael HERRERA. — **Boundary methods: an algebraic theory.** — Applicable mathematics series. — Un vol. relié, $15,5 \times 24$, de viii, 136 p. — Prix: £16.50. — Pitman advanced publishing program, Boston/London/Melbourne, 1984.

Algebraic theory: Preliminary notions and notations. Formal adjoints and Green's formulas. Abstract characterization of Green's formulas. Regular subspaces and canonical decompositions. Green's formulas for operators defined in discontinuous fields. Illustrations of Green's formulas, and of jump operators. — *Boundary methods*: Scope. The subspace I_p . Immersion in a Hilbert space. Criterion of completeness. Solution of boundary value problems.

Intersection cohomology. — Edited by A. Borel et al. — Progress in mathematics, vol. 50. — Swiss seminars: a subseries of Progress in mathematics. — Un vol. relié, $15,5 \times 23$, de x, 238 p. — Prix: FS 48.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

A. Haefliger: Introduction to piecewise linear intersection homology. — *N. Habegger*: From PL to sheaf theory. — *M. Goresky and R. MacPherson*: A sample computation of intersection homology. — *N. A'Campo*: Pseudomanifold structures on complex analytic spaces. — *A. Borel*: Sheaf theoretic intersection cohomology. — *P. P. Grivel*: Les foncteurs de la catégorie des faisceaux associés à une application continue. — *M. Goresky*: Witt space cobordism theory (after P. Siegel). — *M. Goresky and R. MacPherson*: Lefschetz fixed point theorem and intersection homology. — *M. Goresky and R. MacPherson*: Problems and bibliography on intersection homology.

Séminaire de théorie des nombres, Paris, 1982-83. — Edited by Marie-José Bertin and Catherine Goldstein. — Progress in mathematics, vol. 51. — Un vol. relié, $15,5 \times 23$, de vi, 312 p. — Prix: FS 68.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

Continuing the outstanding tradition of the annual Séminaire de théorie des nombres, this volume contains a collection of papers based on lectures presented in 1982-83. The proceedings present a wide variety of topics with papers by an international group of mathematicians reporting the most important current research in all aspects of number theory. Contributors 1982-83 are: Y. Amice. — R. Berndt. — F. Beukers. — P. Cassou-Nogues. — H. Cohen. — G. Faltings. — E. Fouvry. — A. Fröhlich. — K.-I. Hashimoto. — A. Hildebrand. — T. Ibukiyama. — B. W. Jordan. — M. Langevin. — Wen-Ch'ing Winnie Li. — M. Mendes France. — J. F. Michon. — S. J. Patterson. — B. Perrin-Riou. — A. J. van der Poorten. — Imre Z. Ruzsa. — P. Schneider. — U. Stuhler.

Jacques GASQUI, Hubert GOLDSCHMIDT. — **Déformations infinitésimales des structures conformes plates.** — Progress in mathematics, vol. 52. — Un vol. relié, 15,5 × 23, de iv, 226 p. — Prix: FS 58.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

In this volume the authors construct an explicit geometric resolution of the sheaf of conformal Killing vector fields of a conformally flat Riemannian manifold; further, they study the self-adjointness of this resolution and deduce the duality properties of the cohomology with values in this sheaf. This construction is carried out within the framework of the Spencer-Goldschmidt theory of overdetermined systems of partial differential equations. In the context of the deformation theory developed by Kodaira and Spencer, it leads to many applications in the deformation theory or conformally flat structures, and provides one of the few concrete examples of these theories not related to complex manifolds. The appendix treats semisimple Lie algebras and duality theorems.

Topics in classical number theory. — Edited by G. Halasz. — Colloquia mathematica societatis Janos Bolyai, vol. 34. — 2 vol. reliés, 18 × 24,5, de 1662 p. au total. — Prix: Dfl. 425.00. — North-Holland publishing company, Amsterdam/Oxford/New York, 1984.

This volume contains more than 60 papers in various branches of number theory. Most of them are detailed versions of lectures presented at the Colloquium on number theory held in Budapest in 1981. The Colloquium, organized by the Janos Bolyai Mathematical Society in memory of Paul Turan, attracted about one hundred participants from 4 continents. Among the topics dealt with in this volume are the theory of Riemann's zeta-function, distribution of primes, sieve methods, exponential and Kloostermann sums, theory of additive and multiplicative functions, uniform distribution, combinatorial number theory, diophantine equations transcendental number theory, diophantine approximation, recursive sequences, theory of quadratic forms, as well as some areas of algebraic number theory.

Richard DURRETT. — **Brownian motion and martingales in analysis.** — Wadsworth mathematics series. — Un vol. relié, 17 × 24,5, de xi, 328 p. — Wadsworth advanced books and software, Belmont, 1984.

In the years that have passed since the pioneering work of Kakutani, Kac, and Doob, it has been shown that Brownian motion can be used to prove many results in classical analysis, primarily concerning the behavior of harmonic and analytic functions and the solutions of certain partial differential equations. In spite of the many pages that have been written on this subject, the results in this area are not widely known, primarily because they appear in articles that are scattered throughout the literature and are written

in a style appropriate for technical journals. The purpose of this book, then, is to bring some of these results together and to explain them as simply and as clearly as can be. *Contents*: Brownian motion. — Stochastic integration. — Conditioned Brownian motions. — Boundary limits of harmonic functions. — Complex Brownian motion and analytic functions. — Hardy spaces and related spaces of martingales. — H^1 and BMO , \mathcal{M}^1 and \mathcal{BMO} . — PDE's that can be solved by running a Brownian motion. — Stochastic differential equations. — A primer of probability theory.

Defect correction methods: theory and applications. — Edited by K. Böhmer and H. J. Stetter. — Computing supplementum, vol. 5. — Un vol. broché, 17 × 24,5, de ix, 242 p. — Springer-Verlag, Wien/New York, 1984.

K. Böhmer, P. W. Hemker and H. J. Stetter: The defect correction approach. — *R. Frank, J. Hertling and H. Lehner*: Defect correction algorithms for stiff ordinary differential equations. — *H.-J. Reinhardt*: On a principle of direct defect correction based on a-posteriori error estimates. — *F. Chatelin*: Simultaneous Newton's iteration for the Eigenproblem. — *J. Mandel*: On some two-level iterative methods. — *W. Hackbusch*: Local defect correction method and domain decomposition techniques. — *S. McCormick*: Fast adaptive composite grid (FAC) methods: theory for the variational case. — *P. W. Hemker*: Mixed defect correction iteration for the solution of a singular perturbation problem. — *S. Rump*: Solution of linear and nonlinear algebraic problems with sharp, guaranteed bounds. — *E. Kaucher and W. L. Miranker*: Residual correction and validation in functors. — *K. Böhmer, W. Gross, B. Schmitt and R. Schwarz*: Defect corrections and Hartree-Fock method. — *V. Pereyra*: Deferred corrections software and its application to seismic ray tracing. — *W. Schönauer, E. Schnepf and K. Raith*: Numerical engineering: experiences in designing PDE software with self-adaptive variable step size/variable order difference methods.

Gerald B. FOLLAND. — **Real analysis: modern techniques and their applications.** — Pure and applied mathematics. — Un vol. relié, 17 × 24,5, de xiv, 350 p. — Prix: £40.40. — John Wiley and sons, New York/Chichester/Brisbane/Toronto/Singapore, 1984.

In addition to presenting the standard classical material this comprehensive text emphasizes the ideas that have played significant roles in the development of real analysis and related areas during the past thirty years. Some of this material has heretofore been available only in more advanced or specialized monographs. Among the topics receiving special attention are: the n -dimensional Lebesgue integral, estimates and interpolation theorems for L^p spaces, convolutions and Fourier transforms, distributions and Sobolev spaces, Hausdorff measure. Over 460 exercises, varying in levels of difficulty, are provided in the text.

David BENSON. — **Modular representation theory: new trends and methods.** — Lecture notes in mathematics, vol. 1081. — Un vol. broché, 16,5 × 24,5, de xi, 231 p. — Prix: DM 31.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

The material covered in this book has remarkably little overlap with the material currently available in textbook form. The first of the book's two chapters provides the required background material from the theory of rings and modules, but the reader is expected to be familiar with much of this, and to refer to the rest as he needs it; proofs are included for the sake of completeness. The second chapter treats three main topics in detail: representation ring; almost split sequences and the Auslander-Reiten quiver; and complexity and cohomology varieties of modules. The book clearly illustrates the

close inter-connection between these 3 topics, and will thus serve to stimulate further investigation of their interplay.

Claus-Günther SCHMIDT. — **Arithmetik Abelscher Varietäten mit komplexer Multiplikation.** — Lecture notes in mathematics, vol. 1082. — Un vol. broché, $16,5 \times 24$, de x, 96 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Größencharaktere vom Typ A_0 . — Abelsche Varietäten mit komplexer Multiplikation. — Die Halbsysteme Abelscher CM -Typen. — Geometrische Annullator-Kriterien. — Modulikörper und unverzweigte Erweiterungen. — Die CM -Varietäten der Fermat-Jacobischen. — Diese Forschungsmonographie hat als Ausgangspunkt die Wechselwirkung zwischen der Arithmetik eines CM -Körpers und der Geometrie einer zugehörigen CM -Varietät. Diese Beziehung beruht wesentlich auf dem der CM -Varietät zugeordneten Größencharakter von Typ A_0 . Ein Ziel des Buches ist es, aufzuzeigen wie Stickerberger-Elemente beim Gebrauch von Abelschen Varietäten mit komplexer Multiplikation auftreten.

Daniel BUMP. — **Automorphic forms on $GL(3, \mathbf{R})$.** — Lecture notes in mathematics, vol. 1083. — Un vol. broché, $16,5 \times 24,5$, de xi, 184 p. — Prix: DM 26.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Automorphic forms on $GL(2)$. — The differential equations satisfied by Whittaker functions. — Jacquet's Whittaker functions. — Fourier expansions of automorphic forms. — Invariants of $G_\infty \backslash G$. — Ramanujan sums on $GL(3)$. — Eisenstein series. — The analytic continuation and functional equations satisfied by the L -series of an automorphic form. — Hecke operators and L -series. — The Mellin transforms of the Whittaker functions.

Dennis KLETZING. — **Structure and representations of Q -groups.** — Lecture notes in mathematics, vol. 1084. — Un vol. broché, $16,5 \times 24,5$, de vi, 290 p. — Prix: DM 38.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Q -groups are finite groups all of whose ordinary complex representations have rationally valued character: their structure and rational representations are the topic of this research monograph. Apart from a general introduction to the theory of Q -groups, the objective of the book is to establish for Q -groups a criterion for the property that all rationally represented characters are generalized permutation characters. Although there are non- Q -groups with this property, certain considerations stemming from algebraic geometry suggest that it holds for a large class of Q -groups. The theory of local characters provides a unified approach to this problem. The fundamental concept which then emerges is that of a locally split Q -group. The main result states that a Q -group which is everywhere locally split possesses the property referred to above. This unified approach is applied to the classical and exceptional Weyl groups as well as to several other families of Q -groups.

Geertrui K. IMMINK. — **Asymptotics of analytic difference equations.** — Lecture notes in mathematics, vol. 1085. — Un vol. broché, $16,5 \times 24,5$, de v, 134 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This book deals with systems of nonlinear analytic difference equations. The main results are existence theorems for holomorphic solutions of such equations, possessing

an asymptotic power series representation. Further, theorems on nonlinear equations are used to derive a general result on the analytic reduction of a homogeneous linear system to a canonical form. Particular attention is given to the role of Gevrey classes of holomorphic functions in the theory of difference equations; there appears to be a degree of analogy with results recently obtained by J. P. Ramis on differential equations. The approach chosen in this work is largely inspired by those methods in the theory of differential equations developed by Hukuhara, Malmquist, Sibuya, Wasow, Malgrange and for the Gevrey case, Ramis. The proofs are technical but do not require more than a basic knowledge of complex analysis. Some familiarity with asymptotic methods and perturbation theory is useful.

Sensitivity of functionals with applications to engineering sciences. — Proceedings of a special session of the American mathematical society Spring meeting held in New York city, May 1983. — Edited by V. Komkov. — Lecture notes in mathematics, vol. 1086. — Un vol. broché, 16,5 × 24,5, de v, 130 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

V. Komkov: Sensitivity analysis in engineering applications. More specifically, in civil and mechanical engineering applications. — *Jean W. Hou, Edward J. Haug and Robert L. Benedict*: Shape optimization of elastic bars in torsion. — *A. Diaz, N. Kikuchi and J. E. Taylor*: Optimal design formulations for finite element grid adaption. — *H. Rabitz*: Sensitivity methods for mathematical modelling. — *V. Komkov and C. Irwin*: Uniqueness for gradient methods in engineering optimization. — *P. Pedersen*: Sensitivity analysis for non-selfadjoint problems.

Wladyslaw NARKIEWICZ. — **Uniform distribution of sequences of integers in residue classes.** — Lecture notes in mathematics, vol. 1087. — Un vol. broché, 16,5 × 24,5, de viii, 125 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This monograph provides a survey of results relating to uniform distribution sequences of integers in residue classes, a topic which has been studied since the beginning of this century. The author starts from Dickson's classical theory of permutation polynomials and proceeds through general additive and multiplicative functions to particular functions like Ramanujan's τ -function and various divisor functions. The text abounds with problems and conjectures and will provide interesting reading and motivation for researchers and graduate students.

Differential geometry of submanifolds. — Proceedings of the conference held at Kyoto, January 23-25, 1984. — Edited by K. Kenmotsu. — Lecture notes in mathematics, vol. 1090. — Un vol. broché, 16,5 × 24,5, de vi, 132 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

A. Kasue: Estimates for solutions of Poisson equations and their applications to submanifolds. — *R. Miyaoka*: Taut embeddings and Dupin hypersurfaces. — *T. Adachi and T. Sunada*: Geometric bounds for the number of certain harmonic mappings. — *Y. Ohnita*: The first standard minimal immersions of compact irreducible symmetric spaces. — *S. Takakuwa*: A variational approach to the boundary value problem for hypersurfaces with prescribed mean curvature. — *T. Ohsawa*: Holomorphic embedding of compact S.P.C. manifolds into complex manifolds as real hypersurfaces. — *M. Koiso*: The stability and the Gauss map of minimal surfaces in R^3 . — *Y. Kitagawa*: Compact homogeneous submanifolds with parallel mean curvature. —

K. Watanabe: Sur les ensembles nodaux. — *K. Mashimo*: On some stable minimal cones in R^7 . — *H. Naitoh*: Symmetric submanifolds of compact symmetric spaces. — *K. Kenmotsu*: Gauss maps of surfaces with constant mean curvature.

Handbook of set-theoretic topology. — Edited by Kenneth Kunen and Jerry E. Vaughan. — Un vol. relié, 17×25 , de vi, 1260 p. — Prix: Dfl. 275.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

This handbook is designed as an introduction to recent work in set-theoretic topology. It is intended both for students who plan to enter the fields and for researchers in other areas for whom results in set-theoretic topology may be relevant. The aim of the editors has been to make the Handbook as self-contained as possible without repeating material which can easily be found in standard texts. The articles are quite varied in their degree of difficulty. Many of them can be read with only a basic knowledge of set theory and general topology. In general, the articles may be read in any order, except that in few cases, they occur in pairs, with the first one giving an elementary treatment of a subject and the second one giving more advanced results. It is intended that the Handbook be usable either as a text or a reference; to this end, the articles contain many detailed proofs of core results, as well as references to the literature for peripheral results for which space seemed insufficient to include all details. The articles also state many open problems of current interest. The Handbook should provide a stimulus for future research. — *Contents*: *R. Hodel*: Cardinal functions I. — *I. Juhász*: Cardinal functions II. — *E. K. van Douwen*: The integers and topology. — *S. W. Williams*: Box products. — *A. W. Miller*: Special subsets of the real line. — *S. Todorčević*: Trees and linearly ordered sets. — *J. Roitman*: Basic S and L . — *U. Abraham*: Martin's axiom and first-countable S - and L -spaces (with *S. Todorčević*). — *D. K. Burke*: Covering properties. — *G. Gruenhage*: Generalized metric spaces. — *Jan van Mill*: An introduction to $\beta\omega$. — *J. E. Vaughan*: Countably compact and sequentially compact spaces. — *R. M. Stephenson, Jr.*: Initially k -compact and related spaces. — *P. Nyikos*: The theory of nonmetrizable manifolds. — *F. D. Tall*: Normality versus collectionwise normality. — *W. G. Fleissner*: The normal Moore space conjecture and large cardinals. — *M. E. Rudin*: Dowker spaces. — *T. C. Przymusiński*: Products of normal spaces. — *W. Weiss*: Versions of Martin's axiom. — *Kenneth Kunen*: Random and Cohen reals. — *J. E. Baumgartner*: Applications of the proper forcing axiom. — *R. J. Gardner and W. F. Pfeffer*: Borel measures. — *S. Negrepontis*: Banach spaces and topology. — *W. W. Comfort*: Topological groups.

Ralph ABRAHAM, Jerrold E. MARSDEN, Tudor RATIU. — **Manifolds, tensor analysis, and applications.** — Global analysis: pure and applied, vol. 2, sub-series B: basic, advanced undergraduate level and beginning graduate texts. — Un vol. relié, 17×24 , de xix, 582 p. — Addison-Wesley publishing company, Inc., Reading, Mass./London/Amsterdam/Don Mills/Sydney, Tokyo, 1983.

This text provides core background material in global analysis and a working knowledge of manifolds, dynamical systems, tensors, and differential forms. Applications to mechanics, control theory, and electromagnetism are given. Special topics occur in boxes throughout the text which enables the reader to skip various topics without disturbing the main flow of the text. — *Contents*: Topology. — Banach spaces and differential calculus. — Manifolds and vector bundles. — Vector fields and dynamical systems. — Tensors. — Differential forms. — Integration on manifolds. — Applications. — Appendices.

Eiichi BANNAL, Tatsuro ITO. — **Algebraic combinatorics I: association schemes.** — Mathematics lecture note series, vol. 58. — Un vol. relié, 17 × 24, de xxiv, 425 p. — The Benjamin/Cummings publishing company, Inc., Menlo Park, California/London/Amsterdam/Don Mills, Ontario/Sydney/Tokyo, 1984.

The purpose of these lecture notes is to give a systematic account of algebraic combinatorics. Here the authors mean by algebraic combinatorics the approach to combinatorics which was formulated in Delsarte's monumental thesis in 1973, enabling us to look at a wide range of combinatorial problems from a unified viewpoint. It is in Delsarte's thesis that algebraic combinatorics is recognized as what unifies the individual approaches which are named, in each branch, algebraic graph theory, algebraic coding theory, algebraic design theory, the method of Schur rings, the method of intersection matrices in permutation group theory..., etc. — *Contents*: Representations of finite groups. — Association schemes. — Distance-regular graphs and (P and Q)-polynomial association schemes.

James R. MUNKRES. — **Elements of algebraic topology.** — Un vol. relié, 17 × 24, de ix, 454 p. — Addison-Wesley publishing company, Menlo Park, California/Reading, Mass./London/Amsterdam/Don Mills, Ontario/Sydney, 1984.

This title is an introduction to the classical results and methods of homology theory. The book's logical sequence of topics and flexible organization make it adaptable to a number of different courses. The book begins with a treatment of the simplicial homology groups, the most concrete of the homology theories. After a proof of their topological invariance and verification of the Eilenberg Steenrod axioms, the singular homology groups are introduced as their natural generalization. CW complexes appear as a useful computational tool, and the basic core material is rounded out with a treatment of cohomology groups and the cohomology ring. Two additional chapters deal with homological algebra and duality in manifolds. Geometric motivation and applications are stressed throughout, and exercises, varying from routine to challenging, follow each section.

Neal KOBLITZ. — **Introduction to elliptic curves and modular forms.** — Graduate texts in mathematics, vol. 97. — Un vol. relié, 16 × 24, de viii, 248 p. — Prix: DM 112.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This text covers the basic properties of elliptic curves and modular forms, with emphasis on certain connections with number theory. The ancient "congruent number problem" is the central motivating example for most of the book. The author's exposition makes the subject accessible to those who find it hard to read more advanced or more algebraically oriented treatments. Nevertheless, the book introduces several topics which are at the forefront of current research. Down-to-earth examples are given in the text and exercises with the aim of making the material readable and interesting to mathematicians far removed from the subject of the book. — *Contents*: From congruent numbers to elliptic curves. — The Hasse-Weil L -function of an elliptic curve. — Modular forms. — Modular forms of half integer weight. — Answers, hints, and references for selected exercises.

Stochastic analysis and applications. — Edited by Mark A. Pinsky. — Advances in probability and related topics, vol. 7. — Un vol. relié, 16 × 23,5, de x, 460 p. — Prix: FS 157.00. — Marcel Dekker, Inc., New York/Basel, 1984.

S. Albeverio, R. Hoegh-Krohn: Diffusion fields, quantum fields, and fields with values in Lie groups. — *A. Bensoussan, J. L. Menaldi*: Optimal stochastic control of diffusion processes with jumps stopped at the exit of a domain. — *J. Franke*: Necessary conditions on optimal Markov controls for stochastic processes. — *M. I. Freidlin*: On wavefront propagation in periodic media. — *M. Hitsuda*: Wiener-like integrals for Gaussian processes and the linear estimation problem. — *N. Ikeda and S. Watanabe*: Stochastic flows of diffeomorphisms. — *J. Jacod*: Differentiability in measure for stochastic differential equations. — *G. Kallianpur, C. Bromley*: Generalized Feynman integrals using analytic continuation in several complex variables. — *H. Kunita*: Stochastic differential equations and stochastic flows of homeomorphisms. — *H. J. Kushner*: Approximation of processes and applications to control and communication theory. — *M. Motoo*: An analog to the stochastic integral. — *K. Nishioka*: A complex measure related to the Schrödinger equation. — *Y. Ogura*: On the nearness of two solutions in comparison theorems for one-dimensional stochastic differential equations. — *S. Omatu*: Estimation theory in Hilbert spaces and its applications. — *H. Tanaka*: Homogenization of diffusion processes with boundary conditions. — *Hisao Watanabe*: Diffusion approximation of some stochastic difference equations.

D. P. PARENT (a pseudonym for D. Barsky, F. Bertrandias, G. Christol... et al.). — **Exercises in number theory.** — Problem books in mathematics. — Un vol. relié, 16 × 24, de x, 539 p. — Prix: DM 135.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This is a sophisticated collection of problems in number theory, introducing students to many questions that are central to an understanding of the development of the subject and current research. A comprehensive 1st chapter, concentrating on sieve methods, is particularly useful. The collection contains ten chapters, arranged by topic, consisting of short introductions with definitions, the problems themselves, and lengthy, well explained solutions. *Contents*: Prime numbers: arithmetic functions: Selberg's sieve. — Additive theory. — Rational series. — Algebraic theory. — Distribution modulo 1. — Transcendental numbers. — Congruences mod p : modular forms. — Quadratic forms. — Continued fractions. — p -adic analysis. — Bibliography.

Time series analysis of irregularly observed data: proceedings, College station, 1983. — Ed. by Emanuel Parzen. — Lecture notes in statistics, vol. 25. — Un vol. broché, 16,5 × 24, de vii, 363 p. — Prix: DM 58.00. — Springer-Verlag, Berlin/Heidelberg/Tokyo, 1984.

The analysis of irregularly observed time series (or time series with missing data) is one of the most important problems faced by applied researchers whose data arise in the form of time series (or processes). The papers included in this volume provide a comprehensive review of the approaches that time series analysts are taking to infer the properties of a complete time series from irregularly observed values. The papers in this book also provide introductions to the diversity of modern approaches to the analysis and modelling of time series as well as the extension of these methods to missing data or irregularly observed values.

David POLLARD. — **Convergence of stochastic processes.** — Springer series in statistics. — Un vol. relié, 16 × 24, de xiv, 215 p. — Prix: DM 82.00. — Springer-Verlag/New York/Berlin/Heidelberg/Tokyo, 1984.

This is an exposition of selected topics from the theory of empirical processes, with

related information about weak convergence and applications of mathematical statistics. A central topic of the book is the investigation of maximal inequalities for empirical processes indexed by classes of sets or classes of functions. Other interesting subjects are questions of convergence for measures that do not live on Borel σ -fields and finite dimensional approximation as the unifying idea behind weak convergence.

Myles HOLLANDER, Frank PROSCHAN. — **The statistical exorcist: dispelling statistics anxiety.** — Popular statistics. — Un vol. relié, 16 × 23,5, de xi, 247 p. — Prix: FS 49.00. — Marcel Dekker, New York/Basel, 1984.

Statistics is used in hundreds of ways in everyday life. The *Statistical exorcist* provides you with clear, effective approaches to intelligent decision-making, sampling, analyzing data, and estimating probabilities. This easy-to-read text, highlighted with interesting anecdotes, cartoons, quotations, and problems provides you with the essential analytical and problem-solving skills that make statistics very simple.

T. Subba RAO, M. M. GABR. — **An introduction to bispectral analysis and bilinear time series models.** — Lecture notes in statistics, vol. 24. — Un vol. broché, 16,5 × 24, de viii, 280 p. — Prix: DM 43.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

A nonlinear model, known as a bilinear model, has recently been introduced in time series literature. The author's objective is to show how this bilinear model should be considered in statistical theory. The forecasting aspects of this model are also considered and the methods are illustrated with real data. The importance of higher order moments (and spectra) for studying the departure from Gaussianity and linearity of the series is pointed out and tests developed are illustrated with examples.

Diane Griffin SAPHIRE. — **Estimation of victimization prevalence using data from the national crime survey.** — Lecture notes in statistics, vol. 23. — Un vol. broché, 16,5 × 24, de v, 165 p. — Prix: DM 29.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This book explains the use of data collected in the National crime survey, which is conducted by the Bureau of the census to collect victimization data. This data is used to estimate the probability that a housing unit will be crime-free during a certain year. The question is decided through longitudinal analyses and use of the superpopulation model approach rather than the usual finite population approach. The effect on nonresponse is also studied in detail.

Søren JOHANSEN. — **Functional relations, random coefficients, and nonlinear regression with application to kinetic data.** — Lecture notes in statistics, vol. 22. — Un vol. broché, 16,5 × 24, de viii, 126 p. — Prix: DM 34.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

Presented here, the reader will find the theory of some non-standard but classical techniques in regression which the author finds useful when analyzing kinetic data. The book contains a mathematical statistical treatment of some simple models in weighted regression, functional relations, random coefficients and non-linear regression.

I. M. JAMES. — **General topology and homotopy theory.** — Un vol. relié, 16 × 24, de vii, 248 p. — Prix: DM 108.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This book is a comprehensive and detailed account of all of the elements of point set topology that are useful and needed in algebraic topology. This, and the author's desire to give complete proofs for his results make the book unique and extremely useful to the students as well as to the specialist. *Contents*: The basic framework. — The axioms of topology. — Spaces under and spaces over. — Topological transformations groups. — The notion of homotopy. — Cofibrations and fibrations. — Numerable coverings. — Extensors and neighbourhood extensors.

Marcel BERGER, Pierre PANSU, Jean-Pic BERRY, Xavier SAINT-RAYMOND. — **Problems in geometry**. — Translated by Silvio Levy. — Problem books in mathematics series. — Un volume relié, 16×24 , de VIII, 266 p. — Prix; DM 94.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This is a collection of original problems, most of them chosen from the book "Geometry" by Marcel Berger. The first part of the book contains summaries of the notions necessary to handle the problems; a second section contains hints, and the last section contains detailed solutions. The problems cover a very large scope of geometry, starting from tilings, through euclidean, spherical, hyperbolic, and projective geometries to triangles, circles and spheres, convex bodies and polygons, polyhedrons, and finally conic sections and quadrics.

K. W. CHANG, F. A. HOWES. — **Nonlinear singular perturbation phenomena: theory and applications**. — Applied mathematical sciences, vol. 56. — Un vol. broché, $15,5 \times 23,5$, de VIII, 180 p. — Prix: DM 58.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This monograph is devoted to the study of several types of boundary value problems for singularly perturbed second-order scalar and vector differential equations. In this book, the authors provide a fairly complete theory for the occurrence of various asymptotic phenomena and illustrate this theory with a number of examples and model problems drawn from applications. The unifying theme is that of the consistent use of differential inequality techniques coupled with geometric and asymptotic concepts. The results presented are the most complete for the class of problems considered; more importantly, together with the author's techniques, they indicate further directions of study which will be actively pursued by workers in many asymptotic disciplines.

R. D. DRIVER. — **Why math?** — Undergraduate texts in mathematics. — Un vol. relié, $16,5 \times 24$, de XIV, 233 p. — Prix: DM 69.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This book is designed for a general education mathematics course. It helps develop the basic mathematical literacy now demanded of liberal arts students by many colleges and universities. The emphasis is on quantitative reasoning and critical analysis of real life problems. — *Contents*: Arithmetic review. — Prime numbers and fractions. — The Pythagorean theorem and square roots. — Elementary equations. — Quadratic polynomials and equations. — Powers and geometric sequences. — Areas and volumes. — Galilean relativity. — Special relativity. — Binary arithmetic. — Sets and counting. — Probability. — Cardinality.

Murray H. PROTTER, Hans F. WEINBERGER. — **Maximum principles in differential equations**. — Corrected reprint. — Originally published by Prentice-Hall, 1967. — Un

vol. relié, 16×24 , de x, 261 p. — Prix: DM 79.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

Stressing numerical approximations that find ready application in physics, chemistry, engineering and economics as well as in the study of mathematics, this book guides the reader from the simplest one-dimensional maximum principle discussion through the more sophisticated equations and their operations. Though much additional work was done since the book was first published, this title is still a valuable introduction to the field and a source of the most basic and useful techniques.

Larry SMITH. — **Linear algebra.** — 2nd ed. — Undergraduate texts in mathematics. — Un vol. relié, 16×24 , de vii, 362 p. — Prix: DM 88.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This 2nd edition of a well established textbook now contains two new chapters on Jordan's normal form as well as numerous added exercises (increased to a minimum of 25 per chapter). These changes do not affect the character of the book as a compact but mathematically clean introduction to linear algebra with particular emphasis on topics that are used in the theory of differential equations.

Tosio KATO. — **Perturbation theory for linear operators.** — 2nd corrected printing of the 2nd edition. — Grundlehren der mathematischen Wissenschaften, vol. 132. — Un vol. relié, 16×24 , de xxi, 619 p. — Prix: DM 128.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Operator theory in finite-dimensional vector spaces. — Perturbation theory in a finite-dimensional space. — Introduction to the theory of operators in Banach spaces. — Stability theorems. — Operators in Hilbert spaces. — Sesquilinear forms in Hilbert spaces and associated operators. — Analytic perturbation theory. — Asymptotic perturbation theory. — Perturbation theory for semigroups of operators. — Perturbation of continuous spectra and unitary equivalence.

Seminar on nonlinear partial differential equations. — Edited by S. S. Chern. — Mathematical sciences research institute publications, vol. 2. — Un vol. relié, 16×24 , de viii, 373 p. — Prix: DM 94.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

S. S. Antman: Geometrical and analytical questions in nonlinear elasticity. — A. J. Chorin: An introduction to Euler's equations for an incompressible fluid. — P. Griffiths: Linearizing flows and a cohomology interpretation of Lax equations. — R. Hamilton: The Ricci curvature equation. — F. John: A walk through partial differential equations. — T. Kato: Remarks on zero viscosity limit for nonstationary Navier-Stokes flows with boundary. — J. B. Keller: Free boundary problems in mechanics. — R. V. Kohn: The method of partial regularity as applied to the Navier-Stokes equations. — P. D. Lax: Shock waves, increase of entropy and loss of information. — J. E. Marsden: Stress and Riemannian metrics in nonlinear elasticity. — Richard Melrose: The Cauchy problem and propagation of singularities. — J. Neu: Analytical theories of vortex motion. — R. Osserman: The minimal surface equation. — J. C. Polking: A survey of removable singularities. — M. H. Protter: Applications of the maximum principle. — P. H. Rabinowitz: Minimax methods and their application to partial differential equations. — R. M. Schoen: Analytic aspects of the harmonic map problem. — A. Weinstein: Equations of plasma physics.

B. MALGRANGE. — **Lectures on the theory of functions of several complex variables.** — Notes by Raghavan Narasimhan. — Reprint. — Un vol. broché, $17,5 \times 24$, de iii, 132 p. — Prix : DM 20.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Domains of holomorphy: Cauchy's formula and elementary consequences. Reinhardt domains and circular domains. Complex analytic manifolds. Analytic continuation. Envelopes of holomorphy. Domains of holomorphy: convexity theory. Convexity theory. — *Differential properties of the cube*: d'' -cohomology on the cube. Holomorphic regular matrices. Complementary results. — *Coherent analytic sheaves*: Sheaves. General properties of coherent analytic sheaves. Cohomology with coefficients in a sheaf. Coherent analytic sheaves on a cube. Stein manifolds: preliminary results. Coherent analytic sheaves on a Stein manifold.

Yves LAURENT. — **Théorie de la deuxième microlocalisation dans le domaine complexe.** — Progress in mathematics, vol. 53. — Un vol. relié, 15×23 , de xvi, 311 p. — Prix : FS 68.00. — Birkhäuser, Boston/Basel/Stuttgart, 1985.

This volume presents the theory of the 2nd micro-localization in the complex field. This theory is useful in studying a system of partial differential equations in the neighborhood of a lagrangian or involutive submanifold of the cotangent bundle (phase space). The last part of the work deals with the Cauchy problem for ramified holomorphic functions, the growth of the formal power series solutions of a system of partial differential equations, and other related problems. — *Contents*: 2-microfonctions holomorphes. — Opérateur 2-microdifférentiels. — Application à l'étude des systèmes d'équations différentielles et microdifférentielles.

Spectral theory of linear operators and related topics. — 8th International conference on operator theory, Timisoara and Herculane (Romania), June 6-16, 1983. — Edited by H. Helson, B. Sz.-Nagy, F.-H. Vasilescu, D. Voiculescu. — Managing editor: Gr. Arsene. — Operator theory: advances and applications, vol. 14. — Un vol. relié, 17×24 , de 306 p. — Prix : FS 68.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

This book comprises carefully selected papers on theory of linear operators and related fields. Presented are original results of new research in fast developing areas. The papers mostly focus on different aspects of spectral theory of linear operators. Abstract classes of operators are analysed as well as concrete classes of differential integral, singular integral and pseudodifferential operators.

Robert J. ZIMMER. — **Ergodic theory and semisimple groups.** — Monographs in mathematics, vol. 81. — Un vol. relié, 17×24 , de x, 209 p. — Prix : FS 78.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

This volume provides a complete and accessible treatment of Margulis's work on rigidity, arithmeticity, and normal subgroups of lattices in semisimple groups, as well as related work on the actions of semisimple groups and their discrete subgroups. Basic connections between ergodic theory, representation theory, and algebraic groups are developed in detail. This exposition serves as an introduction to ergodic theory of general group actions and some topics in representation theory, representations of semi-direct products, matrix coefficients for semisimple groups, and Kazhdan's property T . — *Contents*: Introduction. — Moore's ergodicity theorem. — Algebraic groups and measure theory. — Amenability. — Rigidity. — Margulis' arithmeticity theorems. — Kazhdan's property (T). — Normal subgroups of lattices. — Further results on ergodic actions. —

Generalizations to p -adic groups and S -arithmetic groups. — Appendices: Borel spaces. Almost everywhere identities on groups.

V. I. ARNOLD, S. M. GUSEIN-ZADE and A. N. VARCHENKO. — **Singularities of differentiable maps.** — Vol. 1: the classification of critical points, caustics and wave fronts. — Under the editorship of V. I. Arnold, translated by Ian Porteous, based on a previous translation by Mark Reynolds. — Monographs in mathematics, vol. 82. — Un vol. relié, 17,5 × 24, de x, 382 p. — Prix: FS 98.00. — Birkhäuser, Boston/Basel/Stuttgart, 1985.

Basic concepts: The simplest examples. The classes Σ^1 . The quadratic differential of a map. The local algebra of a map and Weierstrass preparation theorem. The local multiplicity of a holomorphic map. Stability and infinitesimal stability. The proof of the stability theorem. Versal deformations. The classification of stable germs by genotype. Review of further results. — *Critical points of smooth functions:* A start to the classification of critical points. Quasihomogeneous and semiquasihomogeneous singularities. The classification of quasihomogeneous functions. Spectral sequences for the reduction to normal forms. Lists of singularities. The determinant of singularities. Real, symmetric and boundary singularities. — *Singularities of caustics and wave fronts:* Lagrangian singularities. Generating families. Legendrian singularities. The classification of Lagrangian and Legendrian singularities. The bifurcation of caustics and wave fronts.

W. H. SCHIKHOF. — **Ultrametric calculus: an introduction to p -adic analysis.** — Cambridge studies in advanced mathematics; vol. 4. — Un vol. relié, 16 × 23,5, de xi, 306 p. — Prix: £25.00. — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

This is an introduction to p -adic analysis which is elementary yet complete and which displays the variety of applications of the subject. The author's presentation parallels a standard course in advanced analysis, so he is able to point out and explain how p -adic and "real" analysis differ. This approach guarantees the reader quickly becomes acquainted with this equally "real" analysis and appreciates its relevance. The reader's understanding is enhanced and deepened by the large number of exercises included throughout: these both test the reader's grasp and extend the text in interesting directions. *Contents:* Valuations. — Ultrametries. — Elementary calculus. — Interpolation. — Analytic functions. — Mahler's base and p -adic integration. — The p -adic gamma and zeta functions. — Van der Put's base and antiderivation. — Continuity and differentiability. — C^n -theory. — Monotone functions. — Aspects of functional analysis.

The Smith conjecture. — Edited by John W. Morgan and Hyman Bass. — Pure and applied mathematics, vol. 112. — Un vol. relié, 16 × 23,5, de xv, 243 p. — Prix: \$49.50. — Academic press, Orlando/San Diego/San Francisco/New York/London/Toronto/Montreal/Sydney/Tokyo/Sao Paulo.

John W. Morgan: The Smith conjecture. — *John W. Morgan:* History of the Smith conjecture and early progress. — *John W. Morgan:* An outline of the proof. — *Peter B. Shalen:* The proof in the case of no incompressible surface. — *John W. Morgan:* On Thurston's uniformization theorem for three-dimensional manifolds. — *Hyman Bass:* Finitely generated subgroups of GL_2 . — *C. McA. Gordon and R. A. Litherland:* Incompressible surfaces in branched coverings. — *Shing-Tung Yau and William H. Meeks, III:* The equivariant loop theorem for three-dimensional manifolds and a review of the existence theorems for minimal surfaces. Group actions on R^3 . — *Michael W. Davis and John W. Morgan:* Finite group actions on homotopy 3-spheres. — *Michael W. Davis:* A survey of results in higher dimensions.

Incomplete data in sample surveys, volume 1: report and case studies. — National research council, Panel on incomplete data. — Edited by William G. Madow, Harold Nisselson, Ingram Olkin. — Un vol. relié, 16 × 23,5, de xxiii, 495 p. — Prix: \$50.00. — Academic press, New York/London/Paris/San Diego/San Francisco/Sao Paulo/Sydney/Tokyo/Toronto, 1983.

REPORT: Introduction and recommendations. — Problems of incomplete data. — Measuring and reporting nonresponse. — Review of case studies. — Review of theory. — CASE STUDIES: *Harold Nisselson*: Overview. — *Barbara A. Boyes and Margaret E. Conlon*: The employment cost index: a case study of incomplete data. — *Robert L. Freie*: USDA livestock inventory surveys. — *Charlotte G. Steeh, Robert M. Groves, Robert Comment, Evelyn Hansmire*: Report on the Survey research center's surveys of consumer attitudes. — *Richard Valliant, Richard Tomasino, Morris H. Hansen*: Treatment of missing data in an office equipment survey. — *William G. Madow*: Annual survey of manufactures. — *Rodger Turner and Murray Lawes*: Incomplete data in the survey of consumer. — *M. Haseeb Rizvi*: An empirical investigation of some item nonresponse adjustment procedures. — *William G. Madow*: Readership of ten major magazines. — *Martha J. Banks, Ronald Andersen, Martin R. Frankel*: Total survey error. — *David W. Chapman*: An investigation of nonresponse imputation procedures for the health and nutrition examination survey.

Incomplete data in sample surveys, volume 2: theory and bibliographies. — National research council, Panel on incomplete data. — Edited by William G. Madow, Ingram Olkin, Donald B. Rubin. — Un vol. relié, 16 × 23,5, de xxv, 579 p. — Prix: \$50.00. — Academic press, New York/London/Paris/San Diego/San Francisco/Sao Paulo/Sydney/Tokyo/Toronto, 1983.

A. P. Dempster, D. B. Rubin: Introduction. — *W. G. Cochran*: Historical perspective. — SELECTED TOPICS IN DATA COLLECTION: *J. H. Sedransk*: Introduction. — *P. S. R. S. Rao*: Callbacks, follow-ups, and repeated telephone calls. — *D. W. Chapman*: The impact of substitution on survey estimates. — *B. F. King*: Quota sampling. — *L. Emrich*: Randomized response techniques. — *M. G. Sirken*: Handling missing data by network sampling. — NONRESPONSE AND DOUBLE SAMPLING: *W. G. Madow, B. Singh*: Introduction. — *P. S. R. S. Rao*: Randomization approach. — *B. Singh*: Bayesian approach. — WEIGHTING AND IMPUTATION METHODS: *D. B. Rubin*: Conceptual issues in the presence of nonresponse. — *H.-L. Oh, F. J. Scheuren*: Weighting adjustment for unit nonresponse. — *B. L. Ford*: An overview of hot-deck procedures. — *T. N. Herzog, D. B. Rubin*: Using multiple imputations to handle nonresponse in sample surveys. — IMPUTATION METHODOLOGY: TOTAL SURVEY ERROR: *R. Platek, G. B. Gray*: Introduction. Imputation methodology. Hypothetical example with imputation procedures. Appendixes. — SUPER-POPULATION MODELS FOR NONRESPONSE: *R. J. A. Little*: Introduction. The ignorable case. The nonignorable case. — BIBLIOGRAPHIES: *L. V. Hedges, I. Olkin*: Selected annotated bibliography. — *B. Bogeström, M. Larsson, L. Lyberg*: Bibliography on nonresponse and related topics.

Incomplete data in sample surveys, volume 3: proceedings of the symposium. — National research council, Panel on incomplete data. — Edited by William G. Madow, Ingram Olkin. — Un vol. relié, 16 × 23,5, de xxvi, 413 p. — Prix: \$50.00. — Academic press, New York/London/Paris/San Diego/San Francisco/Sao Paulo/Sydney/Tokyo/Toronto, 1983.

M. N. Murthy: A framework for studying incomplete data, with a reference to the experience in some countries of Asia and the Pacific. — *I. Thomsen, E. Siring*:

On the causes and effects of nonresponse: Norwegian experiences. — *L. R. Frankel, S. Dutka*: Survey design in anticipation of nonresponse and imputation. — *T. Dalenius*: Informed consent or R.S.V.P. — *R. R. Hocking*: The design and analysis of sample surveys with incomplete data: reduction of respondent burden. — *W. L. Schaible*: Estimation of finite population totals from incomplete sample data: prediction approach. — *C. M. Cassel, C.-E. Särndal, J. H. Wretman*: Some uses of statistical models in connection with the non-response problem. — *M. A. Woodbury*: Statistical record matching for files. — *V. Hasselblad, J. P. Creason, A. G. Stead*: Applications of the missing-information principle. — *J. N. K. Rao, E. Hughes*: Comparison of domains in the presence of nonresponse. — *B. Singh, J. H. Sedransk*: Bayesian procedures for survey design when there is nonresponse. — *J. T. Lessler*: An expanded survey error model. — *R. G. Jones*: An examination of methods of adjusting for nonresponse to a mail survey: a mail-interview comparison. — *B. A. Bailer, J. C. Bailer, III*: Comparison of the biases of the hot-deck imputation procedure with an "equal-weights" imputation procedure. — *C. N. Morris*: Nonresponse issues in public policy experiments, with emphasis on the health insurance study. — *G. T. Sande*: Replacement for a ten-minute gap. — *I. G. Sande*: Hot-deck imputation procedures. — *M. H. Rizvi*: Hot-deck procedures: introduction. — *W. G. Madow*: Inference: introduction. — *K. R. W. Brewer, C.-E. Särndal*: Six approaches to enumerative survey sampling. — *D. Basu*: A discussion of survey theory. — *T. Dalenius*: Some reflections on the problem of missing data.

Alexander OSTROWSKI. — **Collected mathematical papers, vol. 5: Complex function theory.** — Un vol. relié, 17,5 × 24, de 544 p. — Prix: FS 79.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

Professor Ostrowski is one of the last great mathematicians to command a comprehensive knowledge of mathematical science while also having worked and published in virtually all its branches: algebra, number theory, function theory, real analysis, linear algebra, numerical analysis, complexity theory. To have Ostrowski papers, including many earlier works no longer readily accessible, united in six comprehensive volumes, will be of inestimable importance to contemporary researchers.

Matthias KLÄY, Hans RIEDWYL. — **ALSTAT 1: Algorithmen der Statistik für Kleinrechner.** — Programm Praxis, Bd. 1. — Un vol. broché, 15 × 21, de 248 p. — Prix: FS 36.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

ALSTAT 1 ist ein neuartiges Konzept, um Algorithmen der Statistik auf Kleinrechnern (Taschenrechner, Home-Computer) einfach und in flexibler, massgeschneiderter Weise zu programmieren und anzuwenden. Mit einem einfachen Kernprogramm werden die (fast) allen statistischen Methoden zugrunde liegenden Grössen berechnet und anschliessend je nach individuellem Bedarf weiterverarbeitet.

Matthias KLÄY, Hans RIEDWYL. — **ALSTAT 2: Algorithmen der Statistik für Hewlett-Packard HP-41C.** — Programm Praxis, Bd. 2. — Un vol. broché, 15 × 21, de 171 p. — Prix: FS 30.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

ALSTAT 2 ist ein vollständig ausgearbeitetes Programmsystem für einen Hewlett-Packard HP-41 Rechner, um Methoden der Statistik anzuwenden. Es ist besonders darauf ausgerichtet, dem Benützer einfache und massgeschneiderte Lösungen seiner Statistikprobleme zu liefern. ALSTAT 2 stützt sich massgeblich auf das im Band ALSTAT 1 dargestellte neue Konzept zur Programmierung statistischer Algorithmen. ALSTAT 2 ist ohne den Methodenband ALSTAT 1 nicht mit Gewinn einzusetzen.

P. G. CIARLET. — **Lectures on three-dimensional elasticity.** — Lectures delivered at the Indian institute of science, Bangalore. — Tata institute of fundamental research lectures on mathematics, vol. 71. — Un vol. broché, 18×24 , de v, 149 p. — Prix: DM 20.00. — Narosa publishing house, New Delhi, distributed by Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

Description of three-dimensional elasticity: Geometrical preliminaries. Equilibrium equations. Constitutive equations. Hyperelasticity. — *Some mathematical aspects of three-dimensional elasticity:* General considerations about the boundary value. Problems of three-dimensional elasticity. The linearized system of elasticity. Existence theorems via the implicit function theorem. Convergence of semi-discrete incremental methods. An existence theorem for minimizing functionals and outline of its application to non-linear elasticity. J. Ball's polyconvexity and existence theorems in three-dimensional elasticity. Bibliography, comments and some open problems.

Bernard R. McDONALD. — **Linear algebra over commutative rings.** — Monographs and textbooks in pure and applied mathematics, vol. 87. — Un vol. relié, $16 \times 23,5$, de 560 p. — Prix: FS 185.00. — Marcel Dekker, Inc., New York/Basel, 1984.

This book provides an ideal, comprehensive introduction to — and an up-to-date survey of — matrix theory, linear algebra, and projective modules and their endomorphisms over commutative rings. Packed with extensive exercise sets that examine the theory for specific commutative rings, domains, or fields, this book serves as both an important reference and text for mathematical researchers, advanced undergraduate and graduate students.

Makoto NAMBA. — **Geometry of projective algebraic curves.** — Monographs and textbooks in pure and applied mathematics, vol. 88. — Un vol. relié, $16 \times 23,5$, de 432 p. — Prix: FS 195.00. — Marcel Dekker, Inc., New York/Basel, 1984.

Ranging from classical geometry of conics to results of present-day research, this book encompasses geometric, algebraic, and function theoretic methods while avoiding such highly developed tools as cohomology; works with a complex number field instead of an abstract field, to promote a more concrete understanding; introduces new, unpublished results on linear systems; discusses and classifies singular plane curves of low degree..., etc. Complete with end-of-chapter exercises and more than 300 illustrations for superior clarity, this book is interesting for all mathematicians working in this field.

Winfried SCHARLAU. — **Quadratic and Hermitian forms.** — Grundlehren der mathematischen Wissenschaften, vol. 270. — Un vol. relié, $16,5 \times 24$, de x, 421 p. — Prix: DM 138.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

This Grundlehren volume presents in coherent form the most important results and methods in the algebraic theory of quadratic forms over arbitrary fields; most of these results have been discovered only during the past 20 years. Number theoretical topics are treated insofar as the algebraic theory has led to new aspects. A main theme is the structure theory and the computation of various kinds of Witt rings and Witt groups. The foundation of the theory of quadratic and hermitian forms in arbitrary additive categories, the theory of involutions on simple algebras, and the classification of hermitian forms over algebraic number fields are treated in book form for the first time. This comprehensive and self-contained account provides a valuable introduction for graduate students and will be of great importance for experts as well.

Allan PINKUS. — **n -widths in approximation theory.** — *Ergebnisse der Mathematik und ihrer Grenzgebiete*, 3. Folge, Bd. 7. — Un vol. relié, $17 \times 24,5$, de x, 291 p. — Prix : DM 118.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1985.

The theory of n -widths, one of the most active and interesting areas of approximation theory today, is described in this new "Ergebnisse" report. To date, approximately 200 original papers and brief surveys have been published in this field, almost all of which have appeared in the last twenty-five years. The subject of n -widths touches upon various extremal problems in analysis, interacting with and using tools from functional analysis, Tchebycheff systems and total positivity, matrix theory, and complex analysis. The monograph deals in detail with the problem of exact n -widths of Sobolev spaces and brings to the fore the underlying ideas.

Design of experiments: ranking and selection essays in honor of Robert E. Bechhofer. — Edited by Thomas J. Santner, Ajit C. Tamhane. — *Statistics: textbooks and monographs*, vol. 56. — Un vol. relié, $16 \times 23,5$, de xxii, 302 p. — Prix : FS 119.00. — Marcel Dekker, Inc., New York/Basel, 1984.

In 1954, Professor Robert E. Bechhofer introduced a radical change in the classical approach to formulating a class of problems previously treated by analysis of variance techniques. This new approach explicitly considers the goal of selecting superior treatments, a common objective in many comparative studies. Focusing on the theme of designing and analyzing experiments for selection, ranking, and multiple comparisons, this book surveys the latest developments in these, and related fields, by leading experts.

K. J. FALCONER. — **The geometry of fractal sets.** — *Cambridge tracts in mathematics*, vol. 85. — Un vol. relié, $15,5 \times 23,5$, de xiv, 162 p. — Prix : £17.50. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1985.

This book contains a rigorous mathematical treatment of the geometrical aspects of sets of both integral and fractional Hausdorff dimension. Questions of local density and the existence of tangents of such sets are studied, as well as the dimensional properties of their projections in various directions. In the case of sets of integral dimension the dramatic differences between regular "curve-like" sets and irregular "dust-like" sets are exhibited. The theory is related by duality to Kakeya sets. The final chapter includes diverse examples of sets to which the general theory is applicable: discussions of curves of fractional dimension, self-similar sets, strange attractors, and examples from number theory, convexity and so on. Exercises are included at the end of each chapter.

Kunihiko KODAIRA. — **Introduction to complex analysis.** — Translated by A. Sevenster. — Edited by A. F. Beardon. — Un vol. broché, $15 \times 22,5$, de ix, 256 p. — Prix : £8.95 (relié : £25.00). — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

The author's aim is to explain the basic theory in an easy-to-understand and careful way. He emphasizes geometrical considerations and, to avoid topological difficulties associated with complex analysis, begins by deriving Cauchy's integral formula in a topologically simple case and then deduces the basic properties of continuous and differentiable functions. The general versions of Cauchy's theorem and integral formula are proved. The remainder of the book deals with conformal mappings, analytic continuation, and Riemann's mapping theorem. Profusely illustrated, this book includes examples and problems.

Self-organizing methods in modeling: GMDH type algorithms. — Edited by Stanley J. Farlow. — Statistics: textbooks and monographs, vol. 54. — Un vol. relié, 16 × 23,5, de xiv, 350 p. — Prix: FS 146.00. — Marcel Dekker, Inc., New York/Basel, 1984.

Among statisticians, there is an increasing tendency towards nonparametric analytic techniques, notably, the rising interest in the group method of data handling (GMDH) algorithm. This heuristic, computer-oriented method provides the foundation for the construction of high-order regression models of complex systems. This unique work describes the GMDH algorithm in detail, allowing the development of new computer programs and discusses application in such diverse fields as economics, biology, and ecology, illustrating the practical insights gained with this technique. It presents a complete, up-to-date bibliography of publications in this field for easy referral and contains sample FORTRAN and SAS computer programs, simplifying application of the GMDH algorithm.

Alan E. GELFAND and Crayton C. WALKER. — **Ensemble modeling: inference from small-scale properties to large-scale systems.** — Statistics: textbooks and monographs, vol. 58. — Un vol. relié, 16 × 23,5, de xi, 282 p. — Prix: FS 122.00. — Marcel Dekker, Inc., New York/Basel, 1984.

This volume offers a unique statistical approach, utilizing populations of models in the analysis of complex systems. With this novel method, called "ensemble modeling", the book enables researchers to infer the behavioral properties of a system from small scale details. Completely up to date, this book examines the possibility of manipulating small scale details to achieve desired changes in system behavior; it suggests applications in biology, management, and marketing, combines theoretical and empirical approaches for thorough understanding and interrelates diverse disciplines for broad utility, gathering scattered literature in a single source. And for added clarity, the book illustrates the use of ensemble modeling through a thorough discussion of a biological application. In addition, with its use of switching nets and combinatorics, this work offers fascinating new insights for theoretical statisticians and systems and modeling theorists.

Gérard G. EMCH. — **Mathematical and conceptual foundations of 20th-century physics.** — North-Holland mathematics studies, vol. 100. Notas de matematica, vol. 100. — Un vol. broché, 17 × 24, de x, 550 p. — Prix: Dfl. 175.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

The main aim of the book is to provide a unified mathematical account of the conceptual foundations of 20th-century physics, under a single cover and in a form suitable for a one-year survey course in mathematics or mathematical physics. Emphasis is laid on the interlocked historical development of mathematical and physical ideas. *Contents: Classical physics:* Mechanics. Thermodynamics and statistical mechanics. Electromagnetism. — *Relativity:* Geometry. The principles of special relativity. General relativity. — *Quantum theory:* The old quantum theory. Hilbert space formulation of quantum mechanics. The algebraic formulation of quantum mechanics. Systems with infinitely many degrees of freedom.

Harald UPMEIER. — **Symmetric Banach manifolds and Jordan C*-algebras.** — North-Holland mathematics studies, vol. 104. — Notas de matematica, vol. 96. — Un vol. broché, 17 × 24, de xii, 444 p. — Prix: Dfl. 150.00. — North-Holland, Amsterdam/New York/Oxford, 1985.

This book links two of the most active research areas in present day mathematics, namely infinite dimensional holomorphy (on Banach spaces) and the theory of operator algebras (C^* -algebras and their non-associative generalizations, the Jordan C^* -algebras). It organizes in a systematic way a wealth of recent results which are so far only accessible in research journals and contains additional original contributions. Using Banach Lie groups and Banach Lie algebras, a theory of transformation groups on infinite dimensional manifolds is presented which covers many important examples such as Grassmann manifolds and the unit balls of operator algebras. The theory has also potential importance for mathematical physics by providing foundations for the construction of infinite dimensional curved phase spaces in quantum field theory.

Samuel KAPLAN. — **The bidual of $C(X)$ I.** — North-Holland mathematics studies, vol. 101. — Un vol. broché, $16,5 \times 24$, de xvi, 424 p. — Prix: Dfl. 150.00. — North-Holland, Amsterdam/New York/Oxford, 1985.

This work is the first systematic representation of the Riesz ideal and Riesz subspace structure of $C''(X)$ (corresponding to the ideal and sub-algebra structure of an algebra). Topological methods constitute too coarse a tool to separate, or even discover, the various subspaces involved, hence the author adopts a Banach lattice approach. It is the existence, of $C(X)$ as a distinguished subspace of $C''(X)$ which marks the latter off from general Banach lattices, or even M -spaces. Thus the program followed is to start from the canonical imbedding of $C(X)$ and explore the consequences which flow from this. — *Main features:* The study of $C(X)$ as a Banach lattice rather than a Banach space or Banach algebra; the emergence of the space of universally integrable elements as the central subspace (after $C(X)$ itself); the new light shed on integration theory (including Riemann integration), general topology, and Boolean algebra.

Stochastic analysis. — Proceedings of the Taniguchi international symposium on stochastic analysis, Katata and Kyoto, 1982. — Edited by Kiyosi Itô. — North-Holland mathematical library, vol. 32. — Un vol. relié, $16 \times 22,5$, de viii, 488 p. — Prix: Dfl. 250.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1984.

Stochastic analysis is a branch of probability theory stemming from the theory of stochastic differential equations. It is becoming increasingly important in close connection with partial differential equations, non-linear functional analysis, control theory and statistical mechanics. — 19 exposés par: N. Ikeda, S. Watanabe, J. M. Bismut, R. Figari, E. Orlandi, G. Papanicolaou, T. Funaki, B. Gaveau, R. Holley, K. Itô, S. Kotani, H. Kunita, S. Kusuoka, D. Stroock, Y. Le Jan, P. L. Lions, P. Malliavin, D. Michel, I. Shigekawa, M. Suzuki, Y. Takahashi, H. Tanaka.

Algebraic and combinatorial methods in operations research. — Proceedings of the workshop on algebraic structures in operations research. — Edited by R. E. Burkard, R. A. Cuninghame-Green and U. Zimmermann. — Annals of discrete mathematics, vol. 19. — North-Holland mathematics studies, vol. 95. — Un vol. broché, $16,5 \times 24$, de viii, 382 p. — Prix: Dfl. 150.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

For the first time, this book unites different algebraic approaches for discrete optimization and operations research. The presentation of some fundamental directions of this new fast developing area shows the wide range of its applicability. Specifically, the book contains contributions in the following fields: semigroup and semiring theory

applied to combinatorial and integer programming, network flow theory in ordered algebraic structures, extremal optimization problems, decomposition principles for discrete structures, Boolean methods in graph theory and applications.

Topics on perfect graphs. — Edited by C. Berge and V. Chvatal. — Annals of discrete mathematics, vol. 21. — North-Holland mathematics studies, vol. 88. — Un vol. broché, $16,5 \times 24$, de xiv, 369 p. — Prix: Dfl. 250.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

The purpose of this book is to present selected results on perfect graphs in a single work. These take the form of reprinted classical papers, survey papers and new results. They concern different aspects of perfect graphs: general results, special cases of perfect graphs, polyhedral point of view, which graphs are imperfect, and which are perfect, optimization in perfect graphs.

Rick GREER. — **Trees and hills: methodology for maximizing functions of systems of linear relations.** — Annals of discrete mathematics, vol. 22. — North-Holland mathematics studies, vol. 96. — Un vol. broché, $16,5 \times 24$, de xiv, 352 p. — Prix: Dfl. 120.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

This book describes the tree algorithm for maximizing functions of systems of linear relations subject to constraints. One such problem in this class is that of identifying all of those vectors which satisfy as many of a given inconsistent system of linear inequalities and equalities as possible. Problems from this class are typically *NP*-complete and include problems from the areas of statistical classification and numerical edits and imputation. The tree algorithm is currently the best algorithm for solving these kinds of problems.

Orders: description and roles in set theory, lattices, ordered groups, topology, theory of models and relations, combinatorics, effectiveness, social sciences. — Proceedings of the conference on ordered sets and their applications, Château de la Tourette, l'Arbresle, July 5-11, 1982. — Edited by Maurice Pouzet and Denis Richard. — North-Holland mathematics studies, vol. 99. — Annals of discrete mathematics, vol. 23. — Un vol. broché, $16,5 \times 23$, de xxvii, 548 p. — Prix: Dfl. 200.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

There is an increasing recognition of the importance of order and an acceleration in the development of its theory. The 27 papers in this volume survey various aspects of the theory of order. These have been grouped into nine sections illustrating some of the main mathematical themes and applications in the theory: order and some set-theoretical invariants, order and lattices, order and ordered groups, order and topology, order and theory of models and relations, order and chain condition on classes of structures, order and combinatorics, order and effectiveness, order and social sciences.

Serge LANG. — **Algebra.** — Addison-Wesley series in mathematics. — Un vol. relié, $16 \times 23,5$, de xvii, 526 p. — Revised printing 1971. — Addison-Wesley Publishing Co., Reading, Mass./Menlo Park, Calif./London/Amsterdam/Don Mills, Ont./Sydney, 1984 [?].

Groups, rings and modules: Groups. Rings. Modules. Homology. Polynomials. Noetherian rings and modules. — *Field theory:* Algebraic extensions. Galois theory. Extensions of rings. Transcendental extensions. Real fields. Absolute values. — *Linear algebra and representations:* Matrices and linear maps. Structure of bilinear forms.

Representation of one endomorphism. Multilinear products. Semisimplicity. Representations of finite groups. — Appendixes.

V. A. MOROZOV. — **Methods for solving incorrectly posed problems.** — Translation by A. B. Aries, translation editor by Z. Nashed. — Un vol. broché, $15,5 \times 23,5$, de xviii, 257 p. — Prix: DM 118.00. — Springer-Verlag, New York/Berlin/Tokyo, 1984.

Improperly posed problems are of increasing importance in the applications of differential equations to mathematical physics and occur in questions such as the Cauchy problem for the Laplace equations, the continuation problem for analytic and harmonic functions, geophysical problems, the supersonic body problem and biophysical problems. This book is devoted to important special topics from the theory and reflects much of the recent progress that has been achieved in the Soviet Union.

Roger COOKE. — **The mathematics of Sonya Kovalevskaya.** — Un vol. relié, 16×24 , de xiii, 234 p. — Prix: DM 96.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

The author assesses in this book the significance of Kovalevskaya's mathematical work by tracing parts of the history of the problems she studied and by analyzing her methods of proof. His purpose is to focus attention on some important parts of late 19th century mathematics and show that Kovalevskaya was an important and creative member of the mathematical community of the time. Even though Kovalevskaya's biography has been studied in great detail, this is the first thorough and fairly complete exposition of her mathematical work.

Rudolf LIDL, Günter PILZ. — **Applied abstract algebra.** — Undergraduate texts in mathematics. — Un vol. relié, $16,5 \times 24$, de xviii, 545 p. — Prix: DM 136.00. — Springer-Verlag, Berlin/Heidelberg/Tokyo, 1984.

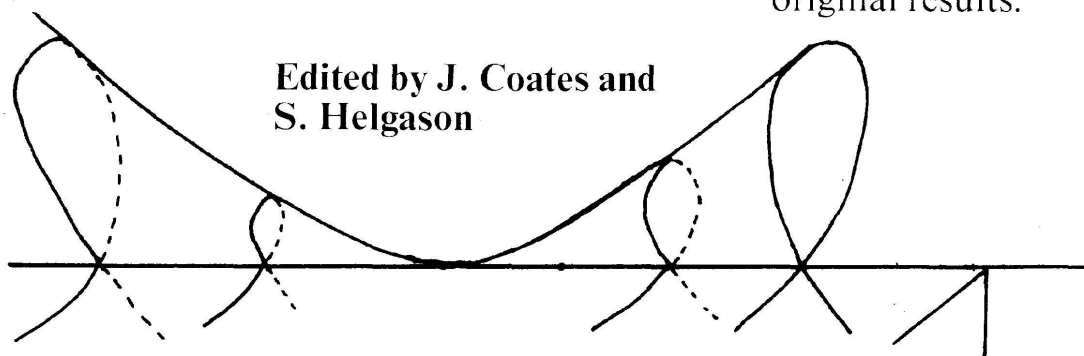
This textbook presents expositions of those parts of abstract algebra which play an important role in discrete applied mathematics. The three major themes and applications are particularly relevant to computer science: Boolean algebras and switching circuits, finite fields and algebraic coding, semigroups and automata. Throughout the text, emphasis is put on worked out computational problems without solutions and numerical problems.

Measure theory, Oberwolfach 1983. — Proceedings of the conference held at Oberwolfach, June 26-July 2, 1983. — Ed. by D. Kölzow and D. Maharam-Stone. — Lecture notes in mathematics, vol. 1089. — Un vol. broché, $16,5 \times 24$, de xiii, 327 p. — Prix: DM 45.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This volume contains the Proceedings of the conference on measure theory, held at the Mathematical Research Institute at Oberwolfach from June 26 till July 2, 1983. In this meeting, 51 mathematicians from 18 countries participated; 41 papers were presented, and 2 problem sessions were held.

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