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## BULLETIN BIBLIOGRAPHIQUE

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Helmut STRADE, Rolf FARNSTEINER. — **Modular Lie algebras and their representations.** — Pure and applied mathematics, vol. 116. — Un vol. relié,  $16 \times 24$ , de VIII, 301 p. — Prix: \$ 79.75 (USA et Canada) \$ 95.50 (tous les autres pays). — Marcel Dekker, New York, 1988.

This book clarifies differences between classical and modern theories and presents essential tools for advanced study, examines the modular structure theory in a concise manner, advances beyond the classical methods and introduces new concepts needed for the classification of restricted simple Lie algebras, demonstrates features that contrast sharply with the classical case, etc.

Lucas N.H. BUNT, Phillip S. JONES, Jack D. BEDIENT. — **The historical roots of elementary mathematics.** — Un vol. broché,  $13,5 \times 21,5$ , de XII, 299 p. — Prix: \$ 7.95. — Dover Publications, Inc., New York, 1988.

Written in a fresh and thoroughly diverting style, this unique text traces the history of mathematics, beginning with the Egyptians and ending with abstract foundations laid at the end of the 19th century. The book encourages readers to carry out fundamental algebraic and geometric operations used by the Egyptians and Babylonians and to tackle still-famous problems, such as squaring the circle.

**Studies in the history of mathematics.** — Esther R. Phillips, editor. — Studies in mathematics, vol. 26. — Un vol. relié,  $14 \times 20,5$ , de 308 p. — Prix: £ 32.75. — The Mathematical Association of America, Washington D.C., marketed and distributed by John Wiley and Sons Ltd., 1987.

E.R. Phillips: Introduction. — H.M. Edwards : Dedekind's invention of ideals. — T. Hawkins: Non-Euclidean geometry and Weierstrassian mathematics, the background to Killing's work on Lie algebras. — J. Gray: The discovery of non-Euclidean geometry. — D.M. Johnson: L.E.J. Brouwer's coming of age as a topologist. — G.H. Moore: A house divided against itself, the emergence of first-order logic as the basis for mathematics. — M. Davis: Mathematical logic and the origin of modern computers. — W. Aspray: The mathematical reception of the modern computer, John von Neumann and the Institute for Advanced Study Computer. — H. Mehrrens: Ludwig Bieberbach and «Deutsche Mathematik». — J. Lützen: The solution of partial differential equations by separation of variables, a historical survey. — J. Dieudonné: The beginning of Italian algebraic geometry.

Jean-Pierre SERRE. — **Algebraic groups and class fields.** — Graduate texts in mathematics, vol. 117. — Un vol. relié,  $16 \times 24,5$ , de IX, 207 p. — Prix: DM 72.00. — Springer-Verlag, New York, 1988.



Summary of main results. — Algebraic curves. — Maps from a curve to a commutative group. — Singular algebraic curves. — Generalized Jacobians. — Class field theory. — Group extension and cohomology.

Georg POLYA. — **Mathematik und plausible Schliessen, Bd. 1: Induktion und Analogie in der Mathematik.** — Ins Deutsche übersetzt von Lulu Bechtolsheim. — 3. Auflage. — Wissenschaft und Kultur, Bd. 14. — Un vol. relié,  $16,5 \times 22,5$ , de 403 p. — Prix: Sfr 74.00. — Birkhäuser Verlag, Basel, 1988.

Dieses Buch ist wohl einzig in seiner Art, zeigt nicht die fertige, zu formalen Beweisen erstarrte Mathematik, sondern gewährt Einblick in die im Entstehen begriffene: in die Denkprozesse, welche zur Auffindung des Beweises und zur Lösung der Aufgabe führen. Lebhaft und überzeugend dargestellte, meist elementare Beispiele aus Mathematik und Physik zeigen die Rolle von Vermuten, Erraten, Induktion, und Analogie.

**Special classes of linear operators and other topics 11th International Conference on Operator Theory, Bucharest, Romania, June 2-12, 1986.** — Volume editors, H. Helson, C.M. Pearcy, F.-H. Vasilescu, D. Voiculescu. — Managing editor, Gr. Arsene. — Operator theory, vol. 28. — Un vol. relié,  $17 \times 23,5$ , de 322 p. — Prix: Sfr. 98.00. — Birkhäuser Verlag, Basel, 1988.

This volume consists of a careful selection of papers contributed by the participants of this conference. They reflect most of the topics dealt with in modern operator theory, including recent advances in dual operator algebras and the invariant subspace problem, operators in indefinite metric spaces, hyponormal, quasitriangular and decomposable operators and various problems in  $C^*$ - and  $W^*$ -algebras.

**Topics in operator theory and interpolation.** — Essays dedicated to M.S. Livsic on the occasion of his 70th birthday. — Edited by I. Gohberg. — Operator theory, vol. 29. — Un vol. relié,  $17 \times 23,5$ , de 243 p. — Prix: Sfr. 76.00. — Birkhäuser Verlag, Basel, 1988.

The book opens with the biography and a list of publications of M.S. Livsic, and contains a selection of papers which cover a broad spectrum of topics ranging from operator theory to systems theory. The majority of the papers are related to different interpolation problems and the Schur algorithm.

**Quantitative analysis of mineral and energy resources.** — Edited by C.F. Chung, A.G. Fabbri, R. Sinding-Larsen. — NATO ASI series, series C: mathematical and physical sciences, vol. 223. — Un vol. relié,  $16 \times 23,5$ , de XVIII, 738 p. — Prix: Dfl. 275.00. — D. Reidel Publishing Company, Dordrecht, 1988.

This volume contains the edited papers prepared by participants of the NATO Advanced Study Institute on Statistical Treatments for Estimation of Mineral and Energy Resources held at Il Ciocco (Lucca), Italy, June 22-July 4, 1986. At the Institute, several new procedures in mathematical geology were presented. Forty papers and five workshop reports in this volume contribute to the current state of knowledge in mathematical geology and its use in resource evaluation.

Claude DELLACHERIE, Paul-André MEYER. — **Probabilities and potential C: Potential theory for discrete and continuous semigroups.** — North-Holland mathematics studies, vol. 151. — Un vol. broché,  $16,5 \times 24$ , de XIV, 416 p. — Prix: Dfl. 175.00. — North-Holland, Amsterdam, 1988.

The first chapter develops potential theory with respect to a single kernel. The second chapter begins with a study of the notion of reduction in the most general situation possible, the «gambling house» of Dubins and Savage. The results presented are then connected with the theory of sweeping with respect to a cone of continuous functions, and the integral representation in compact convex sets. The third chapter presents new or little-known results, with the aim of illustrating the effectiveness of capacitary methods in the most varied fields. The last two chapters are concerned with the theory of resolvents.

Rudolf LIDL, Harald NIEDERREITER. — **Introduction to finite fields and their applications.** — Un vol. relié, 16 × 23,5, de VIII, 407 p. — Prix: \$19.50. — Cambridge University Press, Cambridge, 1986.

The first part of this book presents an introduction to the theory of finite fields, emphasising those aspects that are relevant for application. The second part is devoted to a discussion of the most important applications of finite fields, especially to information theory, algebraic coding theory and cryptology. There is also a chapter on applications within mathematics, such as finite geometries, combinatorics and pseudo-random sequences.

**Numerical recipes in C: the art of scientific computing.** — William H. Press, Brian P. Flannery, Saul A. Teukolsky, William T. Vetterling. — Un vol. relié, 17 × 24, de XXII, 735 p. — Prix: 27.50. — Cambridge University Press, Cambridge, 1988.

Preliminaries. — Solution of linear algebraic equations. — Interpolation and extrapolation. — Integration of functions. — Evaluation of functions. — Special functions. — Random numbers. — Sorting. — Root finding and nonlinear sets of equations. — Minimization or maximization of functions. — Eigensystems. — Fourier transform spectral methods. — Statistical description of data. — Modeling of data. — Integration of ordinary differential equations. — Two point boundary value problems. — Partial differential equations. Appendices. *The computer programs in this book are available in several machine readable formats on diskettes in IBM-compatible personal computer format.*

Yuri KIFER. — **Random perturbations of dynamical systems.** — Progress in probability and statistics, vol. 16. — Un vol. relié, 15 × 23,5, de 294 p. — Prix: Sfr. 74.00. — Birkhäuser, Boston, 1988.

This book presents the first systematic treatment of the influence of small random perturbations on systems with complicated dynamics, usually with some kind of hyperbolicity conditions. Its subject is on the border between dynamical systems and stochastic processes, and many results have direct applications to partial differential equations with small parameters.

Johann I. BERNOULLI. — **Der Briefwechsel von Johann I Bernoulli, Band 2, Der Briefwechsel mit Pierre Varignon, erster Teil: 1692-1702.** — Bearbeitet und kommentiert von Pierre Costabel und Jeanne Peiffer. — Unter Benutzung von Vorarbeiten von Joachim Otto Fleckenstein. — Die gesammelten Werke der Mathematiker und Physiker der Familie Bernoulli, herausgegeben von der Naturforschenden Gesellschaft in Basel. — Un vol. relié, 20 × 26,5, de XVIII, 442 p. — Prix: Sfr. 168.00. — Birkhäuser Verlag, Basel, 1988.

Diese Korrespondenz, die erst durch Varignons Tod abgebrochen wurde, wird noch zwei weitere Bände füllen. Wie L'Hôpital, war auch Varignon einer der wichtigsten Vertreter des Leibnizschen Kalküls in Frankreich. Beide waren eigentlich Schüler Bernoullis. Varignon nahm in den wissenschaftlichen Kreisen der französischen Hauptstadt, vor allem in der Académie royale des sciences, eine hervorragende Stellung ein und spielte eine wichtige Vermittlerrolle zwischen Bernoulli und der Akademie.

James A. HUCKABA. — **Commutative rings with zero divisors.** — Pure and applied mathematics, vol. 117. — Un vol. relié, 16 × 23,5, de x, 216 p. — Prix: \$79.75 (U.S.A. et Canada), \$95.50 (autres pays). — Marcel Dekker, Inc., New York, 1988.

This is the first book to present a unified treatment of commutative ring theory, for rings with zero divisors, by the ideal theoretic method. In some parts of commutative algebra, the ideal theoretic method has been useful in studying integral domains; but until recently, has not been used to study rings with zero divisors. Much of multiplicative ideal theory falls into this category. Yet in other areas there are important questions about the ideals of rings with zero divisors that do not have counterparts in the theory of integral domains. An example of this is determining when the space of minimal prime ideals of a commutative ring is compact.

E. RAMIS, Cl. DESCHAMPS, J.ODOUX. — **Algèbre: exercices avec solutions.** — Un vol. broché, 16 × 24, de 194 p. — Prix: FF 95.00. Masson, Paris, 1988.

L'ouvrage tient compte des lignes directrices des récents programmes des Classes préparatoires aux Grandes Ecoles et présente une actualisation en conséquence du choix des 161 exercices et des deux problèmes qui ont été répartis en cinq thèmes, de façon à développer l'esprit de synthèse du lecteur: structures usuelles, polynômes et fractions rationnelles, espaces vectoriels, réduction des endomorphismes, algèbre bilinéaire.

E. ARTIN. — **Geometric algebra.** — Interscience tracts in pure and applied mathematics, vol. 3. — Wiley classics library. — Un vol. broché, 15 × 23, de x, 214 p. — Prix: £25.95. — Interscience Publishers, Inc., a division of John Wiley & Sons, Inc., New York, 1988.

Preliminary notions. — Affine and projective geometry. — Symplectic and orthogonal geometry. — The general linear group. — The structure of symplectic and orthogonal groups.

R. COURANT. — **Differential and integral calculus.** — Translated by E.J. McShane. — Wiley classics Library. — 2 vol. brochés, 15 × 23, de XIII, 616 p. et x, 682 p., respectivement. — Prix: £25.95, chaque volume. — Interscience Publishers, Inc., a division of John Wiley & Sons, Inc., New York, 1988.

*Contents of vol. 1* (2nd edition): Introduction. — The fundamental ideas of the integral and differential calculus. — Differentiation and integration of the elementary functions. — Further development of the integral calculus. — Applications. — Taylor's theorem and the approximate expression of functions by polynomials. — Numerical methods. — Infinite series and other limiting processes. — Fourier series. — A sketch of the theory of functions of several variables. — The differential equations for the simplest types of vibration. — *Contents of vol. 2*: Preliminary remarks on analytical geometry and vector analysis. — Functions of several variables and their derivatives. — Developments and applications of the differential calculus. — Multiple integrals. — Integration over regions in several dimensions. — Differential equations. — Calculus of variations. — Functions of a complex variable.

Charles W. CURTIS, Irving REINER. — **Representation theory of finite groups and associative algebras.** — Wiley classics library. — Un vol. broché, 15 × 23, de XIV, 689 p. — Prix: £25.95. John Wiley & Sons, New York, 1988.

Background from group theory. — Representations and modules. — Algebraic number theory. — Semi-simple rings and group algebras. — Group characters. Induced characters. — Induced representations. — Non semi-simple rings. — Frobenius algebras. — Splitting fields and separable algebras. — Integral representations. — Modular representations.

Nelson DUNFORD, Jacob T. SCHWARTZ. — **Linear operators. Wiley classics library.** — 3 vol. brochés,  $15 \times 23$ , de 2592 p. pour l'ensemble des 3 vol. — Prix: £25.95 chaque volume. — Wiley-Interscience, a division of John Wiley & Sons, 1988.

*Contents of vol. 1:* General theory: Preliminary concepts. — Three basic principles of linear analysis. — Integration and set functions. — Special spaces. — Convex sets and weak topologies. — Operators and their adjoints. — General spectral theory. — Applications. — *Contents of vol. 2:* Spectral theory: self adjoint operators in Hilbert spaces:  $B$ -algebras. — Bounded normal operators in Hilbert space. — Miscellaneous applications. — Unbounded operators in Hilbert space. — Ordinary differential operators. — Linear partial differential equations and operators. — *Contents of vol. 3:* Spectral operators. — Spectral operators: sufficient conditions. — Algebras of spectral operators. — Unbounded spectral operators. — Perturbations of spectral operators with discrete spectra. — Spectral operators with continuous spectra: applications of the general theory.

Peter HENRICI. — **Applied and computational complex analysis, vol. 1: Power series, integration, conformal mapping, location of zeros.** — Wiley classics library. — Un vol. broché,  $15 \times 23$ , de xv, 682 p. — Prix: \$25.95. — John Wiley & Sons, 1988.

Formal power series. — Functions analytic at a point. — Analytic continuation. — Complex integration. — Conformal mapping. — Polynomials. — Partial fractions.

C.L. SIEGEL. — **Topics in complex functions, vol. 1 and 2.** — Interscience tracts in pure and applied mathematics, vol. 25. — Wiley classics library. — 2 vol. brochés,  $15 \times 23$ , de respectivement, ix, 186 p. et ix, 193 p. — Prix: \$25.95 chaque volume. — Wiley-Interscience, a division of John Wiley & Sons, 1988.

*Contents of vol. 1:* Elliptic functions. — Uniformization theory. — *Contents of vol. 2:* Automorphic functions. — Abelian integrals.

T. NISHIZEKI, N. CHIBA. — **Planar graphs : theory and algorithms.** — North-Holland mathematics studies, vol. 140. — Annals of discrete mathematics, vol. 32. — Un vol. relié,  $16,5 \times 24,5$ , de xii, 232 p. — Prix: Dfl. 190.00. — North-Holland, Amsterdam, 1988.

Collected in this volume are most of the important theorems and algorithms currently known for planar graphs, together with constructive proofs for the theorems. Many of the algorithms are written in Pidgin Pascal. The first two chapters provide the foundations of graph theoretic notions and algorithmic techniques. The remaining chapters discuss the topics of planarity testing, embedding, drawing, vertex- or edge-coloring, maximum independence set, subgraph listing, planar separator theorem, Hamiltonian cycles, and single- or multicommodity flows.

Henri MASCART, Marius STOKA. — **Fonctions d'une variable réelle: exercices et corrigés, t. 4.** — Collection «Mathématiques». — Un vol. broché,  $15 \times 21,5$ , de 254 p. — Prix: FF 195.00. Presses universitaires de France, Paris, 1988.

Ce livre met en évidence les fonctions réelles d'une variable réelle qui possèdent des propriétés intéressantes (par exemple, fonctions convexes, fonctions à variation bornée, ...). Les chapitres suivants étudient les séries numériques et les séries de fonctions à l'aide des résultats classiques, en insistant sur les différentes notions de convergence.

Horst HERRLICH. — **Topologie II: Uniforme Räume.** — Berliner Studienreihe zur Mathematik, Bd. 3. — Un vol. broché,  $17 \times 24$ , de xi, 264 p. — Prix: DM 48.00. — Heldermann Verlag, Berlin, 1988.

Überdeckungsstrukturen, Grundbegriffe und Beispiele. — Gleichmässig stetige Abbildungen. — Fundamentalkonstruktionen. — Trennungseigenschaften. — Zusammenhangeigenschaften. — Kompaktheitseigenschaften. — Vervollständigung. — Funktionenräume.

**Analysis of one complex variable.** — Proceedings of the American Mathematical Society, 821st Wyoming Meeting, University of Wyoming, August 10-15, 1985. — Editor: Chung-chun Yang. — Un vol. relié, XII, 213 p. — Prix: \$31.30. — World Scientific Publishing Company, Singapore, distributed by John Wiley & Sons Ltd., 1987.

*From the preface:* A recent and significant accomplishment in this field is the verification of a more than 55-year-old conjecture raised by R. Nevanlinna, the founder of the modern value-distribution theory, which concerns the validity of the second fundamental theorem for small (deficient) functions. Almost simultaneously two different proofs appeared, one by Osgood (1985) and the other by Steinmetz (1986). In this book, Osgood gives a brief history of the methods developed to lead a final proof of the conjecture, as well as a simplification of his own proof. Chuang's paper reintroduces Steinmetz's argument with some technical generalizations.

S.S. AGAIAN. — **Hadamard matrices and their applications.** — Lecture notes in mathematics, vol. 1168. — Un vol. broché, 16,5 × 24, de 227 p. — Prix: DM 31.50. — Springer-Verlag, Berlin, 1985.

Basic definitions, notations, and auxiliary results. — Construction of classic Hadamard matrices. — Construction of generalized Hadamard matrices. — Application of Hadamard matrices on information theory, design theory and other topics. — Unanswered problems. — Tables of block-circulant, bloc symmetric (plane and high-dimensional) Hadamard matrices, Hadamard matrices of order  $(4n)$ .

**Probability theory and mathematical statistics.** — Proceedings of the 5th Japan-USSR Symposium, held in Kyoto, Japan, July 8-14, 1986. — Edited by S. Watanabe, Yu. V. Prokhorov. — Lecture notes in mathematics, vol. 1299. — Un vol. broché, 16,5 × 24, de VIII, 589 p. — Prix: DM 93.00. — Springer-Verlag, Berlin, 1988.

This proceedings of the 5th joint meeting of Japanese and Soviet probabilists comprise 61 original research papers on topics including limit theorems, stochastic analysis, control theory, statistics, probabilistic methods in number theory and mathematical physics.

George B. SELIGMAN. — **Constructions of Lie algebras and their modules.** — Lecture notes in mathematics, vol. 1300. — Un vol. broché, 16,5 × 24, de VI, 190 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1988.

This book deals with central simple Lie algebras over arbitrary fields of characteristic zero. It aims to give constructions of the algebras and their finite-dimensional modules in terms that are rational with respect to the given ground field. All isotropic algebras with non-reduced relative root systems are treated, along with classical anisotropic algebras. The latter are treated by what seems to be a novel device, namely by studying certain modules for isotropic classical algebras in which they are embedded. In this development, symmetric powers of central simple associative algebras, along with generalized even Clifford algebras of involutorial algebras, play central roles. Considerable attention is given to exceptional algebras.

**Function spaces and applications.** — Proceedings of the US-Sweedish Seminar held in Lund, Sweden, June 15-21, 1986. — Edited by M. Cwikel, J. Peetre, Y. Sagher, H. Wallin. — Lecture



notes in mathematics, vol. 1302. — Un vol. broché,  $16,5 \times 24$ , de VI, 445 p. — Prix: DM 65.00. — Springer-Verlag, Berlin, 1988.

This seminar is a loose continuation of two previous conferences held in Lund (1982, 1983), mainly devoted to interpolation spaces, which resulted in the publication of the Lecture notes in mathematics, vol. 1070. This explains the bias towards that subject. The idea this time was, however, to bring together mathematicians also from other related areas of analysis. To emphasize the historical roots of the subject, the collection is preceded by a lecture on the life of Marcel Riesz.

**Quantum probability and applications III. Proceedings of a Conference held in Oberwolfach, FRG, January 25-31, 1987.** — Edited by L. Accardi, W. von Waldenfels. — Lecture notes in mathematics, vol. 1303. — Un vol. broché,  $16,5 \times 24$ , de VI, 373 p. — Prix: DM 57.50. — Springer-Verlag, Berlin, 1988.

The main topics discussed were: quantum stochastic calculus, mathematical models of quantum noise and their applications to quantum optics, the quantum Feynman-Kac formula, quantum probability and models of quantum statistical mechanics, the notion of conditioning in quantum probability and related problems (dilations, quantum Markov processes), quantum central limit theorems. With the exception of one review article on quantum Markov processes, all contributions are original research papers.

Fernando Q. GOUVEA. — **Arithmetic of  $p$ -adic modular forms.** — Lecture notes in mathematics, vol. 1304. — Un vol. broché,  $16,5 \times 24$ , de VIII, 121 p. — Prix: DM 23.00. — Springer-Verlag, Berlin, 1988.

The central topic of this research monograph is the relation between  $p$ -adic modular forms and  $p$ -adic Galois representations, and in particular the theory of deformations of Galois representations recently introduced by Mazur. The classical theory of modular forms is assumed known to the reader, but the  $p$ -adic theory is reviewed in detail. The results on the  $U$  operator and on Galois representations are new.

D.S. LUBINSKY, E.B. SAFF. — **Strong asymptotics for extremal polynomials associated with weights on  $\mathbf{R}$ .** Lecture notes in mathematics, vol. 1305. — Un vol. broché,  $16,5 \times 24$ , de VII, 153 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1988.

This monograph is fairly self-contained, with proofs involving elementary complex analysis, and the theory of orthogonal and extremal polynomials. It should be of interest to research workers in approximation theory and orthogonal polynomials.

**Partial differential equations.** — Proceedings of a Symposium held in Tianjin, June 23-July 5, 1986. — Edited by S.S. Chern. — Lecture notes in mathematics, vol. 1306. — Un vol. broché,  $16,5 \times 24$ , de VI, 294 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1988.

The volume contains a selection of papers presented at the 7th Symposium on differential geometry and differential equations held at the Nankai Institute of Mathematics, Tianjin, China, in 1986. Most of the contributions are original research papers on topics including elliptic equations, hyperbolic equations, evolution equations, non-linear equations from differential geometry and mechanics, micro-local analysis.

Takafumi MURAI. — **A real variable method for the Cauchy transform and analytic capacity.** — Lecture notes in mathematics, vol. 1307. — Un vol. broché,  $16,5 \times 24$ , de VII, 133 p. — Prix: DM 24.00. — Springer-Verlag, Berlin, 1988.

This research monograph studies the Cauchy transform on curves with the object of formulating a precise estimate of analytic capacity. The first chapter is a review of the Calderón commutator. In the second chapter, a real variable method for the Cauchy transform is given using only the rising sun lemma. The final and principal chapter uses the method of the second chapter to compare analytic capacity with integral-geometric quantities.

Norbert SCHAPPACHER. — **Periods of Hecke characters.** — Lecture notes in mathematics, vol. 1301. — Un vol. broché,  $16,5 \times 24$ , de xv, 160 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1988.

The starting point of this monograph is Deligne's theorem about absolute Hodge cycles on Abelian varieties. Its applications to the theory of motives with complex multiplication are systematically reviewed. The last chapter contains a special case in which Deligne's theorem does not apply.

Philippe TONDEUR. — **Foliations on Riemannian manifolds.** — Universitext. — Un vol. broché,  $15,5 \times 23,5$ , de xi, 247 p. — Prix: DM 58.00. — Springer-Verlag, New York, 1988.

This book introduces the reader to the theory of foliations, and explore some of the interactions of foliations with the Riemannian geometry of the ambient manifold. The author proceeds to discuss the instructive special case of transversally oriented foliations of codimension one. The second part of the book covers such topics as foliations by level hypersurfaces, infinitesimal automorphisms and basic forms, flows, Lie foliations, and twisted duality.

Eberhard ZEIDLER. — **Nonlinear functional analysis and its applications: IV, Applications to mathematical physics.** — Translated by Juergen Quandt. — Un vol. relié,  $16,5 \times 24$ , de xxiii, 975 p. — Prix: DM 298.00. — Springer-Verlag, New York, 1988.

Topics covered in this volume include applications to mechanics, elasticity, plasticity, hydrodynamics, thermodynamics, statistical physics, and special and general relativity including cosmology. The book contains a detailed physical motivation of the relevant basic equations and a discussion of particular problems which have played a significant role in the development of physics and through which important mathematical and physical insight may be gained. An attempt is made to combine classical and modern ideas and to build a bridge between the language and thoughts of physicists and mathematicians. Many exercises and a comprehensive bibliography complement the text.

Martin GROETSCHEL, László LOVASZ, Alexander SCHRIJVER. — **Geometric algorithms and combinatorial optimization.** — Algorithms and combinatorics, vol. 2. — Un vol. broché,  $17,5 \times 25$ , de xii, 362 p. — Prix: DM 148.00. — Springer-Verlag, New York, 1988.

This book develops geometric techniques for proving the polynomial time solvability of problems in convexity theory, geometry, and, in particular, combinatorial optimization. It offers a unifying approach based on two fundamental geometric algorithms: the ellipsoid method for finding a point in a convex set, and the basis reduction method for point lattices.

Daniel KASTLER. — **Cyclic cohomology within the differential envelope : an introduction to Alain Connes' non-commutative differential geometry.** — Travaux en cours, vol. 30. — Un vol. broché,  $17 \times 24$ , de 183 p. — Hermann, Paris, 1988.

La cohomologie cyclique est la structure de base de la géométrie différentielle non-commutative (calcul différentiel et integral quantique). Le lecteur mathématicien ou physicien

trouvera dans cette monographie une description détaillée de la méthode d'exposition originale de A. Connes, d'intérêt accru après l'apparition de la théorie de Connes-Cuntz des cocycles cycliques positifs.

Frank MORGAN. — **Geometric measure theory: a beginner's guide.** — Un vol. relié,  $15,5 \times 23,5$  de VIII, 145 p. — Prix: US\$ 19.95. — Academic Press, Boston, 1988.

Geometric measure theory has contributed over the past thirty years to major advances in geometry and analysis, including, for example, the original proof of the positive mass conjecture in cosmology. This well-illustrated introduction to the subject provides the newcomer with the basic material to confront the literature and to understand and contribute to the subject.

Paulo RIBENBOIM. — **The book of prime number records.** — Un vol. relié,  $16 \times 24$  de XXIII, 476 p. — Prix : DM 98.00. — Springer-Verlag, New York, 1988.

This book aims to be the analogue for prime numbers of the Guinness Book of World Records. It collects a large number of results and techniques related to all aspects of the theory of prime numbers. The book begins with a chapter on the proofs that there are infinitely many primes, and proceeds through such topics as primality tests, factorization methods, the distribution of primes, special types of primes, and heuristic results.

**Mathematical aspects of scientific software.** — J.R. Rice, ed. — The IMA volumes in Mathematics and its Applications, vol. 14. — Un vol. relié,  $16 \times 24$ , de VI, 208 p. — Prix : DM 39.00. — Springer-Verlag, New York, 1988.

This book explores how scientific software impacts the structure of mathematics, how it creates new subfields, and how new classes of mathematical problems arise. The focus is on five topics where the impact is currently being felt and where important new challenges exist : the new subfield of parallel and geometric computations, the emergence of symbolic computation systems into «general» use, the potential emergence of new, high-level mathematical systems, and the crucial question of how to measure the performance of mathematical problem solving tools.

André DELESSERT. — **Introduction à la logique.** — Collection «Mathématiques». — Un vol. broché,  $16 \times 24$ , de 200 p. — Prix : Sfr. 68.50. — Presses polytechniques romandes, Lausanne, 1988.

Destiné à un large public, ce livre est axé principalement sur la logique du premier ordre. L'intention générale est de proposer des faits de logique non banals, tels que le théorème de complétude de la logique de premier ordre et ses premiers corollaires. Quelques relations avec la langue, la philosophie et les fondements des mathématiques sont abordées à la lumière des résultats démontrés.

Charles LOEWNER. — **Collected papers.** — Edited by Lipman Lipers. — Un vol. relié,  $18,5 \times 26$ , de XII, 517 p. — Prix : Sfr. 138.00. — Birkhäuser, Boston, 1988.

This volume contains essentially all of the published papers by Charles Loewner (originally Karl Löwner), who died on January 8, 1968. From the Memorial Resolution passed by Stanford University : «Loewner was a mathematician of world renown, whose contributions have become a classical part of mathematical literature. His work covers wide areas of complex analysis and differential geometry. He began his research with a profound and original study of various problems in the theory of conformal mapping. His most significant contribution in this field was the introduction of infinitesimal and variational methods for univalent functions. ...»



Tammo TOM DIECK, Ian HAMBLETON. — **Surgery theory and geometry of representations.** — DMV Seminar, Band 11. — Un vol. broché,  $17 \times 24$ , de VII, 115 p. — Prix : Sfr. 39.00. — Birkhäuser, Basel, 1988.

These notes were prepared for the DMV-Seminar held in Düsseldorf from June 28 to July 5, 1987. The purpose of these notes is to describe simple examples in surgery theory — the basic tool for the investigation of differential and topological manifolds — and at the same time to give an introduction to some of the systemic parts of the theory.

Hans-Günther BIGALKE. — **Heinrich Heesch : Kristallgeometrie, Parkettierungen, Vierfarbenforschung.** — **Vita mathematica, Band 3.** — Un vol. relié,  $16 \times 23$ , de 319 p. — Prix : Sfr. 66.00. — Birkhäuser, Basel, 1988.

Der Mathematiker Heinrich Heesch hat vor allem durch seine Arbeiten zur Kristallgeometrie, zu Fragen der Parkettierungen der Ebene und zum Vierfarbenproblem Weltruf erlangt. Arbeit und Schicksal des Wissenschaftlers, der in den 30er Jahren als Assistent in Göttingen die letzte Hochblüte der «Göttinger Mathematik» und ihren von den Nationalsozialisten herbeigeführten Niedergang miterlebte, werden im vorliegenden Buch vorgestellt. Exemplarisch wird dabei deutlich, wie wissenschaftliche Ergebnisse von Weltgeltung zustande kommen können, welche Konflikte im Wissenschaftsbetrieb auftreten, wie sie gelöst werden oder auch ungelöst bleiben, und welche tragische Zuspitzung eine lebenslange wissenschaftliche Arbeit erfahren kann.

J.M.G. FELL, R.S. DORAN. — **Representations of \*-algebras, locally compact groups, and Banach \*-algebraic bundles. Vol. 1 : Basic representation theory of groups and algebras.** — Pure and applied mathematics, vol. 125. — Un vol. relié,  $16 \times 23,5$  de XVIII, 746 p. — Prix : \$99.00. — Academic Press, New York, 1988.

Preliminaries. Integration theory and Banach bundles. Locally compact groups. Algebraic representation theory. Locally convex representations and Banach algebras.  $C^*$ -algebras and their \*-representations. The topology of the space of \*-representations.

J.M.G. FELL, R.S. DORAN. — **Representations of \*-algebras, locally compact groups, and Banach \*-algebraic bundles. Vol. 2: Banach \*-algebraic bundles, induced representations, and the generalized Mackey analysis.** — Pure and applied mathematics, vol. 126. — Un vol. relié,  $16 \times 23,5$ , de VIII, p. 747-1486. — Prix : \$99.00. — Academic Press, New York, 1988.

Banach \*-algebraic bundles and their representations. Compact groups. Abelian groups and commutative Banach \*-algebraic bundles. Induced representations and the imprimitivity theorem. The generalized Mackey analysis.

**Applications of Fibonacci numbers.** — Proceedings of the second International Conference on Fibonacci Numbers and their Applications, San Jose State University, California, U.S.A., August 1986. — Edited by A.N. Philippou, A.F. Horadam and G.E. Bergum. — Un vol. relié,  $16,5 \times 24,5$ , de XX, 213 p. — Prix: Dfl. 1435.00. — Kluwer Academic Publishers/D. Reidel Publishing Company, Dordrecht, 1988.

The Fibonacci numbers appear in almost every branch of mathematics, such as number theory, differential equations, probability, statistics, numerical analysis, and linear algebra. They also occur in biology, chemistry, and electrical engineering. The contents of this book will prove useful to everyone interested in this important branch of mathematics. Its study will undoubtedly lead to additional results on Fibonacci numbers both in mathematics and its applications in science and engineering.

Hervé LEHNING. — **Analyse fonctionnelle: avec exercices.** — Mathématiques supérieures et spéciales, 5. — Un vol. broché,  $16 \times 24$ , de 246 p. — Prix: FF 99.00. — Masson, Paris, 1988.

Cet ouvrage est consacré à l'étude des fonctions définies comme sommes de séries entières ou de Fourier en particulier ou comme intégrales ainsi qu'à celle des espaces de fonctions et des équations différentielles. Les sujets exposés sont regroupés par types de concepts: continuité, dérivation, intégration, sommation, etc... Quand la résolution d'un problème nécessite la mise en oeuvre informatique d'un algorithme, le programme correspondant est décrit en français.

Philippe CAPERAA, Bernard VAN CUTSEM. — **Méthodes et modèles en statistique non paramétrique, t. 1: exposé fondamental.** — Un vol. broché,  $15,5 \times 24$ , de xvi, 358 p. Prix: FF 180.00. — Presses de l'Université, Laval, Québec, et Dunod, Paris, 1988.

Les auteurs présentent dans cet ouvrage les principaux modèles de la statistique non paramétrique: les statistiques d'ordre et leurs utilisations, les tests de rang et leurs applications, les test d'adéquation ... Pour chacun de ces domaines, les auteurs proposent une synthèse de l'état actuel des connaissances et mettent en évidence les techniques les plus utilisées. Des exemples issus de simulations servent d'illustrations à la plupart des notions présentées. Des énoncés d'exercices, dont les solutions seront données dans un autre volume (en préparation), complètent chaque chapitre.

M.M. STANISIC. — **The mathematical theory of turbulence.** — Second edition. — Universitext. — Un vol. broché,  $15,5 \times 23,5$ , de xviii, 501 p. — Prix: DM 88.00. — Springer-Verlag, New York, 1988.

The aim of this text is to give engineers and scientists a mathematical feeling for a subject which, because of its nonlinear character, has resisted mathematical analysis for many years. The reader will find that besides a systematic presentation of traditional knowledge of turbulence, the author has enhanced the extant literature with several unorthodox touches. In this new edition the fourth chapter on magnetohydrodynamic turbulence has been enlarged by adding new sections on the dispersion of temperature in magnetohydrodynamic turbulence from the Lagrange-Euler point of view. A new chapter has been added dealing with contemporary developments in theoretical and experimental turbulence.

**Selected papers on the teaching of mathematics as a service subject.** — Edited by R.R. Clements, P. Lauginie, E. de Turckheim. — International Centre for Mechanical Sciences courses and lectures, no. 305. — Un vol. broché,  $17 \times 23,5$ , de 180 p. — Prix: ÖS 392.00/DM 56.00. — Springer-Verlag, Wien, 1988.

*From the preface:* This study was the 3rd which the International Commission on Mathematical Instruction (ICMI) has mounted... Contributions to the discussion were received from many countries and these formed the basis of discussions at a Symposium held in Udine, Italy, from 6 to 10 April 1987. The first papers of this book describe the situation relating to service courses in a number of different countries. There then follows a selection of papers intended to illustrate aspects of the problem in more detail, and to describe some responses which have been made. Finally is reprinted the statement issued at the end of the Udine Meeting.

W.D. WALLIS. — **Combinatorial designs.** — Pure and applied mathematics, vol. 118. — Un vol. relié,  $16 \times 23,5$ , de vii, 329 p. — Prix: \$89.75 (U.S.A. et Canada), \$107.50 (tous les autres pays). — Marcel Dekker, Inc., New York, 1988.

Basic concepts. — Balanced designs. — Some finite algebra. — Difference sets and difference methods. — Finite geometries. — More about block designs. — t-designs. —

Hadamard matrices. — The variability of Hadamard matrices. — Latin squares. — One-factors and one-factorizations. — Triple systems. — Room squares. — Asymptotic results on balanced incomplete block designs.

**Superstrings: a theory of everything?** — Edited by P.C.W. Davies, Julian Brown. — Un vol. broché, 14 × 21,5, de VIII, 234 p. — Prix: £6.95, (relié: £20.00). — Cambridge University Press, Cambridge, 1988.

Superstring theory is currently the most exciting and actively pursued branch of physics. If successful, this theory would provide the complete unification of physics, the so-called «theory of everything». The excitement surrounding these developments prompted BBC Radio to broadcast a Radio 3 documentary, including interviews. This book is based on the original transcripts of these interviews. It contains a clear and concise introduction to superstring theory in nonmathematical terms.

**Mathematics from manuscript to print, 1300-1600.** — Edited by Cynthia Hay. — Oxford science publications. — Un vol. relié, 16 × 24, de VIII, 273 p. — Prix: £35.00. — Clarendon Press, Oxford, 1988.

This volume records the proceedings of a joint conference of the British Society for the History of Mathematics and the Open University on Renaissance Mathematics, held at Keble College, Oxford, September 27-30, 1984. — *Contents:* Italian and Provençal mathematics. Nicolas Chuquet and French mathematics. Mathematics in the 16th century. Mathematics and its ramifications.

**Nonlinear analysis.** — Editor, Th.M. Rassias. — Un vol. relié, 16 × 22, de XI, 557 p. — Prix: £43.90. — World Scientific Publishing Co., Singapore, distributed by John Wiley and Sons, Chichester, 1988.

This volume explores some of the interconnections and interrelations between topology and analysis with a major emphasis on the study of applications of topological methods, fixed point theory, bifurcation theory, and the stability of mappings. It contains selected papers by leading experts in nonlinear analysis problems and related subjects.

Subhashis NAG. — **The complex analytic theory of Teichmüller spaces.** — Canadian Mathematical Society series of monographs and advanced texts. — Un vol. relié, 17 × 24, de XII, 427 p. — Prix: 47.50. — John Wiley and Sons, New York, 1988.

A portmanteau of preliminaries. — the moduli spaces for Riemann surfaces. — The complex structure of Teichmüller spaces. — More about the complex structure of Teichmüller spaces. — The universal family and its universal property. — Appendix: Invariant metrics on moduli spaces.

E.J. HANNAN, Manfred DEISTLER. — **The statistical theory of linear systems.** — Wiley series in probability and mathematical statistics. — Un vol. relié, 16 × 23,5, de XIII, 380 p. — Prix: £36.95. — John Wiley and Sons, New York, 1988.

This book brings together the recent developments in the theory and applications of systems identification in a comprehensive and integrated treatment. The coverage focuses on the stationary case and the case of noise-free inputs. Topics discussed include: the relation between linear system representations, the structure of stationary time series, the structure theory for linear systems, the description of systems in local coordinates, topological and geometrical

structure, asymptotic theory for maximum likelihood estimators, estimation of the integer parameters specifying the order, and off-line algorithms and important on-line algorithms.

**Advances in science of China: Mathematics, vol. 1.** — Edited by Gu Chaohao, Wang Yuan. — Un vol. broché,  $19 \times 26$ , de 223 p. — Prix: \$ 17.50. — Science Press, Beijing and John Wiley and Sons, New York, 1986.

*Chen Xiru*: Large sample statistics in China: a review of some. — *Gong Sheng, Shixiong, Zheng Xuean*: Harmonic analysis on classical groups. — *Gu Chaohao, Hu Hesheng*: On some developments of harmonic maps. — *Li Daqian, Chen Shuxing*: Regularity and singularity of solutions for nonlinear hyperbolic equations. — *Wang Yuan, Wang Lianxiang*: Diophantine approximations in China. — *Wu Wentsün*: A report on mechanical theorem proving and mechanical theorem discovering in geometries. — *Yang Le*: Some results on value distribution theory on entire and meromorphic functions.

William C. BROWN. — **A second course in linear algebra.** — Un vol. relié,  $17 \times 24$ , de x, 264 p. — Prix: 30.50. — John Wiley and Sons, New York, 1988.

This text is aimed at seniors and beginning graduate students who have had at least one course in linear algebra. It is assumed that the reader is familiar with functions, matrices, determinants, and elementary set theory. — *Contents*: Linear algebra. Multilinear algebra. Canonical forms of matrices. Normed linear vector spaces. Inner product spaces.

**Mathematics as a service subject.** — Edited by A.G. Howson, J.-P. Kahane, P. Lauginie, E. de Turckheim. — ICMI study series. — Un vol. broché,  $17 \times 24,5$ , de 89 p. — Prix: 6.95 (relié: \$ 20.00). — Cambridge University Press, Cambridge, 1988.

This volume is based on the conference held by the International Commission on Mathematical Instruction at Udine in April 1987. It consists of a number of key papers presented by international authorities on the role of mathematics in applied subjects, such as engineering, computer science and mathematical modelling. The importance of certain mathematical ideas, such as geometry and discrete mathematics, is stressed, in addition to the more classical methods.

André GRAMAIN. — **Intégration.** — Collection «Méthodes». — Un vol. broché,  $15,5 \times 22$ , de VII, 226 p. — Prix: FF 160.00. — Hermann, Paris, 1988.

Cet ouvrage adopte le point de vue pragmatique et puise dans chaque théorie ou développements de l'analyse ce qui peut être utile à la compréhension et à la maîtrise de l'intégration. Le lecteur se familiarise successivement avec les règles de calcul, avec les questions de limites, puis avec l'aspect théorique de l'intégration abstraite, pour se trouver enfin confronté aux espaces fonctionnels. Les exercices sont des applications directes ou des compléments des chapitres.

Philip J. DAVIS, Reuben HERSH. — **L'empire mathématique.** — Traduit de l'américain par Jean-Baptiste Grasset. — Un vol. relié,  $18 \times 26$ , de xvi, 335 p. — Prix: FF 240.00. — Gauthier-Villars, Paris, 1988.

On peut aimer les mathématiques et douter de l'utilisation qu'en font les professionnels des autres disciplines: en moins de trente ans le monde est devenu un véritable empire mathématique. Des sciences physiques, à l'économie, à la sociologie, à la politique, au droit et à la médecine..., le langage et les raisonnements mathématiques ont su se rendre partout indispensables. Les auteurs prennent ici le contrepied des idées reçues dans ce domaine. Ils montrent que toute domination intellectuelle est pernicieuse ... et que même les mathématiciens devraient combattre

l'impérialisme de leur discipline. Ce livre, stimulant, érudit et plein d'humour, passionnera tous ceux qui pensent que les mathématiques ne méritent ni l'excès d'honneur qui leur est fait, ni l'indignité que les ignorants voudraient leur attribuer.

Robert CARROLL. — **Mathematical physics.** — North-Holland mathematics studies, vol. 152. — Notas de matematica, vol. 121. — Un vol. relié,  $16,5 \times 24$ , de x, 399 p. — Prix: Dfl. 180.00. — North-Holland, Amsterdam, 1988.

All of the necessary functional analysis and differential geometry is included, along with basic calculus of variations and partial differential equations (linear and nonlinear). An introduction to classical and quantum mechanics is given with topics in Feynman integrals, gauge fields, geometric quantization, attractors for PDE, Ginzburg-Landau equations in superconductivity, Navier-Stokes equations, soliton theory, inverse problems and ill-posed problems, scattering theory, convex analysis, variational inequalities, nonlinear semigroups, etc...

Peter IMKELLER. — **Two-parameter martingales and their quadratic variation.** — Lecture notes in mathematics, vol. 1308. — Un vol. broché,  $16,5 \times 24$ , de iv, 177 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1988.

This book has two-fold aims. In a first part it gives an introductory, thorough and essentially self-contained treatment of the general theory of two parameter processes that has developed since 1975. The second part presents the results of recent research by the author on martingale theory and stochastic calculus for two-parameter processes. Both results and methods are almost entirely new and provide the fundamentals of a general stochastic analysis of two-parameter processes including, in particular, so far inaccessible jump phenomena.

Bernold FIEDLER. — **Global bifurcation of periodic solutions with symmetry.** — Lecture notes in mathematics, vol. 1309. — Un vol. broché,  $16,5 \times 24$ , de viii, 144 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1988.

Within a global approach, the emphasis is on periodic motions far from equilibrium. Mathematical methods include bifurcation theory, transversality theory, and generic approximations. A new homotopic invariant is designed to study the global interdependence of symmetric periodic motions. Results are illustrated by a variety of applications including coupled oscillators and rotating waves.

Olav Arninn LAUDAL. — **Local moduli and singularities.** — Lecture notes in mathematics, vol. 1310. — Un vol. broché,  $16,5 \times 24$ , de v, 117 p. — Prix: DM 23.00. — Springer-Verlag, Berlin, 1988.

This research monograph sets out to study the notion of a local moduli suite of algebraic objects like schemes, singularities or Lie algebras and provides a framework for this. The basic idea is to work with the action of the kernel of the Kodaira-Spencer map, on the base space of a versal family. The main results are the existence, in a general context, of a local moduli suite in the category of algebraic spaces, and the proof that, generically, this moduli suite is the quotient of a canonical filtration of the base space of the versal family by the action of the Kodaira-Spencer kernel.

**Algebraic geometry, Sundance, 1986. Proceedings of a conference held at Sundance, Utah, August 12-19, 1986.** — Edited by A. Holme, R. Speiser. — Lecture notes in mathematics, vol. 1311. — Un vol. broché,  $16,5 \times 24$ , de vi, 320 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1988.



This volume presents selected papers resulting from the meeting at Sundance on enumerative algebraic geometry. The papers are original research articles and concentrate on the underlying geometry of the subject.

Nikolai A. SHIROKOV. — **Analytic functions smooth up to the boundary.** — Lecture notes in mathematics, vol. 1312. — Un vol. broché, 16,5 × 24, de III, 213 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1988.

This research monograph concerns the Nevanlinna factorization of analytic functions smooth up to the boundary. The peculiar properties of such a factorization are investigated for the most common classes of Lipschitz-like analytic functions. The book sets out to create a satisfactory factorization theory as exists for Hardy classes. The reader will find, among other things, the theorem on smoothness for the outer part of a function, the generalization of the theorem of V.P. Havin and F.A. Shamoyan also known in the mathematical lore as the unpublished Carleson-Jacobs theorem, etc...

Fritz COLONIUS. — **Optimal periodic control.** — Lecture notes in mathematics, vol. 1313. — Un vol. broché, 16,5 × 24, de VI, 177 p. — Prix: DM 28.50. — Springer-Verlag, Berlin, 1988.

This research monograph deals with optimal periodic control problems for systems governed by ordinary and functional differential equations of retarded type. Particular attention is given to the problem of local properness, i.e. whether system performance can be improved by introducing periodic motions. The book provides mathematically rigorous proofs for results which are potentially of importance in chemical engineering and aerospace engineering.

Akito FUTAKI. — **Kähler-Einstein metrics and integral invariants.** — Lecture notes in mathematics, vol. 1314. — Un vol. broché, 16,5 × 24, de IV, 140 p. — Prix: DM 23.00. — Springer-Verlag, Berlin, 1988.

These notes present very recent results on compact Kähler-Einstein manifolds of positive scalar curvature. A central role is played here by a Lie algebra character of the complex Lie algebra consisting of all holomorphic vector fields, which can be intrinsically defined on any compact complex manifold and becomes an obstruction to the existence of a Kähler-Einstein metric. Other related topics such as extremal Kähler metrics studied by Calabi and others and the existence results of Tian and Yau are also reviewed.

Robert A. McCOY, Ibula NTANTU. — **Topological properties of spaces of continuous functions.** — Lecture notes in mathematics, vol. 1315. — Un vol. broché, 16,5 × 24, de IV, 124 p. — Prix: DM 23.00. — Springer-Verlag, Berlin, 1988.

This book brings together into a general setting various techniques in the study of the topological properties of spaces of continuous functions. The two major classes of function space topologies studied are the set-open topologies and the uniform topologies. Exercises are included at the end of each chapter, covering other kinds of function space topologies.

**Stochastic analysis and related topics.** — Proceedings of a workshop held in Silivri, Turkey, July 7-9, 1966. — Edited by H. Korezlioglu, A.S. Ustunel. — Lecture notes in mathematics, vol. 1316. — Un vol. broché, 16,5 × 24, de V, 371 p. — Prix: DM 57.50. — Springer-Verlag, Berlin, 1988.

The Silivri workshop was divided into a short summer school and a working conference, producing lectures and research papers on recent developments in stochastic analysis on Wiener

space. The topics treated in the lectures relate to the Malliavin calculus, the Skorohod integral and nonlinear functionals of white noise.

**Geometric aspects of functional analysis.** — Israel Seminar (GAFA), 1986-87. — Edited by J. Lindenstrauss, V.D. Milman. — Lecture notes in mathematics, vol. 1317. — Un vol. broché,  $16,5 \times 24$ , de VII, 289 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1988.

The large majority of the papers in this volume are original research papers. There was last year a strong emphasis on classical finite-dimensional convexity theory and its connection with Banach space theory. In recent years, it has become evident that the notions and results of the local theory of Banach spaces are useful in solving classical questions in convexity theory. The present volume contributes to clarifying this point. In addition this volume contains basic contributions to ergodic theory, invariant subspace theory and qualitative differential geometry.

**Algebraic topology, rational homotopy.** — Proceedings of a Conference held in Louvain-la-Neuve, Belgium, May 2-6, 1986. — Edited by Y. Felix. — Lecture notes in mathematics, vol. 1318. — Un vol. broché,  $16,5 \times 24$ , de VIII, 245 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1988.

This proceedings volume centers on new developments in rational homotopy and on their influence on algebra and algebraic topology. Most of the papers are original research papers dealing with rational homotopy and tame homotopy, cyclic homology, Moore conjectures on the exponents of the homotopy groups of a finite CW-c-complex and homology of loop spaces. Of particular interest for specialists are papers on construction of the minimal model in tame theory and computation of the Lusternik-Schnirelmann category, on tame homotopy and on the properties of Poincaré series of loop spaces.

Matti VUORINEN. — **Conformal geometry and quasiregular mappings. Lecture notes in mathematics, vol. 1319.** — Un vol. broché,  $16,5 \times 24$ , de XIX, 209 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1988.

This book is an introduction to the theory of spatial quasiregular mappings intended for the uninitiated reader. At the same time the book also addresses specialists in classical analysis and, in particular, geometric function theory. The text leads the reader to the frontier of current research and covers some most recent developments in the subject, previously scattered through the literature.

**Semigroups : theory and applications.** — Proceedings of a Conference held in Oberwolfach, FRG, Feb. 23 — Mar. 1, 1986. — Edited by H. Jürgensen, G. Lallement, H.J. Weinert. — Lecture notes in mathematics, vol. 1320. — Un vol. broché,  $16,5 \times 24$ , de X, 416 p. — Prix: DM 65.00. — Springer-Verlag, Berlin, 1988.

This conference was the third conference on semigroups held at Oberwolfach, this time with an emphasis on combinatorial semigroups and their applications. The conference program included 42 lectures, most of which are presented in this volume. topics covered are: congruences, varieties and pseudovarieties, languages, presentations, equations in free monoids, inverse semigroups and generalizations, semigroups of endomorphisms, semigroups and their algebraic structures.

**Séminaire de probabilités XXII.** — Edité par J. Azéma, P.A. Meyer et M. Yor. — Lecture notes in mathematics, vol. 1321. — Un vol. broché,  $16,5 \times 24$ , de IV, 600 p. — Prix: DM 98.00. — Springer-Verlag, Berlin, 1988.

This new volume of the Séminaire de probabilités is mainly devoted to the studies of semimartingales of their associated stochastic integrals, and of stochastic differential equations, with some emphasis on applications to the study of diffusions, and in particular Brownian motion.

Douglas R. ANDERSON, Hans J. MUNKHOLM. — **Boundedly controlled topology : foundations of algebraic topology and simple homotopy theory.** — Lecture notes in mathematics, vol. 1323. — Un vol. broché, 16,45 × 24, de XII, 309 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1988.

Several recent investigations have focused attention on spaces and manifolds which are non-compact but where the problems studied have some kind of «control near infinity». This monograph introduces the category of spaces that are «boundedly controlled» over the (usually non-compact) metric space  $Z$ . It sets out to develop the algebraic and geometric tools needed to formulate and to prove boundedly controlled analogues on many of the standard results of algebraic topology and simple homotopy theory.

V.I. ARNOLD. — **Geometrical methods in the theory of ordinary differential equations.** — 2nd edition. — Translated by Joseph Szücs. — English translation edited by Mark Levi. — Grundlehren der mathematischen Wissenschaften, Bd. 250. — Un vol. relié, 16 × 24, de XIII, 351 p. — Prix: DM 128.00. — Springer-Verlag, New York, 1988.

Since the first edition of this book, some progress in the theory of ordinary differential equations have been made partly with the help of computers. Much of this progress is represented in this revised edition, including such topics as the Feigenbaum universality of period doubling, the Zoladec solution, the Iljashenko proof, the Ecalle and Voronin theory, the Varchenko and Hovanski theorems, and the Neistadt theory.

Yuri I. MANIN. — **Gauge field theory and complex geometry.** — Translated from the Russian by N. Koblitz and J.R. King. — Grundlehren der mathematischen Wissenschaften, Bd. 289. — Un vol. relié, 16 × 24, de x, 297 p. — Prix: DM 154.00. — Springer-Verlag, New York, 1988.

Introduction: Geometrical structures in field theory. — Grassmannians, connections, and integrability. — The Radon-Penrose transform. — Introduction to superalgebra. — Introduction to supergeometry. — Geometric structures of supersymmetry and gravitation.

M. HERMANN, S. IKEDA, U. ORBANZ. — **Equimultiplicity and blowing up : an algebraic study.** — With an appendix by B. Moonen. — Un vol. relié, 17 × 25, de xvii, 629 p. — Prix: DM 164.00. — Springer-Verlag, Berlin, 1988.

This research monograph deals with two main subjects, namely the notion of equimultiplicity and the algebraic study of various graded rings in relation to blowing ups. Both subjects are clearly motivated by their use in resolving singularities of algebraic varieties, for which one of the main tools consists in blowing up the variety along an equimultiple subvariety. For equimultiplicity a unified and self-contained treatment of earlier results is given. For blowing up, new results are presented on the connection with generalized Cohen-Macaulay rings. The appendix provides a geometric interpretation of equimultiple ideals in complex-analytic geometry.

H.B. KELLER. — **Lectures on numerical methods in bifurcation problems.** — Tata Institute lectures on mathematics, vol. 79. — Un vol. broché, 17 × 24, de iv, 160 p. — Prix: DM 20.00. — Springer-Verlag, Berlin, 1987.

These lectures introduce the modern theory and practical numerical methods for continuation of solutions of nonlinear problems depending upon parameters. Bifurcations are one of the



many types of singularities that occur along such solution paths and their computation and methods for switching branches are treated. The treatment is elementary and basic.

D.L. McLEISH, Christopher G. SMALL. — **The theory and applications of statistical inference functions.** — Lecture notes in statistics, vol. 44. — Un vol. broché,  $16,5 \times 24$ , de vi, 124 p. — Prix : DM 28.50. — Springer-Verlag, New York, 1988.

This monograph develops an approach to statistical inference that is both comprehensive in its treatment of statistical principles and sufficiently powerful to be applicable to a variety of important practical problems, such as inference for stochastic processes and classes of estimating functions. Some of the consequences of extending standard concepts of ancillarity, sufficiency and completeness are examined in this setting.

Alfred FRÖLICHER, Andreas KRIEGL. — **Linear spaces and differentiation theory.** — Pure and applied mathematics. — Un vol. relié,  $16 \times 24$ , de xvi, 246 p. — Prix: £29.95. — John Wiley and Sons, Chichester, 1988.

The main subject of this book is differentiation in linear spaces of arbitrary dimension, infinite-dimensional spaces appear in particular as function spaces. Since many of these are not normable, the class of Banach spaces used in classical calculus is replaced by a bigger class of linear spaces. One of the crucial results states that  $k$ -fold differentiability together with a suitable (Lipschitz) condition on the derivatives can be reduced from general maps to functions of one variable by composing with curves in the domain and (linear) functions on the range. The theory described in this book provides a new basis for the extension of differential calculus to infinite-dimensional spaces, and for variational calculus.

Manfred KRACHT, Erwin KREYSZIG. — **Methods of complex analysis in partial differential equations with applications.** — Canadian Mathematical Society series of monographs and advanced texts. — Un vol. relié,  $16,5 \times 24$ , de xiv, 394 p. — Prix: £47.50. — John Wiley and Sons, Chichester, 1988.

Introduction. — Bergman operators: general theory. — Integral operators with polynomials kernels and differential operators. — Polynomial kernels: existence and construction. — Further closed-form kernels. — Riemann-Vekua representation and further methods related to Bergman kernels. Determination of Riemann functions. — Coefficient problem and singularities of solutions. — Approximation of solutions. — Value distribution theory of solutions. — Applications of class P operators. Function theory of the Bauer-Peschl equation. — Application to compressible fluid flow. — Integral operators applied to transonic flow. Tricomi equation.

Stanislas LOJASIEWICZ. — **An introduction to the theory of real functions.** — Translated by G.H. Lawden. — Edited by A.V. Ferreira. — Un vol. relié,  $16 \times 23,5$ , de ix, 230 p. — Prix: £24.95. — John Wiley and Sons, Chichester, 1988.

This book is a detailed and thorough introduction to classical real analysis. It covers both elementary and advanced material, including a number of topics not normally found in books at this level. Examples are Helly's theorems on sequences of monotone functions, Tonelli polynomials, Bernstein polynomials and absolutely monotone functions, and the theorems of Rademacher and Stepanov on differentiability of Lipschitz continuous functions.

**Topics in operator theory : Constantin Apostol memorial issue.** — Edited by I. Gohberg. — Operator theory, vol. 32. — Un vol. relié,  $17 \times 24$ , de vii, 274 p. — Prix: SFR 88.00. — Birkhäuser Verlag, Basel, 1988.

Constantin Apostol was an outstanding expert in operator theory, in which area he made important and far-reaching contributions. The volume opens with a memorial paper written by D. Herrero, and then gives a list of the publications of C. Apostol and the text of his last paper. The papers which follow comprise a representative sample of many of the important problems in operator theory which are currently under active investigation. The range of topics include invariant subspaces, algebras of operators, spectral problems, Fredholm operators, extremal points, and interpolation problems.

**Topics in interpolation theory of rational matrix-valued functions.** — Edited by I. Gohberg. — Operator theory, vol. 33. — Un vol. relié,  $17 \times 24$ , de ix, 247 p. — Prix: Sfr. 82.00. — Birkhäuser-Verlag, Basel, 1988.

This volume contains six papers which treat systematically several interpolation problems for rational matrix functions. The majority of these papers are concerned with different aspects of the basic problem of constructing a rational matrix function with a prescribed null (zero) and pole structure and its applications. The realization approach which comes from system theory and control is used in all papers and serves as a tool to reduce problems of rational matrix functions to problems of linear operators. This approach also enables the considered interpolation problems to be solved explicitly. The volume has a strong control theory slant and all papers are connected with problems in system or network theory.

Joseph AUSLANDER. — **Minimal flows and their extensions.** — North-Holland mathematics studies, vol. 153. — Notas de matematica, vol. 122. — Un vol. relié,  $16,5 \times 24$ , de xi, 265 p. — Prix: Dfl. 165.00. — North-Holland, Amsterdam, 1988.

This monograph presents some developments in the abstract theory of topological dynamics. It concentrates on the internal structure of minimal flows (actions of groups on compact Hausdorff spaces for which every orbit is dense) and their homomorphisms (Continuous equivariant maps). Among the topics unique to this book are a proof of the Ellis «joint continuous theorem», a characterization of the equicontinuous structure relation, and the structure theorem for minimal flows.

V.S. VLADIMIROV, Yu. N. DROZZINOV, and B.I. ZAVIALOV. — **Tauberian theorems for generalized functions.** — Mathematics and its applications (Soviet series). — Un vol. relié,  $17 \times 24,5$ , de xv, 293 p. — Prix: Dfl. 185.00. — Kluwer Academic Publishers, Dordrecht, 1988.

The needs of modern mathematical physics have made necessary to develop Tauberian theory for distributions depending on several variables. The notion of quasi-asymptotics of distributions is a very useful tool for formulation and study of asymptotic properties of distributions. This notion is used extensively throughout the book. Applications of results obtained in mathematical physics, partial differential equations and quantum field theory are presented.

W.I. FUSHCHICH, and A.G. NIKITIN. — **Symmetries of Maxwell's equations.** — Translated by John R. Schulenberger. — Mathematics and its applications (Soviet series). — Un vol. relié,  $24,5 \times 17$ , de xiv, 214 p. — Prix: Dfl. 160.00. — D. Reidel Publishing Company, a member of the Kluwer Academic Publishers Group, Dordrecht, 1987.

This monograph is devoted to a description of symmetry properties of the Maxwell, Dirac, and Kemmer-Duffin-Petiau equations as well as other equations encountered in relativistic quantum theory. A new approach to the investigation of symmetry of partial differential equations and various applications of this approach are expounded.

Daniel LEHMANN, Rudolphe BKOUCHE. — **Initiation à la géométrie.** — Appendice historique de Rudolphe Bkouche. — Collection «Mathématiques». — Un vol. broché, 15 × 22, de 500 p. — Prix: FF 280.00. — Presses universitaires de France, Paris, 1988.

Les deux premières parties de ce livre reprennent l'étude naïve de figures et de transformations autrefois bien connues. On sait aujourd'hui que les propriétés de celles-ci ne sont en effet que des conséquences plus ou moins triviales de grandes théories générales, telles l'algèbre linéaire, la théorie des groupes et la classification des géométries. Ces théories, abordées en troisième partie, sont de puissants outils permettant de mieux comprendre, d'aller plus vite et d'aller plus loin. Ce livre est destiné surtout à la formation en géométrie, tant initiale que continue, des professeurs de mathématiques.

**Biomathematics and related computational problems.** — Edited by Luigi M. Ricciardi. — Un vol. relié, 17 × 24,5, de xxv, 733 p. — Prix: Dfl. 295.00. — Kluwer Academic Publishers, Dordrecht, 1988.

This volume draws together a collection of research studies in modern biomathematics selected among those presented at the International workshop held at Naples and Anacapri in May 1987. Treatments range from mathematical to experimental topics in the following domains : Neurosciences and related problems, population theories (ecology, dynamics and morphogenesis and pattern formation, theoretical and computational methods, biological, chemical and physical systems.

M. METIVIER, S. WATANABE (eds.) — **Stochastic analysis : proceedings of the Japanese-French Seminar held in Paris, France, June 16-19, 1987.** — Lecture notes in mathematics, vol. 1322. — Un vol. broché, 16,5 × 24,5 de vii, 197 p. — Prix : DM 35.00. — Springer-Verlag, Berlin, 1988.

As a project of the France-Japan Cooperative Science Program a joint seminar on probability theory was held at Ecole Normale Supérieure in Paris. The main theme was stochastic analysis and applications to large scale systems. Nineteen lectures were presented on various topics like the Malliavin calculus, infinite dimensional stochastic differential equations and stochastic partial differential equations, limit theorems for particle systems, etc. The present volume is devoted to the original papers presented by the participants.

F. LIRET, M. ZISMAN. — **Maths. Tomes 4 et 5.** — 2 vol. brochés, 15,5 × 24, de 249 p. et de p. 250-512. — Dunod, Paris, 1988.

Les tomes 4 et 5 couvrent le programme du second semestre de la 2ème année [universitaire]. Le tome 4 contient 29 leçons, le tome 5 en contient 32.

Philippe DESCHAMPS. — **Cours de mathématiques pour économistes : manuel de 1er cycle.** — Economie : «module». — Un vol. broché, 15,5 × 24, de xii, 185 p. — Dunod, Paris, 1988.

Cet ouvrage présente l'essentiel des connaissances mathématiques dont l'acquisition est indispensable pour les étudiants de premier cycle en économie. Il traite successivement de la logique formelle, de la théorie des ensembles, de l'algèbre des matrices, de la topologie, du calcul différentiel et intégral et de la théorie de l'optimisation.

**Ramanujan revisited: proceedings of the Centenary conference, University of Illinois at Urbana-Champaign, June 1-5, 1987.** — Ed. by George E. Andrews, Richard A. Askey, Bruce C. Berndt, K.G. Ramanathan, Robert A. Rankin. — Un vol. relié, 15,5 × 23,5 de xx, 609 p. — Prix: US\$ 49.50. — Academic Press, Boston, 1988.

Srinivasa Ramanujan was India's most famous mathematician. On the hundredth anniversary of his birth his astounding mathematical discoveries are still a source of inspiration to many mathematicians working in number theory, analysis, and combinatorics as well as to some physicists. Twenty-eight eminent speakers presented expository talks on topics ranging from Ramanujan's theorems, problems and conjectures to comments on his notebooks, letters, and unpublished manuscripts.

Jerrold E. MARSDEN; Anthony J. TROMBA. — **Vector calculus**. — Third edition. — Un vol. relié,  $17 \times 24$ , de XIV, 655 p. — Prix: 29.95. — W.H. Freeman, New York, 1988.

Contents: The geometry of Euclidean space. Differentiation. Vector-valued functions. Higher-order derivatives: maxima and minima. Double integrals. The triple integral, the change of variables formula, and applications. Integrals over paths and surfaces. The integral theorems of vector analysis.

Gerhard MAESS. — **Vorlesungen über numerische Mathematik, II: Analysis**. — Un vol. relié,  $17,5 \times 24,5$  de 327 p. — Prix: Sfr. 50.00. — Birkhäuser, Basel, 1988.

Inhalt: Nichtlineare Gleichungen und Gleichungssysteme. Interpolation und Approximation. Quadratur und Kubatur. Anfangswertaufgaben für gewöhnliche Differentialgleichungen.

V.I. ARNOL'D. — **Mathematische Methoden der klassischen Mechanik**. — Un vol. relié,  $17 \times 13,5$  de 520 p. — Prix: Sfr. 66.00. — Birkhäuser Verlag, Basel, 1988.

Das vorliegende Buch nimmt in der mathematischen und physikalischen Weltliteratur eine Sonderstellung ein. Es behandelt weite Partien der klassischen Mechanik vom Standpunkt und mit den Methoden eines theoretischen Mathematikers. Der Autor benutzt einen intuitiven Stil und konzentriert sich auf das inhaltliche Verständnis, und es gelingt ihm, eine enorme Stofffülle auf beschränktem Platz unterzubringen. Zahlreiche Beispiele und interessante Aufgaben runden den dargebotenen Stoff ab.

**Contributions to operator theory and its applications: proceedings of the conference on operator theory and functional analysis, Mesa, Arizona, June 11-14, 1987**. — Ed. by I. Gohberg, J.W. Helton, L. Rodman. — Operator theory: advances and applications, vol. 35. — Un vol. relié,  $17 \times 24$ , de VII, 530 p. — Prix: Sfr. 134.00. — Birkhäuser, Basel, 1988.

The lectures held at this conference reviewed recent advances in operator theory and its applications, with some emphasis on system theory. They presented a cross-section of the theoretical developments in abstract operator theory as well as in studies of concrete classes of operators. The applications are related to differential and integral operators, Toeplitz and Hankel operators and matrices.

**Orthogonal matrix-valued polynomials and applications: seminar on operator theory at the School of Mathematical Sciences, Tel Aviv University**. — Operator theory: advances and applications, vol. 34. — Un vol. relié,  $17 \times 24$ , de IX, 214 p. — Prix: Sfr. 78.00. — Birkhäuser, Basel, 1988.

This book consists of six papers on the theory of matrix polynomials which are orthogonal on the unit circle with respect to an indefinite matrix weight, and a number of related topics including nonstationary analogues, reproducing kernel spaces and interpolation problems. Most of the papers deal with generalizations of a pair of theorems of M.G. Krein on the distribution of the roots of orthogonal scalar polynomials from different points of view.

Jacobus H. VAN LINT; Gerard VAN DER GEER. — **Introduction to coding theory and algebraic geometry.** — DMV Seminar, Band 12. — Un vol. relié,  $17 \times 24$ , de 83 p. — Prix: Sfr. 24.80. — Birkhäuser Verlag, Basel, 1988.

In 1982, Tsfasman, Vladut and Zink, using algebraic geometry and ideas of Goppa, constructed a sequence of codes that exceed the Gilbert-Varshamov bound. The result was considered sensational. Furthermore it was surprising to see these unrelated areas of mathematics collaborating. The aim of this course is to give an introduction to coding theory and to sketch the ideas of algebraic geometry that led to the new result.

**Numerical integration III: proceedings of the Conference held at the Mathematisches Forschungsinstitut, Oberwolfach, Nov. 8-14, 1987.** — By H. Brass, G. Hämmerlin. — International series of numerical mathematics, vol. 85. — Un vol. relié,  $17 \times 24$ , de xiv, 325 p. — Prix: Sfr. 82.00. — Birkhäuser Verlag, Basel, 1988.

This volume contains 28 papers read at the conference, and gives some insight into the variety of problems in the field of numerical treatment of integrals. Practical methods include quasi Monte-Carlo methods and procedures using transformation of the integrand; strongly oscillating integrands, in particular for infinite intervals, and divergent integrals of different types are also considered.

A.S. TROELSTRA; D. VAN DALEN. — **Constructivism in mathematics: an introduction. Vol. 1.** — Studies in logic and the foundations of mathematics, vol. 121. — Un vol. broché,  $15 \times 22,5$ , de xx, 342 p., xiv. — Prix: US\$ 86.75 (relié)/US\$ 33.00 (broché). — North-Holland, Amsterdam, 1988.

This work in 2 volumes (vol. 2 is to appear shortly) covers the principal approaches to constructivism in mathematics. They present a thorough, up-to-date introduction to the metamathematics of constructive mathematics, paying special attention to intuitionism, Markov's constructivism and Martin-Löf's type theory with its operational semantics. A detailed exposition of the basic features of constructive mathematics, with illustrations from analysis, algebra and topology, is provided, with due attention to the metamathematical aspects.

**Algebraic, extremal and metric combinatorics, 1986.** — Ed. by M.M. Deza, P. Frankl and I.G. Rosenberg. — London Mathematical Society Lecture Note Series, vol. 131. — Un vol. broché,  $15 \times 22,5$ , de ix, 245 p. — Prix: £20.00/US\$ 34.50. — Cambridge University Press, Cambridge, 1988.

Topics covered in this book include association schemes, extremal problems, combinatorial geometries and matroids, and designs. All the papers contain new results and many are extensive surveys of particular areas of research. Particularly valuable will be Ivanov's paper on recent Soviet research in these areas.

Mohan S. PUTCHA. — **Linear algebraic monoids.** — London Mathematical Society Lecture Note Series, vol. 133. — Un vol. broché,  $15 \times 12,5$ , de x, 171 p. — Prix: £15.00/US\$ 24.95. — Cambridge University Press, Cambridge, 1988.

The new field of linear algebraic monoids represents a synthesis of ideas from the theory of algebraic groups, algebraic geometry, matrix theory and abstract semigroup theory. Since every representation of an algebraic group gives rise to an algebraic monoid, the objects of study do indeed arise naturally. The basic results in the subject have now been obtained and these are presented in this book.



Henry C. TUCKWELL. — **Elementary applications of probability theory.** — Un volume broché, 15,5 × 23,5, de XIII, 225 p. — Prix: £10.95. — Chapman and Hall, London, 1988.

This introduction to applications of probability theory draws examples mainly in the biological sciences and engineering. This treatment of one of the most vigorous areas of research provides a basis for more advanced work and also an introduction to the many powerful techniques for modern applications of probability theory.

Witold WIESLAW. — **Topological fields.** — Monographs and textbooks in pure and applied mathematics, vol. 119. — Un vol. relié, 16 × 23,5, de VII, 309 p. — Prix: US\$119.50. — Marcel Dekker, New York, 1988.

Beginning with the fundamental principles of topological algebra complete with numerous examples, this text surveys a broad array of pertinent subjects including properties of absolute-valued fields, properties and characterization of normed fields, Krull valuations, topologies of type V, locally compact fields, connected fields, extensions of topologies, and much more.

Hans-Otto GEORGII. — **Gibbs measures and phase transitions.** — De Gruyter studies in mathematics; vol. 9. — Un vol. relié, 17,5 × 24,5, de XIV, 525 p. — Prix: DM 178.00. — Walter de Gruyter, Berlin, 1988.

This book deals with systems of infinitely many random variables attached to the vertices of a multi-dimensional lattice and depending on each other according to their positions. The theory of such «spatial random systems with interaction» is a rapidly growing branch of probability theory developed with the goal of understanding the cooperative effects in large random systems.

George L. NEMHAUSER; Laurence A. WOLSEY. — **Integer and combinatorial optimization.** — Wiley-Interscience series in discrete mathematics and optimization. — Un vol. relié, 18,5 × 26, de XIV, 763 p. — Prix: £70.00. — John Wiley and Sons, New York, 1988.

This work presents the mathematical foundations, theory and algorithms of discrete optimization methods, incorporating many recently developed techniques. Problem formulation demonstrates the scope of applications and is of central importance to solving the optimization model.

J.L. BELL. — **Toposes and local set theories: an introduction.** — Oxford logic guides, vol. 14. — Un vol. relié, 16 × 24, de XII, 267 p. — Prix: £35.00. — Clarendon Press, Oxford, 1988.

Contents: Elements of category theory. Introducing toposes. Local set theories. Fundamental properties of toposes. From logic to sheaves. Locale-valued sets. Natural numbers and real numbers. Epilogue: the wider significance of topos theory. Geometric theories and classifying toposes.

Andrew J. CASSON and Steven A. BLEILER. — **Automorphisms of surfaces after Nielsen and Thurston.** — London Mathematical Society Student Texts, vol. 9. — Un vol. broché, 15 × 23, de 104 p. — Prix: £20.00 (relié)/£7.50 (broché). — Cambridge University Press, Cambridge, 1988.

This book is designed to serve as an introduction to the applications of hyperbolic geometry to low dimensional topology. In particular it provides a concise exposition of the work of Nielsen and Thurston on the automorphisms of surfaces.

**Encyclopedia of statistical sciences, vol. 9: Strata chart to Zyskind-Martin models.** — Editors-in-Chief, Samuel Kotz, Norman L. Johnson. — Un vol. relié, 19 × 26, de XII, 762 p. — Prix: £92.00. — The «Encyclopedia of statistical sciences» is now available as a 9 volume set, (Prix: £645.00/US\$995.00). — John Wiley and Sons, New York, 1988.

The last volume of the series, this book contains a cumulative index for vol. 1 through 9. All users of statistics will turn to the «Encyclopedia of Statistical Sciences» as an essential reference work on statistical methods and their application to virtually all facets of human endeavor.

**ECM/87: Educational Computing in Mathematics.** — Proceedings of the International Congress on Educational Computing in Mathematics, Rome, Italy, 4-6 June 1987. — Ed. by T.F. Banchoff et al. — Un vol. relié, 17 × 24,5 de IX, 284 p. — Prix: US\$79.00/Dfl. 150.00. — North-Holland, Amsterdam, 1988.

This volume examines the use of computers in mathematical education and research. A number of papers report on European and North American projects where computer-aided teaching methods have been applied to mathematics education in various fields, including engineering and computer science. Other papers look at situations where current mathematical research takes advantage of the facilities offered by a computer.

**Nonlinear diffusion equations and their equilibrium states, I and II: Proceedings of a micro-program held August 25-September 12, 1986.** — Editors: W.-M. Li, L.A. Peletier, J. Serrin. — Mathematical Sciences Research Institute Publications, 12 and 13. — 2 vol. reliés, 16 × 24, de XIII, 359 p. et XIII, 365 p. — Prix: DM 64.00 et DM 65.00. — Springer-Verlag, New York, 1988.

The papers which comprise the 2 volumes of this work attest to a growing level of interest in nonlinear diffusion equations. The content and subject matter can be roughly classified into several individual categories: Singularity theory for solutions in both the elliptic and parabolic cases. Asymptotic behavior of solutions in both space and time. Blow-up phenomena associated with the non-continuity of solutions as time increases, as well as compact support questions when the operator arises in the theory of porous media. Studies of similarity solutions for elliptic and parabolic problems, leading to a number of fascinating questions in the theory of ordinary differential equations. Finally, the underlying Laplace operator in the problem discussed above can be replaced by more generalized variational operators of quasi-linear type, or by degenerate elliptic operators, leading to still further ramifications of the basic theory.

**Holomorphic functions and moduli, I and II.** — Editors: D. Drasin, C.J. Earle, F.W. Gehring, I. Kra, A. Marden. — Mathematical Sciences Research Institute Publications, 10 and 11. — 2 vol. reliés, 16 × 24, de XIII, 245 p. et XIII, 290 p. — Prix: DM 54.00 et DM 60.00. — Springer-Verlag, New York, 1988.

The Spring 1986 Program in Geometric Function Theory (GFT) at the Mathematical Sciences Research Institute brought together mathematicians interested in Teichmüller theory, quasiconformal mappings, Kleinian groups, univalent functions and value distribution. It included a large and stimulating Workshop preceded by a mini-conference on String Theory attended by both mathematicians and physicists.

D.J. DALEY; D. VERE-JONES. — **An introduction to the theory of point processes.** — Springer series in statistics. — Un vol. relié, 16 × 24, de XXI, 702 p. — Prix: DM 145.00. — Springer-Verlag, New York, 1988.

Stochastic point processes are sets of randomly located points in time, on the plane or in some general space. This book provides a general introduction to the theory, starting with simple

examples and an historical overview, and proceeding to the general theory. It covers recent work in a broad historical perspective in an attempt to provide a wider audience with insights into recent theoretical developments.

Albert MADANSKY. — **Prescriptions for working statisticians.** — Springer texts in statistics. — Un vol. relié,  $16 \times 24$ , de XIX, 295 p. — Prix: DM 74.00. — Springer-Verlag, New York, 1988.

The first course in Statistics typically covers inferential procedures which are valid only if a number of preconditions are satisfied by the data. This book, designed for a second course, contains a collection of statistical diagnostics and prescriptions necessary for the applied statistician so that he can deal with the realities of inference from data and not merely with the kind of classroom problems where all the data satisfy the assumptions associated with the technique being taught.

I. HLAVACEK; J. HASLINGER; J. NECAS; J. LOVISEK. — **Solution of variational inequalities in mechanics.** — Applied mathematical sciences, vol. 66. — Un vol. broché,  $15,5 \times 23,5$  de x, 275 p. — Prix: DM 84.00. — Springer-Verlag, New York, 1988.

This book deals with approximation and numerical realization of variational inequalities of elliptic type, having applications in mechanics of solids. Emphasis is devoted to the study of contact problems of elastic bodies and problems of plasticity. The main feature of the book is that problems are treated in all their complexity — from the analysis of the continuous models, existence and uniqueness results, to finite element models and the study of their mutual relation, error estimates, convergence results.

Martin GOLUBITSKY; Ian STEWART; David G. SCHAEFFER. — **Singularities and groups in bifurcation theory, vol. 2.** — Applied mathematical sciences, vol. 69. — Un vol. relié,  $16 \times 24$ , de xvi, 533 p. — Prix: DM 134.00. — Springer-Verlag, 1988.

Bifurcation theory studies how the structure of solutions to equations changes as parameters are varied. The nature of these changes depends both on the number of parameters and on the symmetries of the equations. Four broad topics are covered: Group theory and steady state bifurcation, equivariant singularity theory, Hopf bifurcation with symmetry, and mode interactions.

**Partial differential equations: Proceedings of ELAM VIII, held in Rio de Janeiro, July 14-25, 1986.** — Editors: F. Cardoso *et al.* — Lecture notes in mathematics, vol. 1324. — Un vol. broché,  $16,5 \times 24$ , de viii, 433 p. — Prix: DM 65.00. — Springer-Verlag, Berlin, 1988.

The Latin American School of Mathematics (ELAM) is one of the most important mathematical events in Latin America. The subject of the 1986 school was Partial Differential Equations with emphasis on microlocal analysis, scattering theory and the applications of nonlinear analysis to elliptic equations and Hamiltonian systems.

**Stochastic mechanics and stochastic processes: Proceedings of a conference held in Swansea, U.K., Aug. 4-8, 1986.** — Editors: A. Truman, I.M. Davies. — Lecture notes in mathematics, vol. 1325. — Un vol. broché,  $16,5 \times 24$ , de v, 220 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1988.

The main theme of the meeting was to illustrate the use of stochastic processes in the study of topological problems in quantum physics and statistical mechanics. Much discussion of current problems was generated and there was a considerable amount of interaction between mathematicians and physicians.



**Elliptic curves and modular forms in algebraic topology: Proceedings of a conference held at the Institute for Advanced Study, Princeton 1986.** — Editor: P.S. Landweber. — Lecture notes in mathematics, vol. 1326. — Un vol. broché, 16,5 × 24, de v, 224 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1988.

This conference was held to discuss new applications of elliptic functions and modular forms in algebraic topology, which had led to the introduction of elliptic genera and elliptic cohomology. The resulting papers range, from these topics through to quantum field theory, with considerable attention to formal groups, homology and cohomology theories, and circle action on spin manifolds.

Winfried BRUNS; Udo VETTER. — **Determinantal rings.** — Lecture notes in mathematics, vol. 1327. — Un vol. broché, 16,5 × 24, de VII, 236 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1988.

Determinantal rings and varieties have been a central topic of commutative algebra and algebraic geometry. Their study has attracted many prominent researchers and has motivated the creation of theories which may now be considered part of general commutative ring theory. The book gives a first coherent treatment of the structure of determinantal rings.

**Ring theory: Proceedings of a Conference held in Granada, Spain, Sept. 1-6, 1986.** — Editors: J.L. Bueso, P. Jara, B. Torrecillas. — Lecture notes in mathematics, vol. 1328. — Un vol. broché, 16,5 × 24, de IX, 331 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1988.

The papers in this proceedings volume are selected research papers in different areas of ring theory, including graded rings, differential operator rings,  $K$ -theory of noetherian rings, torsion theory, regular rings, cohomology of algebras, local cohomology of noncommutative rings.

**Functional analysis: Proceedings of the Seminar at the University of Texas at Austin, 1986-87.** — Editors: E. Odell, H. Rosenthal. — Lecture notes in mathematics, vol. 1332. — Un vol. broché, 16,5 × 24, de v, 202 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1988.

The articles in this volume range from those dealing with fresh research and discoveries to exposition and new proofs of older results. The main topics and themes include geometric and analytic properties of infinite-dimensional Banach spaces and their convex subsets as well as some aspects of Banach spaces associated with harmonic analysis and Banach algebras.

**Cabal Seminar 81-85: Proceedings, Caltech-UCLA Logic Seminar, 1981-85.** — Editors: A.S. Kechris, D.A. Martin, J.R. Steel. — Lecture notes in mathematics, vol. 1333. — Un vol. broché, 16,5 × 24, de v, 224 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1988.

This is the fourth volume of the proceedings of the Caltech-UCLA Logic Seminar, based mainly on material which was presented and discussed in the period 1981-85, but containing also some very recent results. It includes research papers dealing with determinacy hypotheses and their consequences in descriptive theory. An appendix contains the new Victoria Delfino problems.

**Theory of moduli.** — Lectures given at the 3rd 1985 Session of the Centro Internazionale Matematico Estivo (C.I.M.E.), held at Montecatini Terme, Italy, June 21-29, 1985. — Edited by E. Sernesi. — Lecture notes in mathematics, vol. 1337. — Un vol. broché, 16,5 × 24, de VIII, 232 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1988.

F. Catanese: Moduli of algebraic surfaces. — R. Donagi: The Schottky problem. — J.L. Harer: The cohomology of the moduli space of curves.

**Calculus of variations and partial differential equations.** — Proceedings of a conference held in Trento, Italy, June 16-21, 1986. — S. Hildebrandt, D. Kinderlehrer, M. Miranda, editors. — Lecture notes in mathematics, vol. 1340. — Un vol. broché,  $16,5 \times 24$ , de ix, 301 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1988.

*From the contents:* A. Arosio: Global solvability of second order evolution equations in Banach scales. — H. Beira da Veiga: On the incompressible limit of the compressible Navier-Stokes equations. — E. Bernardi, A. Bove, C. Parenti: On a class of hyperbolic operators with double characteristics, G. Buttazzo: Relaxation problems in control theory. — R. Finn: The inclination of an H-graph. — P.R. Garabedian: On the mathematical theory of vortex sheets. — N. Garofalo: New estimates of the fundamental solution and Wiener's criterion for parabolic equations with variable coefficients ... etc.

**Mathematical economics.** — Lectures given at the 2nd 1986 Session of the Centro Matematico Estivo (C.I.M.E.) held at Montecatini Terme, Italy, June 25-July 3, 1986. — Edited by A. Ambrosetti, F. Gori, R. Lucchetti. — Lecture notes in mathematics, vol. 1330. — Un vol. broché,  $16,5 \times 24$ , de vii, 137 p. — Prix: DM 23.00. — Springer-Verlag, Berlin, 1988.

I. Ekeland: Some variational methods arising from mathematical economics. — A. Mas-Colell: Four lectures on the differentiable approach to general equilibrium theory. — J. Scheinkman: Dynamic general equilibrium models. — S. Zamir: Topics in non cooperative game theory.

Srinivasa RAMANUJAN. — **The lost notebook and other unpublished papers.** — Introduction by George E. Andrews. — Un vol. relié,  $25 \times 31,5$ , de xxvii, 419 p. — Prix: DM 118.00. — Narosa Publishing House, New Delhi, and Springer-Verlag, Berlin, 1988.

The so-called «Lost Notebook» of S.R. Ramanujan was brought to light in 1976 as part of the Watson bequest, by G.E. Andrews. A major portion of the «Lost notebook» — really just 90 unpaginated sheets of work on q-series and other topics — is reproduced here in facsimile. Letters from Ramanujan to Hardy as well as various other sheets of seemingly related notes are then included. The next 180 pages consist of unpublished manuscripts of Ramanujan, including 28 pages from the «Loose papers» held in the Trinity College Library. Finally a number of interesting letters that were exchanged between Ramanujan, Littlewood, Hardy and Watson are collected together.

Richard M. KANE. — **The homology of Hopf spaces.** — North-Holland mathematical library, vol. 40. — Un vol. relié,  $15,5 \times 23$ , de xvi, 478 p. — Prix: £105.25/Dfl. 200.00. — North-Holland, Amsterdam, 1988.

This exposition of the theory of finite Hopf spaces details the development of the subject over the last thirty years, with the homology of such spaces as its main theme. The three chief areas of study in this volume are: the study of finite H-spaces with torsion free integral homology, the study of finite H-spaces with homology torsion, the construction of finite H-spaces.

**Queueing theory and its applications: «Liber amicorum» for J.W. Cohen.** — Edited by O.J. Boxma, R. Syski. — CWI monograph, vol. 7. — Un vol. relié,  $17,5 \times 25$ , de xxii, 446 p. — Prix: 97.25/Dfl. 185.00. — North-Holland, Amsterdam, 1988.

The twenty invited papers from the friends and colleagues of J.W. Cohen are grouped into five parts. Part I consists of survey papers which present a broad picture of the developments of queueing theory and performance evaluation. The other parts contain research papers with

problems such as the single server queue, analytic methods, queueing networks and their applications to communication and computer systems, and various topics in probability and statistics with implications for queueing theory.

Urban CEGRELL. — **Capacities in complex analysis.** — Aspects of mathematics, vol. E14. — Un vol. broché,  $16,2 \times 22,9$ , de XII, 153 p. — Prix: DM 42.00. — Friedr. Vieweg & Sohn, Braunschweig, 1988.

The purpose of this book is to study the capacity theory related to plurisubharmonic and analytic functions in  $\mathbb{C}$ . Capacities can be thought of as a non-linear generalization of measures. The case of one complex variable is very well understood since a long time. In it, the link between functions and capacities is the Laplace operator. The corresponding link in  $\mathbb{C}$ , however, is the highly non-linear complex Monge-Ampère operator. This book presents, for the first time, the most important parts of the recent research on this non-linear theory.

**Farbige Parkette:** mathematische Theorie und Ausführung mit dem Computer: vier Aufsätze zur ebenen Kristallographie. — K. Bongartz, W. Borho, D. Mertens, A. Steins, Autoren. — Mathematische Miniaturen, Bd. 4. — Un vol. broché,  $11 \times 18$ , de 203 p. — Prix: Sfr. 22.00. — Birkhäuser-Verlag, Basel, 1988.

Ein Interview: «Mathematik — Tradition und Zukunftsperspektiven», Gesprächspartner: Heinz Wolff und Walter Borho. — Walter Borho: Farbige Ornamente. — Klaus Bongartz und Andreas Steins: Über Dirichlet-Parkette. — Klaus Bongartz und Walter Borho: Ein Bericht über farbige Ornamente und Parkette. — Klaus Bongartz und Detlef Mertens: Die achthundert-drei Klassen dreihinvarianter Farbparkettgruppen.

**Orthogonal polynomials and their applications.** — Proceedings of an international symposium, held in Segovia, Spain, Sept. 22-27, 1986. — Lecture notes in mathematics, vol. 1329. — Un vol. broché,  $16,5 \times 24$ , de xv, 334 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1988.

This volume contains original research papers as well as survey papers about fundamental questions in the field of orthogonal polynomials (Nevai, Rakhmanov & Lopez) and its relationship with other fields such as group theory (Koornwinder), Padé approximation (Brezinski), differential equations (Krall, Littlejohn) and numerical methods (Rivlin).

**Global analysis: studies and applications III.** — Edited by Yu. G. Borisovich, Yu. E. Gliklikh. — Lecture notes in mathematics, vol. 1334. — Un vol. broché,  $16,5 \times 24$ , de v, 331 p. — Prix: DM 50.00. — Springer-Verlag, Berlin, 1988.

This lecture notes volume, presents to English speaking readers two issues of the Voronezh University Press series «New developments in global analysis». These issues published in Russian, in March and November, 1987, are entitled «Global analysis and mathematical physics» and «Geometry and theory of singularities in nonlinear equations», respectively. For this translation volume, articles of survey character as well as research articles have been selected.

**Dynamical systems, Valparaiso 1986.** — Proceedings of a symposium held in Valparaiso, Chile, November 24-29, 1986. — Lecture notes in mathematics, vol. 1331. — Un vol. broché,  $16,5 \times 24$ , de vi, 250 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1988.

This volume contains original research papers on topics central to dynamical systems, such as fractional dimensions (Hausdorff dimension, limity capacity) and limit cycles of polynomial vector fields concerning the well known Dulac and Hilbert's 16th problems. Stability and bifurcation, intermittency, normal forms, Anosov flows and foliations are also themes treated.

Bernard HELFFER. — **Semi-classical analysis for the Schrödinger operator and application**. — Lecture notes in mathematics, vol. 1336. — Un vol. broché,  $16,5 \times 24$ , de v, 107 p. — Prix DM 23.00. — Springer-Verlag, Berlin, 1988.

This introduction to semi-classical analysis is an extension of a course given by the author at the University of Nankai. It presents for some of the standard cases presented in quantum mechanics books, a rigorous study of the tunneling effect, as an introduction to recent research work.

Angelo B. MINGARELLI, S. Gotskalk HALVORSEN. — **Non-oscillation domains of differential equations with two parameters**. — Lecture notes in mathematics, vol. 1338. — Un vol. relié  $16,5 \times 24$ , de xi, 109 p. — Prix: DM 23.00. — Springer-Verlag, Berlin, 1988.

This research monograph is an introduction to single linear differential equations (systems with two parameters and extensions to difference equations and Stieltjes integral equations). The scope is a study of the values of the parameters for which the equation has one solution(s) having one (finitely many) zeros. The prototype is Hill's equation or Mathieu's equation.

**Geometry and analysis on manifolds**. — Proceedings of the 21st International Taniguchi Symposium held at Katata, Japan, Aug. 23-29 and the Conference held at Kyoto, Aug. 31-Sept. 2, 1987. — Edited by T. Sunada. — Lecture notes in mathematics, vol. 1339. — Un vol. relié,  $16,5 \times 24$ , de ix, 277 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1988.

The Taniguchi Symposium on global analysis on manifolds focused mainly on the relationships between some geometric structures of manifolds and analysis, especially spectral analysis on noncompact manifolds. Included in the present volume are expanded versions of the invited lectures. In these original research articles, the reader will find up to date accounts of the subject.

J.-B. HIRIART-URRUTY, Y. PLUSQUELLEC. — **Exercices d'algèbre linéaire et bilinéaire**. — Collection Languedoc-Sciences. — Un vol. broché,  $17 \times 24$ , de 307 p. — Prix: FF 159.00. — CEPADUES-Editions, Toulouse, 1988.

Cet ouvrage présente l'algèbre linéaire et bilinéaire au niveau Bac + 2 (programme des DEUG rénovés, nouveaux programmes des classes de Spéciales) à partir d'exercices de difficulté graduée. Sont également proposées des applications simples à l'analyse numérique matricielle et l'optimisation.

Marcel RIESZ. — **Collected papers**. — Ed. by Lars Gårding and Lars Hörmander. — Un vol. relié,  $17 \times 25$ , de vi, 897 p. — Prix: DM 108.00. — Springer-Verlag, Berlin, 1988.

This edition of Marcel Riesz's Collected papers contain most of his published papers with the exception of a few papers in Hungarian that were subsumed into later books. It also includes a translation of Riesz's thesis on summable trigonometric series and summable power series.

**Statistical information and likelihood: a collection of critical essays by Dr. D. Basu**. — Ed. by J.K.Ghosh. — Lecture notes in statistics, vol. 45. — Un vol. broché,  $16,5 \times 24$ , de xix, 365 p. — Prix: DM 65.50. — Springer-Verlag, New York, 1988.

This book is a collection of essays on the foundations of statistical inference. The sequence in which the essays have been arranged makes it possible to read the book as a single contemporary discourse on the likelihood principle, the paradoxes that attend its violation, and the radical deviation from classical statistical practices that its adoption would entail. The book can also be read, with the aid of the notes as a chronicle of the development of Basu's ideas.

Harley COHEN, Robert G. MUNCASTER. — **The theory of pseudo-rigid bodies.** — Springer tracts in natural philosophy, vol. 33. — Un vol. broché,  $16 \times 24$ , de x, 183 p. — Prix: DM 128.00. — Springer-Verlag, New York, 1988.

This monograph presents the work of the authors on the theory of pseudo-rigid bodies. A new theory of the deformation of bodies is presented which not only has a firm theoretical basis, but is simple enough to serve as an effective tool in practical problems. The main body of the text is a multifaceted development of the theory, beginning with foundations, and proceeding to cover explicit solutions, linearizations, and methods of approximation.

Roger TEMAM. — **Infinite-dimensional dynamical systems in mechanics and physics.** — Applied mathematical sciences, vol. 68. — Un vol. relié,  $16 \times 24$ , de xvi, 500 p. — Prix: DM 124.00. — Springer-Verlag, New York, 1988.

This book is a first attempt for a systematic study of infinite dimensional dynamical systems generated by dissipative evolution partial differential equations arising in mechanics and physics, along with other areas of science and technology. A synthetic view of the relation between infinite and finite dimensional systems is presented. Equations considered include relation-diffusion, Navier-Stokes and other fluid mechanics equations, magnetohydrodynamics, thermohydraulics, pattern formation, Ginzburg-Landau and damped wave. The last chapter of the book introduces inertial manifolds.

Monique DAUGE. — **Elliptic boundary value problems on corner domains: smoothness and asymptotics of solutions.** — Lecture notes in mathematics, vol. 1341. — Un vol. broché,  $16,5 \times 24$ , de viii, 259 p. — Prix: DM 42.50. — Springer-Verlag, Berlin, 1988.

This research monograph focuses on a large class of variational elliptic problems with mixed boundary conditions on domains with various corner singularities, edges, polyhedral vertices, cracks, slits. Basic knowledge about boundary value problems on smooth domains in Sobolev spaces is the main prerequisite to the understanding of this book.

F. GUILLEN...(*et al.*). — **Hyperrésolutions cubiques et descente cohomologique.** — Lecture notes in mathematics, vol. 1335. — Un vol. broché,  $16,5 \times 24$ , de xii, 192 p. — Prix: DM 35.00. — Springer-Verlag, Berlin, 1988.

This monograph establishes a general context for the cohomological use of Hironaka's theorem on the resolution of singularities. It presents the theory of cubical hyperresolutions, and this yields the cohomological properties of general algebraic varieties, following Grothendieck's general ideas on descent as formulated by Deligne in his method for simplicial cohomological descent.

Paul BAMBERG, Shlomo STERNBERG. — **A course in mathematics for students of physics, vol. 1.** — Un vol. relié,  $18 \times 25$ , de xvii, 405 p. — Prix: \$40.00/US\$49.50. — Cambridge University Press, Cambridge, 1988.

This textbook has been developed from a course taught at Harvard University over the last decade. The course covers principally the theory and physical applications of linear algebra and of the calculus of several variables, particularly the exterior calculus.

**New advances in transcendence theory.** — Ed. by Alan Baker. — Un vol. relié,  $15,5 \times 23,5$ , de xii, 434 p. — Prix: £45.00/US\$79.50. — Cambridge University Press, Cambridge, 1988.

These are the proceedings of a symposium on Transcendental Number Theory held in Durham in 1986. The papers cover all the main branches of the subject, and include new research survey articles.



**Nonstandard analysis and its applications.** — Ed. by Nigel Cutland. — London Mathematical Society student texts, vol. 10. — Un vol. broché,  $15,5 \times 22,5$ , de XIII, 346 p. — Prix: £27.50/US\$49.50 (relié) et £9.95/US\$19.95 (broché). — Cambridge University Press, Cambridge, 1988.

This book arises from a conference held in July 1986 at the University of Hull which was designed to provide both an introduction to the subject through introductory lectures, and surveys of the present state of research. One of the book's attractions is that a standard notation is used throughout and so the underlying theory is easily applied in a number of different settings.

Paul KOOSIS. — **The logarithmic integral, I.** — Cambridge studies in advanced mathematics vol. 12. — Un vol. relié,  $15,5 \times 23,5$ , de XVI, 606 p. — Prix: £60.00/US\$89.50. — Cambridge University Press, Cambridge, 1988.

The theme of this work lies athwart much of 20th century analysis. It is a thread connecting many apparently separate parts of the subject, and so is a natural point at which to begin serious study of real and complex analysis. The author's aim is to show how one can build up an investigation which explains and clarifies many different, seemingly unrelated problems: to show in effect, how mathematics grows.

G.R. BELITSKII, Yu.I. LYUBICH. — **Matrix norms and their applications.** — Operator theory: advances and applications, vol. 36. — Un vol. relié,  $17 \times 24$ , de VIII, 209 p. — Prix: Sfr. 118.00. — Birkhäuser Verlag, Basel, 1988.

This monograph is the first available systematic exposition of the theory of matrix norms. Norms are an effective and flexible tool for investigating the properties of matrices, as well as a means for deriving a variety of estimates needed in many areas of mathematics and its applications. The book pursues a number of interesting connections with graph theory. A wide spectrum of applications, including spectral problem, stability theory, finite Markov chains, and computational schemes are considered.

V.I. ARNOLD, S.M. GUSEIN-ZADE, A.N. VARCHENKO. — **Singularities of differentiable maps, vol. 2: monodromy and asymptotics of integrals.** — Monographs in mathematics, vol. 83. — Un vol. relié,  $17,5 \times 24$ , de VIII, 492 p. — Prix: Sfr. 198.00. — Birkhäuser, Boston, 1988.

In the first part, the authors consider the topological structure of isolated critical points of holomorphic functions. The second part is devoted to the study of the asymptotic behaviour of integrals of the method of stationary phase, which is widely met with in applications. The third and last part deals with integrals evaluated over level manifolds in a neighborhood of the critical point of a holomorphic function.

**Numerical mathematics, Singapore 1988.** — Proceedings of the International Conference on Numerical Mathematics held at the National University of Singapore, May 31-June 4, 1988. — Edited by R.P. Agarwal, Y.M. Chow, S.J. Wilson. — International series of numerical mathematics, vol. 86. — Un vol. relié,  $17 \times 24$ , de XIII, 526 p. — Prix: Sfr. 118.00. — Birkhäuser, Basel, 1988.

Some 160 mathematicians from 30 countries attended this conference. This volume contains 42 original papers which reflect a wide range of the important current research areas such as approximation theory, discrete mathematics, ordinary and partial differential equations, integral equations, quadratures, mathematical modelling, multivariate polynomial equations, and engineering applications.

Pierre BREMAUD. — **An introduction to probabilistic modeling.** — Undergraduate texts in mathematics. — Un vol. relié, 16 × 25, de xvi, 207 p. — Prix: DM 74.00 — Springer-Verlag, New York, 1988.

This book is designed for a one-semester course in which the student is exposed to the basic concepts of independence, expectation, convergence in law, and almost-sure convergence, and learns to carry out computations, especially those concerning Gaussian vectors and Poisson processes. The text is complemented by a large number of exercises, each with a detailed solution.

Jean-Paul DELAHAYE. — **Sequence transformations.** — Springer series in computational mathematics, vol. 11. — Un vol. relié, 16 × 24, de xxi, 252 p. — Prix: DM 128.00. — Springer-Verlag, Berlin, 1988.

The book gives a clear and concise summary of the fields of sequence transformations and convergence acceleration methods. Some of the outstanding features are: precise definitions of algorithmic sequence transformations, a study of the power of sequence transformations, proof of negative results on acceleration methods (namely, that some sequence families are not accelerable), new algorithms for convergence acceleration (in particular automatic selection procedures).

Lars GÅRDING, Torbjörn TAMBOUR. — **Algebra for computer science.** — Universitext. — Un vol. broché, 15,5 × 23,5, de ix, 198 p. — Prix: DM 54.00. — Springer-Verlag, New York, 1988.

This work is a concise presentation of number theory, algebra, and group theory and their applications to some parts of computer science, among them the finite Fourier transform, algebraic complexity theory, coding, Boolean algebra, monoids and rational languages. A choice of exercises has made it possible to cover a large amount of material without sacrificing readability.

Timothy R.C. READ, Noel A.C. CRESSIE. — **Goodness-of-fit statistics for discrete multivariate data.** — Springer series in statistics. — Un vol. relié, 16 × 24, de xi, 211 p. — Prix: DM 84.00. — Springer-Verlag, New York, 1988.

The book provides the reader with a unified analysis of a number of traditional goodness-of-fit tests for discrete multivariate data and introduces some new test statistics, such as the power-divergence family which is used to link the traditional test statistics through a single real-valued parameter and provides a way to consolidate and extend the current fragmented literature.

D.R. BLAND. — **Wave theory and applications.** — Oxford applied mathematics and computing science series. — Un vol. broché, 14 × 22, de ix, 317 p. — Prix: £ 15.00 (Relié: £ 40.00). — Clarendon Press, Oxford, 1988.

This textbook is a modern introduction to wave theory and its applications to physical phenomena such as deep water waves, transmission lines, elasticity, and traffic flow. One of the book's strengths is a detailed coverage of non-linear and elastic waves, and an entire chapter is devoted to the use of characteristics and asymptotic expansions.

**Let Newton be!** — Edited by John Fauvel, Raymond Flood, Michael Shortland and Robin Wilson. — Un vol. broché, 19,5 × 25, de 272 p. — Prix: £ 17.50. — Clarendon Press, Oxford, 1988.

This lucidly written and richly illustrated book explores the many facets of Newton's life and labours and assesses how he came to influence posterity so profoundly. The book has been written for all those interested in the historical development of ideas and thus both the general reader and specialists in particular fields will find much of interest here.

Henri MASCART, Marius STOKA. — **Fonctions d'une variable réelle. Tomes 4 et 5: exercices et corrigés.** — Collection «Mathématiques». — 2 vol. brochés,  $15 \times 21,5$  de 254 p. et 174 p. — Prix: FF 195.00 et FF 175.00. — Presses universitaires de France, Paris, 1988.

Le tome 4 met en évidence les fonctions réelles d'une variable réelle qui possèdent des propriétés intéressantes (par exemple, fonctions convexes, fonctions à variation bornée). Les chapitres suivants étudient les séries numériques et les séries de fonctions à l'aide des résultats classiques, en insistant sur les différentes notions de convergence. Le tome 5, qui termine l'ensemble consacré aux fonctions d'une variable réelle, traite de méthodes très souvent employées par les «utilisateurs» des mathématiques et, paradoxalement, trop négligées par les mathématiciens eux-mêmes: suites de fonctions orthogonales, transformation de Laplace, fonctions spéciales.

Gregory KARPILOVSKY. — **Unit groups of classical rings.** — Oxford science publications. — Un vol. relié,  $16 \times 24$ , de XIV, 370 p. — Prix: £50.00. — Clarendon Press, Oxford, 1988.

The subject matter of this book lies at the crossroads of four areas: ring theory, group theory, group representation theory, and algebraic number theory. A multitude of concepts and devices pertaining to the structure of groups and rings, algebraic K-theory, algebraic and analytic number theory, valuation theory and group representation theory are used in open or disguised form to investigate the structure of the unit group of a particular ring.

Audrey TERRAS. — **Harmonic analysis on symmetric spaces and applications II.** — Un vol. broché,  $15,5 \times 23,5$ , de XI, 385 p. — Prix: DM 128.00. — Springer-Verlag, New York, 1988.

This second volume consists of two chapters. The first concerns the symmetric space of positive definite symmetric real matrices, the analogue of Fourier analysis for this space, and fundamental domains under discrete groups of isometries. In the second chapter, the author considers general symmetric spaces over number fields, indicating generalizations of some of the results of the preceding chapter.

Yuan Shih CHOW, Henry TEICHER. — **Probability theory: independence, interchangeability, martingales.** — Second edition. — Springer texts in statistics. — Un vol. relié,  $16 \times 24$ , de XVIII, 467 p. — Prix: DM 78.00. — Springer-Verlag, New York, 1988.

The subjects of this book are the measure theoretical foundation of the theory and the main laws and theorems which emerge therefrom. Particular emphasis is placed on stopping times, as tools in proving theorems as well as objects of interest in themselves. Among their applications is renewal theory; another useful application is connected with the limiting behavior of random walks.

Stephen WIGGINS. — **Global bifurcations and chaos: analytical methods.** — Applied mathematical sciences, vol. 73. — Un vol. relié,  $16 \times 24,5$ , de XIV, 494 p. — Prix: DM 98.00. — Springer-Verlag, Berlin, 1988.

This book not only defines the concept of chaos in deterministic systems, but it describes the mechanisms which give rise to chaos (i.e. homoclinic and heteroclinic motions) and derives explicit techniques whereby these mechanisms can be detected in specific systems. These techniques can be viewed as generalizations of Melnikov's method to multi-degree of freedom systems subject to slowly varying parameters and quasiperiodic excitations.



Izrail M. GELFAND. — **Collected papers, vol. II.** — Ed. by S.G. Gindikin, V.W. Guillemin, A.A. Kirillov, B. Kostant, S. Sternberg. — Un vol. relié,  $17 \times 25$ , de x, 1039 p. — Prix: DM 248.00. — Springer-Verlag, Berlin, 1988.

The second volume of I.M. Gelfand's papers contains articles connected with representation theory. It encompasses more than 40 years of intensive scientific activity of I.M. Gelfand and his colleagues and apprentices. Representation theory as conceived by I.M. Gelfand is a very broad domain connected with many other parts of mathematics, both classical and new. A substantial part of the papers have been translated into English especially for this edition.

R. MEAD. — **The design of experiments: statistical principles for practical applications.** — Un vol. relié,  $16 \times 23,5$ , de xiv, 620 p. — Prix: £65.00. — Cambridge University Press, Cambridge, 1988.

This book is about the statistical principles of good experimental design and is intended for all applied statisticians and practising scientists engaged in the design, implementation and analysis of experiments. Emphasis is placed on the logical principles of statistical design and a minimum of mathematics is employed. It is assumed that the large-scale analysis of data will be performed by computers and more attention can thus be devoted to discussions of how all the available information can be used to extract the clearest answers to many questions.

L.R. MUSTOE. — **Worked examples in advanced engineering mathematics.** — Un vol. broché,  $13 \times 20$ , de x, 137 p. — Prix: £6.95. — John Wiley and Sons, Chichester, 1988.

This undergraduate text consists of worked solutions to a wide variety of examination questions in advanced engineering mathematics. The examples chosen cover a typical second year engineering mathematics syllabus.

B.D. RIPLEY. — **Statistical inference for spatial processes.** — Un vol. relié,  $15,5 \times 23,5$ , de viii, 148 p. — Prix: £20.00. — Cambridge University Press, Cambridge, 1988.

The study of spatial processes and their applications is an important topic in statistics and finds wide application particularly in computer vision and image processing. One of the themes of the book is to show how these techniques give new insights into classical procedures and newer statistical paradigms such as Monte-Carlo inference and pseudo-likelihood. The importance of edge effects and the lack of a unique asymptotic setting in spatial problems is also stressed.

Bernard BEAUZAMY. — **Introduction to operator theory and invariant subspaces.** — North-Holland mathematical library, vol. 42. — Un vol. relié,  $15,5 \times 23$ , de xiv, 358 p. — Prix: US\$ 84.25/Dfl. 160.00. — North-Holland, Amsterdam, 1988.

This monograph only requires of the reader a basic knowledge of classical analysis: measure theory, analytic functions, Hilbert spaces, functional analysis. Much new material is presented. On the invariant subspace problem, the level of research is reached, both in the positive and negative directions. Contents: General theory. Compactness and its applications. Banach algebras techniques. Analytic functions. Dilations and extensions. Invariant subspaces.

**Quality control and reliability.** — Ed. by P.R. Krishnaiah, C.R. Rao. — Handbook of statistics, vol. 7. — Un vol. relié,  $17 \times 24,5$ , de xiv, 503 p. — Prix: US\$ 120.00/Dfl. 290.00. — North-Holland, Amsterdam, 1988.

Volume 7 of the «Handbook of Statistics», a series of 14 self-contained reference books, covers an area of statistics dealing with complex problems in the production of goods and

services, maintenance and repair and management and operations. The opening chapter is by W. Edwards Deming, a pioneer in statistical quality control, who was involved in the quality control movement in Japan and helped the country in its rapid industrial development.

L. LE BRUYN, M. VANDEN BERGH, F. VAN OYSTAEYEN. — **Graded orders.** — Un vol. broché, 15,5 × 23,5, de VI, 208 p. — Prix: SFr. 42.00. — Birkhäuser, Boston, 1988.

This book provides the first systematic treatment of structure results for algebras which are graded by a group. The graded methods allow the study of regularity conditions on order. The book also touches upon representation theoretic methods, including orders of finite representation type and other aspects of this theory applicable to the classification of orders. The final chapter describes the ring theoretical approach to the classification of orders of global dimension two.

Hugh THURSTON. — **Intermediate mathematical analysis.** — Oxford science publications. — Un vol. relié, 16 × 24, de VIII, 164 p. — Prix: £25.00 (broché: £12.50). — Clarendon Press, Oxford, 1988.

This textbook provides a readable, though rigorous, introduction to the theory of the differentiation and integration of functions of several variables. The author has included informal explanations of many of the proofs of results. Numerous exercises and problems will help the reader gain both an understanding and confidence in the subject as well as an intuitive feel for the main themes.

Ramesh GANGOLLI, V.S. VARADARAJAN. — **Harmonic analysis of spherical functions on real reductive groups.** — *Ergebnisse der Mathematik und ihrer Grenzgebiete*, 2. Folge, Bd. 101. — Un vol. relié, 17 × 25, de XIV, 365 p. — Prix: DM 198.00. — Springer-Verlag, Berlin, 1988.

The purpose of this book is to give a thorough treatment of the harmonic analysis of spherical functions on symmetric spaces. The book attempts to give a definite treatment of these results from the spectral theoretic viewpoint. The harmonic analysis of spherical functions treated here contains the essentials of large parts of harmonic analysis of more general functions on semi-simple Lie groups.

**Search theory: some recent developments.** — Edited by David V. Chudnovsky, Gregory V. Chudnovsky. — *Lecture notes in pure and applied mathematics*, vol. 112. — Un vol. broché, 18 × 25, de XI, 155 p. — Prix: \$89.75 (U.S. et Canada), \$107.50 (tous les autres pays). — Marcel Dekker, New York, 1988.

Providing immediate access to modern search theory, state-of-the-art methods, related areas of mathematics and their techniques, and applications, this reference surveys classical results and approaches to search theory as well as the latest procedures of optimal and nearly optimal search planning for the most detailed and comprehensive source on the subject.

Bernhard FLURY. — **Common principal components and related multivariate models.** — *Wiley series in probability and mathematical statistics: applied probability and statistics series.* — Un vol. relié, 16 × 23,5, de XIII, 258 p. — John Wiley and Sons, New York, 1988.

New developments in principal component analysis have led to generalizations of principal components that apply to cases where the data fall in natural groups. This book treats both the classical method and the recent generalizations, including the model of proportional covariance matrices, the common principal component model, and variations of the latter. All methods are well illustrated by numerical examples based on real data.