BULLETIN BIBLIOGRAPHIQUE

Combinatorial designs: a tribute to Haim Hanani. — Edited by A. Hartman. — Annals of discrete mathematics, vol. 42. — Un vol. relié, 17 × 24,5, de 386 p. — Prix: Dfl. 240.00. — North-Holland, Amsterdam, 1989.

Haim Hanani pioneered the techniques for constructing designs and the theory of pairwise balanced designs, leading directly to Wilson's existence theorem. He also led way in the study of resolvable designs, covering and packing problems, latin squares, 3-designs and other combinatorial configurations. The Hanani volume is a collection of research and survey papers at the forefront of research in combinatorial design theory, including Prof. Hanani's own latest work on balanced incomplete block designs. Other areas covered include Steiner systems, finite geometries, quasigroups and *t*-designs.

Jürgen BOKOWSKI, Bernd STURMFELS. — **Computational synthetic geometry.** — Lecture notes in mathematics, vol. 1355. — Un vol. broché, 16,5 × 24, de v, 168 p. Prix: DM 30.00. — Springer-Verlag, Berlin, 1989.

Computational synthetic geometry deals with methods for realizing abstract geometric objects in concrete vector spaces. This research monograph considers a large class of problems from convexity and discrete geometry including constructing convex polytopes from simplicial complexes, vector geometries from incidence structures and hyperplane arrangements from oriented matroids.

H.T. NGUYEN, G.S. ROGERS. — **Fundamentals of mathematical statistics, vol. 1: Probability for statistics. et vol. 2: Statistical inference.** — Springer texts in statistics. — 2 vol. reliés, de X, 432 p. et XI, 422 p. respectivement. Prix: DM 84.00 chaque volume. — Springer-Verlag, New York, 1989.

These two volumes are designed for a two semester course at the senior/graduate level. The material is divided in lessons (each for a 50 minute class) with complementary exercises and home work. The presentation is rigourous and complete. The reader needs a thorough familiarity with calculus. Contents of vol. 1: Elementary probability and statistics, probability and expectation, limiting distributions. Contents of vol. 2: Sampling and distributions, statistical estimation, testing hypotheses, special topics, tables.

Nathan JACOBSON. — **Basic algebra II.** — Second edition. — Un vol. relié, 18 × 24, de 686 p. — Prix: £37.95. — W.H. Freeman and Company Limited, Oxford, 1989.

Introduction. — Categories. — Universal algebra. — Modules. — Basic structure theory of rings. — Classical representation theory of finite groups. — Elements of homological algebra with applications. — Commutative ideal theory: general theory and Noetherian rings. — Field theory. — Valuation theory. — Dedekind domains. — Formally real fields.

Robert J. BASTON and Michael G. EASTWOOD. — **The Penrose transform : its interaction with representation theory.** — Oxford mathematical monographs. — Un vol. relié, 16 × 24, de XV, 213 p. — Prix: £25.00. — Clarendon Press, Oxford, 1989.

Introduction. — Lie algebras and flag manifolds. — Homogeneous vector bundles on G/P. — The Weyl group, its actions, and Hasse diagrams. — The Bott-Borel-Weil theorem. — Realizations of G/P. — The Penrose transform in principle. — The Bernstein-Gelfand-Gelfand resolution. — The Penrose transform in practice. — Constructing unitary representations. — Module structures on cohomology. — Conclusions and outlook.

A.J. HAHN, O.T. O'MEARA. — **The classical groups and K-theory.** — Grundlehren der mathematischen Wissenschaften, Bd. 291. — Un vol. relié, 16 × 24, de XV, 576 p. — Prix: DM 198.00. — Springer-Verlag, Berlin, 1989.

The book gives a comprehensive account of the basic algebraic properties of the classical groups over rings. Much of the theory appears in book form for the first time, and most proofs are given in detail. The book also includes a revised and expanded version of Dieudonné's classical theory over division rings. *From the foreword by J. Dieudonné:* "All mathematicians interested in classical groups should be grateful to these two outstanding investigators for having brought together old and new results (many of them their own) into a superbly organized whole. I am confident that their book will remain for a long time the standard reference in the theory."

Derek F. LAWDEN. — **Elliptic functions and applications.** — Applied mathematical sciences, vol. 80. — Un vol. relié, 16 × 24, de XIV, 334 p. — Prix: DM 124.00. — Springer-Verlag, New York, 1989.

Theta-functions. — Jacobi's elliptic functions. — Elliptic integrals. — Geometrical applications. A Physical applications. — Weierstrass's elliptic function. — Applications of the Weierstrass functions. — Complex variable analysis. — Modular transformations. — Appendix. — Tables.

R. KRESS. — **Linear integral equations.** — Applied mathematical sciences, vol. 82. — Un vol. relié, 16 × 24, de XI, 299 p. — Prix: DM 78.00. — Springer-Verlag, New York, 1989.

Normed spaces. — Bounded and compact operators. — The Riesz theory. — Dual systems and Fredholm theory. — Regularization in dual systems. — Potential theory. — Singular integral equations. — Sobolev spaces. — The heat equation. — Operator approximations. — Degenerate kernel approximation. — Quadrature methods. — Projection methods. — Iterative solution and stability. — Equations of the first kind. — Tikhonov regularization. — Regularization by discretization. — Inverse scattering theory.

Nonlinear functional analysis. — Edited by P.S. Milojevic. — Lecture notes in pure and applied mathematics, vol. 121. — Un vol. broché, 18 × 25, de VIII, 264 p. — Prix: $89.75 (USA et Canada), $107.50 (autres pays). — Marcel Dekker, New York, 1990.

These proceedings consist of a collection of papers based on lectures presented at the Special Session on Nonlinear Functional Analysis of the American Mathematical Society Regional Meeting held at New Jersey Institute of Technology in Newark, N.J., on April 25-26, 1987. The topics covered are global invertibility and finite solvability of nonlinear differential equations, existence of positive eigenvalues and eigenvalues for compact and condensing-like maps, recent progress in Hamiltonian dynamics and symplectic geometry, solvability of semilinear operator

and hyperbolic differential equations, operator-valued means and their iterates, and existence of multiple critical points of functionals preserving an order structure.

Logic, methodology and philosophy of science VIII. — Proceedings of the eighth International Congress of Logic, Methodology and Philosophy of Science, Moscow, 1987. — Edited by Jens Erik Fenstad, Ivan T. Frolov, Risto Hilpinen. — Studies in logic and the foundations of mathematics, vol. 126. — Un vol. relié, 16 × 23, de XVII, 702 p. — Prix: US$207.25/ Dfl. 425.00. — North-Holland, Amsterdam, 1989.

The volume contains 37 invited papers covering the following areas: New patterns of explanation in science. Science and ethics. Foundations of mathematical reasoning. Model theory. Foundations of computing and recursion theory. Set theory. General logic. General methodology of science. Foundations of: mathematical probability and statistical inference, physical sciences, biological sciences, psychology and cognitive sciences, social sciences, linguistics. History of logic, methodology and philosophy of science.

Hans REITER. — **Metaplectic groups and Segal algebras.** — Lecture notes in mathematics, vol. 1382. — Un vol. broché, 16,5 × 24,5 de XI, 128 p. — Prix: DM 25.00. — Springer-Verlag, Berlin, 1989.

These notes give an account of recent works in harmonic analysis dealing with the analytical foundations of A. Weil's theory of metaplectic groups. It is shown that Weil's main theorem holds for a class of functions (a certain Segal algebra) larger than that of the Schwartz-Bruhat functions considered by Weil. The theorem is derived here from some general results about this class which seems to be a rather natural one in the context of Weil's theory.

Harmonic analysis and partial differential equations. — Proceedings of the International Conference held in El Escorial, Spain, June 9-13, 1987. — J. Garcia-Cuerva, ed. — Lecture notes in mathematics, vol. 1384. — Un vol. broché, 16,5 × 24,5 de VII, 213 p. — Prix: DM 37.00. — Springer-Verlag, Berlin, 1989.

The programme of the Conference at El Escorial included 4 main courses of 3-4 hours. Their content is reflected in the four survey papers in this volume by D.L. Burkholder, P.W. Jones, C.E. Kenig, and S. Wainger. Also included are the ten 45-minute lectures of a more specialized nature.

Numerical methods for ordinary differential equations. — Proceedings of the Workshop held in L'Aquila (Italy), Sept. 16-18, 1987. — A. Bellen, C.W. Gear, E. Russo (eds). — Lecture notes in mathematics, vol. 1386. — Un vol. broché, 16,5 × 24,5 de VII, 136 p. — Prix: DM 25.00. — Springer-Verlag, Berlin, 1989.

Developments in numerical initial value ODE methods were the focal topic of the meeting at L'Aquila which explored the connections between the classical background and new research areas such as differential-algebraic equations, delay integral and integro-differential equations, stability properties, continuous extensions (interpolants for Runge-Kutta methods and their applications, effective stepsize control, parallel algortihms for small- and large-scale parallel architectures).

Miodrag PETKOVIC. — **Iterative methods for simultaneous inclusion of polynomial zeros.** — Lecture notes in mathematics, vol. 1387. — Un vol. broché, 16,5 × 24,5 de X, 263 p. — Prix: DM 45.00. — Springer- Verlag, Berlin, 1989.

The simultaneous inclusion of polynomial complex zeros is a crucial problem in numerical analysis. Rapidly converging algorithms are presented in these notes, including convergence analysis in terms of circular regions and in complex arithmetic. Parallel circular iterations, where the approximations to the zeros have the form of circular regions containing these zeros, are efficient because they also provide error estimates. There are at present no book publications on this topic and one of the aims of this book is to collect most of the algorithms produced in the last 15 years.

Mathematical logic and applications. — Proceedings of the Logic Meeting held in Kyoto, 1987. — J. Shinoda, T.A. Slaman, T. Tugué (eds.). — Lecture notes in mathematics, vol. 1388. — Un vol. broché, 16,5 × 24,5 de v, 223 p. — Prix: DM 37.00. — Springer-Verlag, Berlin, 1989.

These proceedings include the papers presented at the logic meeting held at the Research Institute for Mathematical Sciences, Kyoto University, in the summer of 1987. The meeting mainly covered the current research in various areas of mathematical logic and its applications in Japan. Several lectures were also presented by logicians from other countries, who visited Japan that summer.

Algebraic curves and projective geometry. — Proceedings of the Conference held in Trento, Italy, March 21-25, 1988. — E. Ballico, C. Ciliberto (eds.). — Lecture notes in mathematics, vol. 1389. — Un vol. broché, 16,5 × 24,5 de v, 288 p. — Prix: DM 45.00. — Springer-Verlag, Berlin, 1989.

Material reported in formal and informal lectures at the meeting in Trento forms the basis of this volume. Contributions deal with the geometry of projective curves and moduli, enumerative and projective geometry, deformation theory (and its applications), homological algebra, algebraic and arithmetic surfaces. The volume closes with a list of 43 problems and questions, with short discussions and related references.

Stochastic and partial differential equations and applications II. — Proceedings of a Conference held in Trento, Italy, February 1-6, 1988. — G. da Prato, L. Tubaro (eds.). — Lecture notes in mathematics, vol. 1390. — Un vol. broché, 16,5 × 24,5 de vi, 258 p. — Prix: DM 45.00. — Springer-Verlag, Berlin, 1989.

These are the proceedings of the 2nd meeting on Stochastic Partial Differential Equations and Applications, the first having been in October 1985. The range of applications of SPDE have become ever wider: filtering theory, biological models, control theory, field theory in physics. They offer new problems and give at the same time hints for the solution. This time, the "Applications" are better represented, although some lectures do not appear in these proceedings because they have been published elsewhere.

Probability measures on groups IX. Proceedings of a Conference held in Oberwolfach, FRG, January 17-23, 1988. — H. Heyer (ed.). — Lecture notes in mathematics, vol. 1379. — Un vol. broché, 16,5 × 24, 5 de viii, 437 p. — Prix: DM 69.00. — Springer-Verlag, Berlin, 1989.

The latest in this series of Oberwolfach conferences focussed on the interplay between structural probability theory and various other areas of pure and applied mathematics such as Tauberian theory, infinite-dimensional rotation groups, central limit theorems, harmonizable processes, and spherical data. Thus it was attended by mathematicians whose research interests range from number theory to quantum physics in conjunction with structural properties of probabilistic phenomena.

Kirti R. SHAH, Bikas K. SINHA. — **Theory of optimal designs.** — Lecture notes in statistics, vol. 54. — Un vol. broché, 16,5 × 24,5 de VIII, 171 p. — Prix : DM 36.00. — Springer-Verlag, Berlin, 1989.

This monograph provides an up-to-date account of exact optimality theory in the area of experimental design. Basic problems and main results are presented in a systematic and unified way. Important ideas and newly developing concepts/tools are emphasized and illustrated. Included with proofs are all the important results that are available at this time.

Josef STOER. — **Numerische Mathematik 1 : eine Einführung — unter Berücksichtigung von Vorlesungen von F.L. Bauer.** — 5., verb. Aufl. — Un vol. broché, 13,5 × 20,5 de XIII, 314 p. — Prix : DM 32.00. — Springer- Verlag, Berlin, 1989.

Dieses zweibändige Standardlehrbuch bietet einem umfassenden und aktuellen Überblick über die numerische Mathematik. Dabei wird viel Wert auf solche Vorgehensweisen und Methoden gelegt, die sich durch grosse Wirksamkeit auszeichnen. Ihr praktischer Nutzen, aber auch die Grenzen ihrer Anwendung werden vergleichend diskutiert. Zahlreiche Beispiele runden dieses unentbehrliche Buch ab.

B.V. GNEDENKO, I.N. KOVALENKO. — **Introduction to queueing theory. 2nd edition, revised and supplemented.** — Translated by S. Kotz. — Mathematical modeling, no. 5. — Un vol. relié, 16 × 24 de XI, 314 p. — Prix : SFr. 108.00. — Birkhäuser, Boston, 1989.

This second edition of the highly regarded introduction to queueing theory by two Soviet experts presents a clear, well-motivated exposition of queueing theory, maintaining a balance between theory and practical application, particularly in the areas of priority queues and systems involving several servers. Many of the proofs from the first edition have been streamlined, discussions of new results have been added, and there is a new chapter on Monte-Carlo simulation. A special feature is the highlighting of Russian and Ukrainian results which are usually not available in English texts.

M. SAMUELIDES, L. TOUZILLIER. — **Analyse fonctionnelle.** — Collection «La Chevêche». — Un vol. relié, 17 × 25, de 289 p. — Prix : FF 210.00. — CEPADUES-Editions, Toulouse, 1989.

Ce livre est le premier tome du cours d'Analyse enseigné à l'ENSAE. C'est un ouvrage à la fois pédagogique et rigoureux qui bénéficie d'une longue expérience d'enseignement. Il est bien adapté au public d'ingénieurs qui est visé. Les bases présentées dans le présent volume (analyse fonctionnelle, espaces fonctionnels, théorie des distributions, analyse spectrale) sont abordées de manière suffisamment complète pour que les étudiants puissent aborder des cours sur les équations aux dérivées partielles, l'analyse numérique, le traitement du signal avec la meilleure préparation possible.

Hans TRIEBEL. — **Analysis und mathematische Physik.** — 3., bearbeitete Auflage. — Un vol. relié, 17,5 × 24, de 451 p. — Prix : SFr. 98.00. — Birkhäuser, Basel, 1989.

Dieses Buch entstand aus einem 10 semerstrigen Kurs, der klassische und moderne Gebiete der Mathematik und der theoretischen Physik in sich vereinte. Zu den mathematischen Disziplinen gehören Differential- und Integralrechnung, gewöhnliche und partielle Differentialgleichungen, spezielle Funktionen, Masstheorie, komplexe Funktionentheorie, Funktionalanalysis, Distributionen und Differentialgeometrie. Zu den physikalischen Fächern gehören klassische Mechanik, Hydrodynamik, Feldtheorie, spezielle und allgemeine Relativitätstheorie, Quantenmechanik und Katastrophentheorie.

The mathematics of surfaces III. — Based on the proceedings of a conference organized by the Institute of Mathematics and its Applications on the Mathematics of Surfaces held at Keble College, Oxford in September 1988. — Edited by D.C. Handscomb. — The IMA conference series, vol. 23. — Un vol. relié, 16 × 24, de 493 p. — Prix: £50.00. — Clarendon Press, Oxford, 1989.

From the preface: "The central purpose of the conference was to present a picture of current activity in Computer-Aided Geometric Design, but we wanted to draw in participants from a variety of academic and industrial fields with an interest in surfaces, and to exchange ideas with them. With this aim in view, we invited a number of selected speakers, from the United Kingdom and overseas, to present lectures on subjects ranging from CAGD and pattern recognition to pure projective and differential geometry."

Dominique de WERRA. — **Éléments de programmation linéaire avec applications aux graphes.** — Un vol. broché, 16 × 24, de XII, 306 p. — Prix: SFr. 64.00. — Presses polytechniques romandes, Lausanne, 1990.

De nos jours, la programmation linéaire est devenue un outil classique largement utilisé dans de nombreuses applications de la technique et de la gestion. S'adressant aux ingénieurs de toutes spécialités ainsi qu'aux mathématiciens orientés vers les applications, cet ouvrage présente les notions de base de la programmation linéaire. Il s'appuie sur des connaissances élémentaires d'algèbre linéaire et il est donc accessible aux étudiants du premier cycle.

Eric REYSSAT. — **Quelques aspects des surfaces de Riemann.** — Progress in mathematics, vol. 77. — Un vol. relié, 16 × 23,5, de VII, 166 p. — Prix: SFr. 58.00. — Birkhäuser, Basel, 1989.

Riemann surfaces are found in several different branches of mathematics. They may be viewed as topological surfaces or analytic manifolds, Puiseux series, or even algebraic curves or function fields. The aim of this book is to give a comprehensive overview, with examples, showing how these different points of view are interconnected. The compact case is treated more extensively, including two different approaches of Riemann-Roch and detailed examples of hyperelliptic and modular curves.

W. BORHO, J.-L. BRYLINSKI, R. MACPHERSON. — **Nilpotent orbits, primitive ideals, and characteristic classes : a geometric perspective in ring theory.** — Progress in mathematics, vol. 78. — Un vol. relié, 16 × 23,5, de VI, 131 p. — Prix: SFr. 54.00. — Birkhäuser, Basel, 1989.

A beautiful circle of ideas in semi-simple Lie algebra theory has recently emerged that relates the classification of primitive ideals to the geometry of nilpotent orbits and the representations of the Weyl group. This book presents this circle of ideas, emphasizing geometry as the unifying principle. New proofs are given for important results of A. Joseph and T. Springer. The book also presents new results involving ring theory, equivariant K-theory and D-modules on flag varieties. The geometric methods used include intersection homology, equivariant K-theory and D-modules.

Ralph McKENZIE, Matthew VALERIOTE. — **The structure of decidable locally finite varieties.** — Progress in mathematics, vol. 79. — Un vol. relié, 16 × 23,5, de VIII, 212 p. — Prix : SFr. 64.00. — Birkhäuser, Basel, 1989.

The text consists of one long proof organized into fifteen separate constructions with auxiliary lemmas. It can be taken as a model of a successful analysis of a very diverse family of nonclassical systems that yields deep results applying to the whole family. It is also the most

substantial extant application of the new structure theory for finite algebras. It will be of interest not only to researchers and students in universal algebra and model theory seeking to master structure theory and to develop further applications, but also to combinatorialists and computer scientists searching for ways to approach the analysis of diverse and complex systems.

P.R. MASANI. — **Norbert Wiener, 1894-1964.** — Vita mathematica, vol. 5. — Un vol. relié, 16 × 23, de 416 p. — Prix: SFr. 98.00. — Birkhäuser, Basel, 1990.

Wiener's pioneering mind was always leagues ahead of its time. As a mathematician and universal thinker he was on par with the greatest of this century. His early fascination for electricity and his training in mathematical logic soon intertwined to yield a profound understanding of the commonality of the functioning of the mind and computer, his conception of the subject of cybernetics, and a penetrating insight of the impending age of automation and automatization in all of its social and educational ramifications. Emphasis is also placed on his considerable interaction with other great minds of his time, as revealed in crucial pieces of heretofore unpublished correspondence.

Algebraische Transformationsgruppen und Invariantentheorie = Algebraic transformation groups and invariant theory. — Edited by Hanspeter Kraft, Peter Slodowy, Tonny A. Springer. — DMV Seminar, vol. 13. — Un vol. broché, 17 × 24, de 211 p. — Prix: SFr. 48.00. — Birkhäuser, Basel, 1989.

T.A. Springer: Aktionen reduktiver Gruppen auf Varietäten. — H. Kraft: Klassische Invariantentheorie: eine Einführung. — F. Knop, H. Kraft, D. Luna, T. Vust: Local properties of algebraic group actions. — F. Knop, H. Kraft, T. Vust: The Picard group of a *G*-variety. — P. Slodowy: Der Scheibensatz für algerbaische Transformationsgruppen. Optimale Einparameteruntergruppen für instabile Vektoren. Zur Geometrie der Bahnen reeller reduktiver Gruppen. — F. Pauer: Normale Einbettungen von sphärischen homogenen Räumen. — M. Kervaire, T. Vust: Fractions rationnelles invariantes par un groupe fini: quelques exemples.

Vesselin PETKOV. — **Scattering theory for hyperbolic operators.** — Studies in mathematics and its applications, vol. 21. — Un vol. relié, 15,5 × 23, de XIV, 373 p. — Prix: £92.75/ Dfl. 190.00. — North- Holland, Amsterdam, 1989.

This monograph presents an approach which can be applied to spaces of both even and odd dimension. The ideas on which the approach is based are connected with the RAGE type theorem, with Enss' decomposition of the phase space and with a time-dependent proof of the existence of the operator *W* which exploits the decay of the local energy of the perturbed and free systems. Some inverse scattering problems for time-dependent potentials, and moving obstacles with an arbitrary geometry, are also treated in the book.

Queueing networks with blocking. — Proceedings of the 1st International Workshop held in Raleigh, North-Carolina, May 20-21, 1988. — Edited by Harry G. Perros, Tayfur Altiok. — Un vol. relié, 16 × 23, de XIII, 357 p. — Prix: £92.00/Dfl. 175.00. — North-Holland, Amsterdam, 1989.

The increasing interest in queueing networks with blocking is mainly due to the fact that these models arise naturally in computer systems, communication systems and production systems. This volume presents research consisting of theoretical developments and practical applications. Scientists and practitioners in the areas of computer science, industrial engineering, operations research and management science can benefit from the material collected here.

John C. MORGAN II. — **Point set theory. Pure and applied mathematics, vol. 131.** — Un vol. relié, 16 × 23,5, de VIII, 279 p. — Prix: $99.75 (USA et Canada), $119.50 (Autres pays). — Marcel Dekker, Inc., New York, 1990.

Investigations by Baire, Lebesgue, Hausdorff, Marczewski, and others have culminated in various schemes for classifying point sets. This reference text brings together in a single theoretical framework the properties common to these classifications. This book utilizes the axiomatically determined notion of a category base for extending general topological theorems to a higher level of abstraction... axiomatically unifies analogies between Baire category and Lebesgue measure... enhances understanding of the material with numerous examples and discussions of abstract concepts ... etc.

Number theory: a seminar held at the Graduate School and University Center of the City University of New York 1985-88. — D.V. Chudnovsky, G.V. Chudnovsky, H. Cohn, M.B. Nathanson, editors. — Lecture notes in mathematics, vol. 1383. — Un vol. broché, 16,5 × 24,5 de V, 256 p. — Prix: DM 45.00. — Springer, Berlin, 1989.

The New York Number Theory Seminar was organized in 1982 to provide a forum for the presentation and discussion of recent advances in higher arithmetic and its applications. Papers included in this volume are based on the lectures presented by their authors at the Seminar at the Graduate Center of CUNY in 1985-88. Papers in this volume cover a wide spectrum of number theoretic topics ranging from additive number theory and diophantine approximations to algebraic number theory and relations with algebraic geometry and topology.

Relativistic fluid dynamics. — Lectures given at the 1st 1987 Session of the Centro Internazionale Matematico Estivo (CIME) held at Noto, Italy, May 25-June 3, 1987. — A. Anile, Y. Choquet-Bruhat, editors. — Lecture notes in mathematics, vol. 1385. — Un vol. broché, 16,5 × 24,5 de V, 308 p. — Prix: DM 45.00. — Springer, Berlin, 1989.

In recent years, the subject of relativistic fluid dynamics has found substantial applications in astrophysics and cosmology as well as in plasma physics and nuclear physics. Modern methods of analysis and differential geometry have now also been introduced. The main lecture courses introduced the most significant aspects of the subject and were delivered by leading specialists.

Robert SILHOL. — **Real algebraic surfaces.** — Lecture notes in mathematics, vol. 1392. — Un vol. broché, 16,5 × 24,5 de X, 215 p. — Prix: DM 37.00. — Springer, Berlin, 1989.

Although other problems are also considered, these notes are centred on one question: Given a real algebraic surface determine the topology of the real part. The author systematically answers this question, for all surfaces of special type (i.e. not of general type) in the Enriques-Kodaira classification. All the situations encountered are illustrated by explicit examples. The methods used were essentially developped in the last 10-15 years, notably by Gudkov, Rokhlin, Kharlamov, Viro, Krasnov and the author, but some are older, in particular those of Comesatti.

Séminaire de théorie du potentiel, Paris, no. 9. — N. Bouleau, D. Feyel, F. Hirsch, G. Mokobodzki, editors. — Lecture notes in mathematics, vol. 1393. — Un vol. broché, 16,5 × 24,5 de VI, 265 p. — Prix: DM 45.00. — Springer, Berlin, 1989.

Several contributions of this work relate to recent improvements of typical problems or concepts in potential theory like regularity at the boundary, weak Neumann problems, Green potentials, cones, semigroups, fine topology and harmonic spaces. Two studies of the Schrödinger operator, a paper on stochastic differentials, the problem of the cloud of ice, are

examples of use of potential theoretical tools in different areas. One survey article on the work of the late Marcel Brelot is also included.

Nonlinear semigroups, partial differential equations and attractors. — Proc. of a symposium held in Washington, D.C., August 3-7, 1987. — T.L. Gill, W.W. Zachary, editors. — Lecture notes in mathematics, vol. 1394. — Un vol. broché, 16,5 × 24,5 de IX, 233 p. — Prix: DM 37.00. — Springer, Berlin, 1989.

The papers in this volume come from authors with wide-ranging interests in analytical, topological and numerical aspects of nonlinear partial differential equations. Most are research papers using methods involving nonlinear semigroups.

Number theory, Madras 1987. — Proceedings of the International Ramanujan Centenary Conference held at Anna University, Madras, India, Dec. 21, 1987. — K. Alladi, editor. — Lecture notes in mathematics, vol. 1395. — Un vol. broché, 16,5 × 24,5 de VII, 234 p. — Prix: DM 37.00. — Springer, Berlin, 1989.

These are the proceedings of a symposium on number theory that was held on the final day of the celebration of Srinivasa Ramanujan's centenary. The papers cover many areas of number theory and special functions to which Ramanujan made significant contributions, namely, partitions, additive number theory, probabilistic number theory, arithmetical functions, modular forms, continued fractions, infinite series and beta integrals. Many papers announce new results stemming from Ramanujan's ideas, while others describe Ramanujan's work against a historical background.

Quantum probability and applications IV. — Proceedings of the Year of Quantum Probability, held at the University of Rome II, Italy, 1987. — L. Accardi, W. von Waldenfels, editors. — Lecture notes in mathematics, vol. 1396. — Un vol. broché, 16,5 × 24,5 de VI, 355 p. — Prix: DM 61.00. — Springer, Berlin, 1989.

This volume, the fourth of the quantum probability series, collects part of the contributions to the Year of Quantum Probability organized by the Volterra Center of the University of Rome II. The intensive communication among researchers during this year allowed several open problems to be solved and several unexpected connections to be revealed.

Numerical analysis and parallel processing. — Lectures given at the Lancaster Numerical Analysis Summer School 1987. — P.R. Turner, editor. — Lecture notes in mathematics, vol. 1397. — Un vol. broché, 16,5 × 24,5 de VI, 264 p. — Prix: DM 45.00. — Springer, Berlin, 1989.

This volume contains lecture notes for most of the major courses of lectures presented at the meeting; they cover topics in parallel algorithms for large sparse linear systems and optimization, an introductory survey of level-index arithmetic and superconvergence in the finite element method.

Judith N. CEDERBERG. — **A course in modern geometries.** — Undergraduate texts in mathematics. — Un vol. relié, 16 × 24 de XII, 232 p. — Prix: DM 88.00. — Springer, Berlin, 1989.

The major emphasis of this text is on the geometries developed after Euclid's "Elements" (circa 300 B.C.). In addition to the primary goal of studying these "newer" geometries, this study provides an excellent opportunity to explore aspects of the history of mathematics. Also, since algebraic techniques are frequently used, this study demonstrates the interaction of several areas of mathematics and serves to develop geometrical insights into mathematical results which previously appeared to be completely abstract in nature.

Alain BAILLE, Philippe CAPERAA, Bernard VAN CUTSEM. — **Méthodes et modèles en statistique non paramétrique: exercices et compléments.** — Un vol. broché, 15,5 × 24, de XII, 384 p. — Prix: FF 180.00. — Dunod, Paris et Presses de l'Université de Laval, 1989.

Destiné aux étudiants du 2ᵉ cycle universitaire qui suivent un enseignement de Mathématiques appliquées ou de Statistique, ce livre propose un ensemble d'exercices accompagnés de leurs solutions. Les auteurs ont conçu cet ouvrage à partir du volume précédent («Exposé fondamental») en reprenant l'ordre des différents chapitres et en développant certains exemples déjà utilisés sous une forme abrégée. Complément indispensable du cours, ce recueil peut aussi être abordé directement.

Norman L. BIGGS. — **Discrete mathematics.** — Revised edition. — Oxford Science Publications — Un vol. broché, 15,5 × 23,5 de XIV, 480 p. — Prix: £17.50 (broché)/£40.00 (relié). — Oxford University Press, Oxford, 1989.

This text is a comprehensive course of discrete mathematics. The approach is a traditional deductive one and can be approached by anyone with basic competence in arithmetic and experience of simple algebraic manipulations. Students seeking a first approach to graph theory, combinatorics, number theory, coding theory, combinatorial optimization, and abstract algebra will find a clear introduction to these more specialized fields. The main changes to this new edition are to present descriptions of numerous algorithms in a form close to that of a real programming language. The aim is to enable students to develop practical programs from the design of algorithms.

Advances in homotopy theory. — Proceedings of a conference in honour of the 60th birthday of I.M. James. — Edited by S.M. Salamon, B. Steer, W.A. Sutherland. — London Mathematical Society lecture note series, vol. 139. — Un vol. broché, 15 × 22,5, de XIII, 177 p. — Prix: £15.00 / US$27.95. — Cambridge University Press, Cambridge, 1989.

This volume records the lectures given at a conference to celebrate Professor Ioan James' 60th birthday. Ioan James has made significant contributions to homotopy theory, highlighting problems and initiating new methods. The present volume contains papers from internationally distinguished research workers which lead on from recent and exciting breakthroughs. It will be important for all homotopy theorists as both a statement of current research and as a signpost for new directions.

William P. ZIEMER. — **Weakly differentiable functions.** — Graduate texts in mathematics, vol. 120. — Un vol. relié, 16 × 24,5, de XVI, 308 p. — Prix: DM 108.00. — Springer-Verlag, Berlin, 1989.

Sobolev functions and functions of bounded variation (BV functions) possess only weak partial derivatives (in the sense of distributions) and therefore are not, in general, differentiable or even continuous. When these properties are absent, however, there are various concepts from real analysis such as Lebesgue points, approximate continuity, and approximate differentiability that are available as interesting and useful substitutes. The major thrust of this book is to investigate the pointwise behavior of Sobolev and BV functions in the context of this framework from real analysis.

David M. BRESSOUD. — **Factorization and primality testing.** — Undergraduate texts in mathematics. — Un vol. relié, 16 × 24,5, de XIII, 237 p. — Prix: DM 98.00. — Springer-Verlag, Berlin, 1989.

This book focuses on a single problem: how to factor a large integer or prove it is prime. From the sieve of Eratosthenes of ancient Greece to the multiple polynomial quadractic sieve and the elliptic curve methods discovered in the past few years, this self-contained text provides a survey of the heritage and an introduction to the current research in this field. It can also be used as an introduction to number theory and has the advantage over most texts in this area of being built around a unifying theme. With a strong emphasis on algorithms, it encourages learning through computation and experimentation.

Ole E. Barndorff-Nielsen, Preben Blaesild, Poul Svante Eriksen. — **Decomposition and invariance of measures, and statistical transformation models.** — Lecture notes in statistics, vol. 58. — Un vol. broché, 16,5 × 24, de v, 147 p. — Prix: DM 36.00. — Springer-Verlag, Berlin, 1989.

From the preface: ''The theory of decomposition and invariance of measures provide essential tools for the study of transformation models. While the major aspects of that theory are treated in a number of mathematical monographs, mostly as part of much broader contexts, we have found no single account in the literature which is sufficiently comprehensive for statistical purposes. This volume aims to fill the gap ...''

Sudhir Gupta, Rahul Mukerjee. — **A calculus for factorial arrangements.** — Lecture notes in statistics, vol. 59. — Un vol. broché, 16,5 × 24, de vi, 126 p. — Prix: DM 30.00. — Springer-Verlag, 1989.

This monograph presents a Kronecker calculus for factorial arrangements. The authors provide an integrated overview of the most important developments on the characterization and construction problems related to the calculus. They also present a fresh view of the traditional results in this area and deal with the unification of such results using the calculus.

A.M. Perelomov. — **Integrable systems of classical mechanics and Lie algebras, vol. 1.** — Translated from the Russian by A.G. Reyman. — Un vol. relié, 17 × 24, de x, 307 p. — Prix: SFr. 138.00. — Birkhäuser Verlag, Basel, 1990.

The book focuses mainly on the development and applications of the isospectral deformation method and also gives a fairly complete survey of the older classic results. It contains the necessary background material and outlines the isospectral deformation method in a Lie-algebraic form..., gives an account of numerous previously known integrable systems..., deals with many body systems of generalized Calogero-Moser type related to root systems of simple Lie algebras. One chapter is devoted to the Toda lattice and its various modifications seen from the group-theoretic point of view. The last chapter investigates some additional topics related to many-body systems.

Richard Courant, Fritz John. — **Introduction to calculus and analysis.** — Second printing. — 2 vol. reliés, 16 × 24,5, de xxiii, 661 p. et xxv, 954 p. — Prix: DM 96.00 (vol. 1), DM 126.00 (vol. 2). — Springer-Verlag, Berlin, 1989.

Contents of vol. 1: Introduction. The fundamental ideas of the integral and differential calculus. The techniques of calculus. Applications in physics and geometry. Taylor's expansion. Numerical methods. Infinite sums and products. Trigonometric series. Differential equations for the simplest types of vibration. List of biographical dates. Index. *Contents of vol. 2:* Functions of several variables and their derivatives. Vectors, matrices, linear transformations. Developments and applications of the differential calculus. Multiple integrals. Detailed analysis of the process of integration. Relations between surface and volume integrals. General theory of

surfaces and of surface integrals. Differential equations. Calculus of variations. Functions of a complex variable. List of biographical dates. Index.

Set theory and its applications. — Proceedings of a conference, held at York University, Ontario, Canada, Aug. 10-21, 1987. — Edited by J. Steprans, S. Watson. — Lecture notes in mathematics, vol. 1401. — Un vol. broché, 16,5 × 24, de v, 227 p. — Prix: DM 37.00 — Springer- Verlag, Berlin, 1989.

From the contents: "The conference featured contributed talks and invited lectures on topics central to the study of set theory and its applications, particularly to general topology... All of the articles in this volume have been refereed."

M.A. KRASNOSEL'SKIJ, Je. A. LIFSHITS, A.V. SOBOLEV. — **Positive linear systems : the method of positive operators.** — Sigma series in applied mathematics, vol. 5. — Un vol. broché, 24 × 17, de VII, 354 p. — Prix: DM 88.00. — Heldermann Verlag, Berlin, 1989.

The method is concerned with methods for studying systems and problems whose mathematical description leads to equations involving positive (with respect to some partial ordering) operators. The first chapter introduces the basic notions. The second one presents applications to spectral problems. The third, some iteration procedures and methods for obtaining estimates for spectral radii and spectral margins, and a posteriori estimates in eigenvector problems. The last chapter is concerned with some applications to forced oscillation problems in automatic -control systems.

E.-A. BEHRENS. — **Arithmetical completely simple semigroups.** — Research and exposition in mathematics, vol. 17. — Un vol. broché, 17 × 24, de VII, 135 p. — Prix: DM 48.00. — Heldermann Verlag, Berlin, 1989.

To develop a non-commutative arithmetic for partially ordered semigroups the author has defined arithmetical completely simple semigroups and applies them to the integral normal ideals in the central simple algebras Q over the quotient field of a Dedekind ring under a generalized multiplication. On the set I of the maximal orders in Q he introduces a partial order relation, the finer properties of which describe the arithmetic of Q.

Ryszard ENGELKING. — **General topology.** — Revised and completed edition. — Un vol. relié, 18 × 24,5, de VIII, 529 p. — Prix: DM 148.00. — Heldermann Verlag, Berlin, 1989.

Introduction. — Topological spaces. — Operations on topological spaces. — Compact spaces. — Metric and metrizable spaces. — Paracompact spaces. — Connected spaces. — Dimension to topological spaces. — Uniform spaces and proximity spaces. — Bibliography. — Tables. The purpose of this new edition is to update the original edition in the light of current research. Important new results related to topics discussed in the first edition were added, as were some older results which have recently been proved to be important. Some errors and inaccuracies were corrected, several proofs simplified, historical and bibliographic notes were completed and references to the recent literature were added. As the result of all these changes, the bibliography was enlarged by some 130 items.

John STILLWELL. — **Mathematics and its history.** — Undergraduate texts in mathematics. — Un vol. relié, 16 × 24,5, de X, 371 p. — Prix: DM 98.00. — Springer-Verlag, Berlin, 1989.

This book presents a concise unified view of mathematics and its historical development from ancient times down to the 20th century. It is aimed at senior undergraduates, or other

mathematicians, who have mastered the basic topics but whish to gain a better grasp of mathematics as a whole. The emphasis is on history as a method for unifying and motivating mathematics, rather than as an end in itself, and there is more mathematical detail than in other general histories.

Recent topics in nonlinear PDE IV. — Edited by Masayasu Mimura, Takaaki Nishida. — North-Holland mathematics studies, vol. 160. — Lecture notes in numerical and applied analysis, vol. 10. — Un vol. broché, 16 × 24, de US$97.50/Dfl. 190.00. — North-Holland, Amsterdam, 1989.

These are the proceedings of a Meeting on Nonlinear Partial Differential Equations (PDEs) which was held at Research Institute of Mathematical Sciences, Kyoto University, from January 6-9, 1988. This volume concerns the theory and applications of nonlinear PDEs in mathematical physics, reaction- diffusion theory, biomathematics, and other applied sciences. Twelve papers present recent work in analysis, computational analysis of nonlinear PDEs and their applications.

S.N. ANTONTSEV, A.V. KAZHIKHOV and V.N. MONAKHOV. — **Boundary value problems in mechanics of nonhomogeneous fluids.** — Studies in mathematics and applications, vol. 22. — Un vol. relié, 16 × 23, de XIV, 310 p. — Prix: US$85.25/Dfl. 175.00. —. North-Holland, Amsterdam, 1990.

The investigations involve the results concerning Navier-Stokes equations of viscous heat-conductive gas, incompressible nonhomogeneous fluid and filtration of multi-phase mixture in a porous medium. The correctedness of the initial boundary-value problems and the qualitative properties of solutions are also considered.

J.F. HUMPHREYS, M.Y. PREST. — **Numbers, groups and codes.** — Un vol. broché, 15 × 23, de XVI, 288 p. — Prix: £30.00 (relié)/£10.95 (broché). — Cambridge University Press, Cambridge, 1989.

The aim of this textbook is to introduce the concepts of algebra, especially group theory, by many examples and to relate them to their applications, particularly in computer sciences. The books which were considered for the course seemed to fall into two categories: some were too elementary, proceeded at too slow a pace and did not provide for adequate coverage of the topics the authors wished to include. Others were aimed at a higher level and were more comprehensive, but had correspondingly skimpy presentation of the material. This book is the result of the authors' own course notes to bridge the gap between the two extremes.

Johannes KEPLER. **De coni sectionibus** — Über die Kegelschnitte. — Lateinisch und deutsch. — Hrsg. und übers. von Thomas Dittert. — Un vol. broché, 14,5 × 21, de 62 p. — Prix: DM 19.00. — Thomas Dittert Buchhandlung, Baunatal, 1990.

Kepler's "Ad Vitellionem paralipomena" of 1604, a milestone in the history of geometrical optics, contain an original discourse on conic sections. Although he refers to Apollonius and Eutocius, his study is quite distinct from the treatment of conic sections found in the work of his predecessors. The related section of Kepler's "Messekunst Archimedis" of 1616, written in his vigorous vernacular German, treats the same subject from a more popular point of view.

Kenneth FALCONER. — **Fractal geometry : mathematical foundations and applications.** — Un vol. relié, 16 × 23,5, de XXII, 288 p. — Prix: £19.95. — John Wiley and Sons, Chichester, 1990.

This book provides an accessible treatment of the mathematics of fractals and their dimensions. It is aimed at those wanting to use fractals in their own areas of mathematics or science. The first part of the book covers the general theory of fractals and their geometry. Results are stated precisely, but technical measure theoretic ideas are avoided and difficult proofs are sketched or omitted. The second part contains a variety of examples and applications in mathematics and physics.

Alexander S. KECHRIS, Alain LOUVEAU. — **Descriptive set theory and the structure of sets of uniqueness.** — London Mathematical Society lecture note series, vol. 128. — Un vol. broché, 15,5 × 22,5, de 367 p. — Prix: £22.50/US$37.50. — Cambridge University Press, Cambridge, 1987, reprinted 1989.

The study of sets of uniqueness for trigonometric series has a long history. In this book are developed the connections that the subject has with descriptive set theory. These have only been discovered recently and the authors present here this novel theory which leads to many new results concerning the structure of sets of uniqueness and include solutions to some of the classical problems in this area.

Robert OLIVER. — **Whitehead groups of finite groups.** — London Mathematical Society lecture note series, vol. 132. — Un vol. broché, 15,5 × 22,5, de 349 p. — Prix: £22.50/US$34.50. — Cambridge University Press, Cambridge, 1988.

This book's aim is to make accessible techniques for studying Whitehead groups of finite groups, as well as a variety of related topics such as induction theory and p-adic logarithms. The author has included a lengthy introduction to set the scene for non-specialists who want an overview of the field, its history and its applications. The rest of the book consists of tree parts: general theory, group rings of p-groups and general finite groups.

Hans Joachim BAUES. — **Algebraic homotopy.** — Cambridge studies in advanced mathematics, vol. 15. — Un vol. relié, 16 × 23,5, de XIX, 466 p. — Prix: £65.00/US$89.50. — Cambridge University Press, Cambridge, 1989.

This book gives a general outlook on homotopy theory; fundamental concepts, such as homotopy groups and spectral sequences, are developed from a few axioms and are thus available in a broad variety of contexts. Many examples and applications in topology and algebra are discussed, including an introduction to rational homotopy theory in terms of both differential Lie algebras and De Rham algebras. The author describes powerful new tools for homotopy classification problems, in particular for the classification of homotopy types and for the computation of the group homotopy equivalences. Applications and examples of such computations are given, including when the fundamental group is non-trivial. The deep connection between the homotopy classification problems and the cohomology theory of small categories is demonstrated.

A.G. HAMILTON. — **Linear algebra: an introduction with concurrent examples.** — Un vol. broché, 15 × 23, de VIII, 328 p. — Prix: £35.00 (relié)/£11.95 (broché). — Cambridge University Press, Cambridge, 1989.

This book is a readable introduction to linear algebra, starting at an elementary level. It is intended to be useful both for students of pure mathematics who may subsequently pursue more advanced study in this area and for students who require linear algebra and its applications in other subjects in preference to more theoretical aspects. The book has worked examples on every left-hand page concurrently with the text on the right-hand page.

Groups — Korea 1988 : proceedings of a Conference on Group Theory, held in Pusan, Korea, August 15-21, 1988. — Edited by A.C. Kim, B.H. Neumann. — Lecture notes in mathematics, vol. 1398. — Un vol. broché, 16,5 × 24, de v, 189 p. — Prix: DM 30.00. — Springer-Verlag, Berlin, 1989.

From the contents: S. Bachmuth, H.Y. Mochizuki: Infinite generation of automorphism groups. — N. Gupta: Higher dimension subgroups. — N. Ito: Doubly regular asymmetric digraphs with rank 5 automorphism groups. — J.L. Mennicke: On Fibonacci groups and some other groups. — P.M. Neumann: Pathological representations of infinite soluble groups. — S.J. Pride: Some problems in combinatorial group theory. — A.H. Rhemtulla: Groups with many elliptic subgroups. — D.J.S. Robinson: Reflection on the construction theory of polycyclic groups.

Arithmetic of complex manifolds: proceedings of a Conference held in Erlangen, FRG, May 27-31, 1988. — Edited by W.-P. Barth, H. Lange. — Lecture notes in mathematics, vol. 1399. — Un vol. broché, 16,5 × 24, de v, 171 p. — Prix: DM 30.00. — Springer-Verlag, Berlin, 1989.

It was the aim of the Erlangen meeting in May 1988 to bring together number theoretists and algebraic geometers to discuss problems of common interest, such as moduli problems, complex tori, integral points, rationality questions, automorphic forms. This proceedings volume contains 12 original research papers. Its main topics are theta functions, modular forms, abelian varieties and algebraic three-folds.

Combinatorial optimization: lectures given at the 3rd Session of the Centro Internazionale Matematico Estivo (C.I.M.E.), held at Como, Italy, August 25-September 2, 1986. — Edited by B. Simeone. — Lecture notes in mathematics, vol. 1403. — Un vol. broché, 16,5 × 24, de v, 136 p. — Prix: DM 53.00. — Springer-Verlag, Berlin, 1990.

Situated between combinatorics, computer science and operations research, the subject draws on a variety of mathematical methods to deal with problems motivated by real-life applications. This C.I.M.E. Summer School's activity centered on the 4 main lecture courses, the notes of which are included in this volume: P.L. Hammer and B. Simeone: Quadratic functions of binary variables. — E.L. Johnson: On binary group problems having the Fulkerson property. — O. Goecke, B. Korte and L. Lovasz: Examples and algorithmic properties of greedoids. — E.L. Lawler: Combinatorial structures and combinatorial optimization.

Analytic theory of continued fractions III : proceedings of a Seminar-Workshop, held in Redstone, USA, 17 June 26-July 5, 1988. — Ed. by L. Jacobsen. — Lecture notes in mathematics, vol. 1406. — Un vol. broché, 16,5 × 24, de vi, 142 p. — Prix: DM 25.00. — Springer-Verlag, Berlin, 1989.

From the preface: "This time analysis of papers from the turn of the century was one of the issues. Mathematicians like Helge von Koch, Jan Sleszynski and Julius Worpitzky had results and arguments which still deserve attention. Indirectly, these studies led to the study of separate convergence, a topic presented in a survey article in this volume, and to a historical article on Julius Worpitzky. In addition we continued discussions on nearness problems, the connection of Padé approximants, and applications to number theory and differential equations..."

Wolfram POHLERS. — **Proof theory: an introduction.** — Lecture notes in mathematics, vol. 1407. — Un vol. broché, 16,5 × 24, de vi, 213 p. — Prix: DM 37.00. — Springer-Verlag, Berlin, 1989.

The heart of the book is the ordinal analysis of axiom systems, with particular emphasis on that of the impredicative theory of elementary inductive definitions on the natural numbers. The "constructive" consequences of ordinal analysis are sketched out in the epilogue. The book sets out to give a self-contained treatment assuming no prior knowledge of proof theory and almost none of logic.

D.G. DE FIGUEIREDO. — **Lectures on the Ekeland variational principle with applications and detours.** — Tata Institute of Fundamental Research lectures on mathematics, vol. 81. — Un vol. broché, 17,5 × 24, de VI, 96 p. — Prix: DM 20.00. — Springer-Verlag, Berlin, 1989.

Since its publication in 1972, the variational principle of Ekeland has found many applications in different fields of analysis. Some are very scattered in the literature and therein lies the motivation of these notes. They are intended for the use of students and therefore include several detours through related material.

Michael VAUGHAN-LEE. — **The restricted Burnside problem.** — London Mathematical Society monographs. New series, vol. 5. — Un vol. relié, 16 × 24, de XIII, 209 p. — Prix: £27.50. — Clarendon Press, Oxford, 1990.

There have been a number of developments in the understanding of the restricted Burnside problem since Kostrikin's 1959 solution of the problem for prime exponent. The author's objective is to provide a treatment of the restricted Burnside problem which has some of these new developments as its starting point. This book is intended to be accessible to a postgraduate student in mathematics with a good grounding in group theory, ring theory, and linear algebra.

Handbook of numerical analysis. Vol. 1: Finite difference methods (Part 1)/Solution of equations in R^n (Part 1). — General editors: P.G. Ciarlet, J.L. Lions. — Un vol. relié, 17 × 24,5 de VII, 652 p. — Prix: US$ 107.25/Dfl. 220.00. — North-Holland, Amsterdam, 1990.

This is the first in a series of volumes which will cover all the major aspects of numerical analysis, serving as the basic reference work on the subject. Each volume will concentrate on one, or two, particular topics and will be essentially self-contained. Each article, written by an expert, is an in-depth survey, reflecting the most recent trends in the field. The handbook will cover the basic methods of numerical analysis, under the following general headings: solution of equations in R^n, finite difference methods, finite element methods, techniques of scientific computing, optimization theory and systems science. It will also cover the numerical solution of actual problems of contemporary interest in applied mathematics, under the following headings: numerical methods for fluids, numerical methods for solids, specific applications including meteorology, seismology, petroleum mechanics, celestial mechanics, etc.

Symmetries of partial differential equations: conservation laws, applications, algorithms. — Ed. by A.M. Vinogradov. — Reprinted from "Acta applicandae mathematicae", vol. 15, Nos. 1 & 2 and Vol. 16, Nos. 1 & 2. — Un vol. relié, 16,5 × 24,5 de VI, 242 p. — Prix: DFl. 250.00/US$ 129.00. — Kluwer Academic Publishers, Dordrecht, 1989.

Prior to the publication of this book, the higher symmetries and conservation laws, together with similar strong results, were only known for partial differential equations with two independent variables. The first part of this work deals with the problem of how to find all higher symmetries and conservation laws for a given differential equation, illustrated by the equations of mathematical physics, most of them having more than two independent variables. In the second part, one can find some constructions of systems that are "integrable" (in a sense), leading to the derivation of interesting relations between the two concepts of "integrability" and

"symmetry". The section closes with a discussion of some methods for modelling continuum media based on symmetry considerations.

Thomas J. SANTNER, Diane E. DUFFY. — **The statistical analysis of discrete data.** — Springer texts in statistics. — Un vol. relié, 16 × 24 de XII, 367 p. — Prix: DM 88.00. — Springer, Berlin, 1989.

This book provides an introduction to methods for analyzing discrete data. The text covers both single-sample problems and problems with structured means which can be studied via loglinear and logistic models. Standard estimation and testing formulations are joined by formulations in terms of multiple comparisons, simultaneous interval construction, and ranking and selection. Where possible, connections with linear model theory for continuous responses are exploited to emphasize the relationships between the two areas.

M.P. HEBLE. — **Approximation problems in analysis and probability.** — North-Holland mathematics studies, vol. 159. — Un vol. broché, 17 × 24,5 de XII, 246 p. — Prix: US$92.00/ Dfl. 175.00. — North- Holland, Amsterdam, 1989.

This is an exposition of some special results on analytic or C(infinite)- approximation of functions in the strong sense, in finite- and infinite- dimensional spaces. It starts with H. Whitney's theorem on strong approximation by analytic functions in finite-dimensional spaces and ends with some recent results by the author on strong C(infinite)-approximations of functions defined in a separable Hilbert space. The volume also contains some special results on approximation of stochastic processes. The results explained in the book have been obtained over a span of nearly five decades.

Thomas A. GRANDINE. — **The numerical methods programming projects book.** — Oxford science publications. — Un vol. broché, 15,5 × 23,5 de VIII, 146 p. — Prix: £25.00 (relié)/£9.95 (broché). — Oxford University Press, Oxford, 1990.

Traditional numerical analysis books concentrate either on the mathematical or programming aspects of numerical algorithms. This textbook is different inasmuch as it emphasizes the relevance of these techniques to the real world and the use of a widely available library of numerical software in their application. The book consists of 22 carefully graded projects which will lead the reader through the techniques typically taught as part of a first- course in numerical analysis. Throughout, the reader is presented with projects which reflect very real problems that occur in science and industry.

Miguel de GUZMAN. — **Aventures mathématiques.** — Traduit de l'espagnol par Elisabeth Schmitt. — Collection «Réflexions sur les sciences et les techniques». — Un vol. broché, 16 × 24, de IX, 172 p. — Prix. SFr. 46.00. — Presses polytechniques et universitaires romandes, Lausanne, 1989.

Les jeux ont de tout temps été un centre d'intérêt pour les mathématiciens, célèbres ou non, qu'ils les aient conçus ou qu'ils s'en soient amusés. Les essais que ce livre présente mettent en relief la veine ludique des mathématiques. Il s'agit en fait de montrer quelques notions très simples et intuitives. Cet ouvrage s'adresse à un large public de mathématiciens ou plus généralement de scientifiques et de curieux.

Julian Lowell COOLIDGE. — **The mathematics of great amateurs.** — Second edition, with an introductory essay by Jeremy Gray. — Un vol. broché, 15,5 × 23,5 de XXIV, 211 p. — Prix: £17.50. — Clarendon Press, Oxford, 1990.

This book is something of a classic in the literature of the history of mathematics. It deals not with the men and women who made mathematics their life and work but with those significant figures who were primarily known for some other activity yet whose contributions to mathematics were of permanent value. First published in 1949, it remains a valuable and scholarly introduction to these figures. Inevitably, modern scholarship has thrown new light on the subjects of this book. Rather than disrupt the overall flow of the book which is reproduced here unchanged, Jeremy Gray has provided a short biographical note about Coolidge and an introductory essay which discusses where new historical and mathematical material is now available.

Séminaire de théorie des nombres, Paris 1987-88. — Ed. by Catherine Goldstein. — Progress in mathematics, vol. 81. — Un vol. relié, 15,5 × 23,5 de VIII, 350 p. — Prix: SFr. 84.00. — Birkhäuser, Boston, 1990.

This is the eighth annual volume of papers based on lectures given at the Séminaire de théorie des nombres de Paris in 1987-88, including some additional papers of widespread interest. The results presented here by an international group of mathematicians reflect recent work in many areas of number theory and should form a basis for further discussion of these topics.

Soliton theory: a survey of results. — Ed. by Allan P. Fordy. — Nonlinear science: theory and applications. — Un vol. relié, 16 × 24, de VII, 449 p. — Prix: £65.00. — Manchester University Press, Manchester, 1990.

This book reviews the most important topics of current research interest and also contains some basic soliton theory. The text deals with solution methods including Hirota's method and Bäcklund transformations. It describes in detail physical applications of soliton theory with chapters on the peculiar wave patterns of the Andaman Sea, general relativity, atmospheric phenomena and Davydov solitons. Among the algebraic and geometrical structures considered are Lie algebras and symmetric space and Kac-Moody algebras. Testing for complete integrability is dealt with and discussion of the Painlevé method and symmetries and conservation laws is included.

H. TAKAYASU. — **Fractals in the physical sciences.** — Nonlinear science: theory and applications. — Un vol. relié, 16 × 24, de IX, 170 p. — Prix: £35.00. — Manchester University Press, Manchester, 1990.

The theory of fractals is one of the most important developments in natural science today. It is used to describe complicated, irregular shapes in nature by introducing a new quantity called the fractal dimension. This revolutionary theory has been applied in many fields ranging from molecular physics to the large-scale structure of the universe, and provides new conceptual tools and insights. This textbook begins with an elementary introduction to fractals and progresses to deal with more sophisticated problems, using many examples. Computer simulated fractals are also introduced. Advanced theoretical topics are included, such as chaos, percolation, statistical models of turbulence, and renormalisation group methods.

Disorder in physical systems: a volume in honour of John M. Hammersley. — Ed. by G.R. Grimmett and D.J.A. Welsh. — Oxford science publications. — Un vol. relié, 15 × 24, de X, 378 p. — Prix: £35.00. — Clarendon Press, Oxford, 1990.

De la préface: "...If one must single out one particular area where Hammersley's contribution has proved especially vital, it would probably be the study of random processes in space. He

was a pioneer in this field ... The principal theme of this volume reflects various aspects of Hammersley's work in the area, including disordered media, subadditivity, numerical methods and the like.''

Catherine LANG-MICHAUT. — **Pratique des tests statistiques: interprétation des mesures.** — Un vol. broché, 17,5 × 25,3 de 140 p. — Prix: FF 120.00. — Dunod, Paris, 1990.

Quel que soit son domaine d'activité, l'expérimentateur doit souvent prendre une décision à partir d'un nombre limité de résultats. Aussi fait-il appel aux tests statistiques, afin d'interpréter ses données. Cet ouvrage présente les tests les plus utilisés, dont le SPC (Statistical Process Control), sous forme de tables statistiques. Pour chaque table, l'utilisateur non- spécialiste trouvera la méthodologie du test, les conseils et les mises en garde pour son application ainsi que des exemples numériques. En fin d'ouvrage une étude de cas introduit progressivement tous les tests présentés. Ce livre souligne l'importance de l'interprétation des résultats dans la prise de décision finale, notamment dans une démarche de «qualité».

Leonard EULER. — **Introduction to the analysis of the infinite. Book II.** — Translated by John D. Blanton. — Un vol. relié, 16 × 24, de XII, 504 p. — Prix: DM 118.00. — Springer-Verlag, Berlin, 1990.

The second book includes those things which must be known from geometry, since analysis is ordinarily developed in such a way that its application to geometry is shown. It is about higher plane curves with an appendix on surfaces. The intended audience consists of historians of mathematics, algebraic geometers, and academic libraries.

Dénes KOENIG. — **Theory of finite and infinite graphs.** — Un vol. relié, 15,5 × 23,5 de 426 p. — Prix: SFr. 148.00. — Birkhäuser Verlag, Boston, 1990.

Originally published in 1936 by the Hungarian mathematician Dénes König, this was the first book on graph theory and for two decades remained the only book on the subject. Now available in English for the first time, the book is not only of historical interest, but also provides an excellent introduction to a subject that has become increasingly important in recent years, largely due to its many applications to computer science.

Richard L. EPSTEIN. — **The semantic foundations of logic. Vol. 1: Propositional logics.** — Nijhoff International Philosophy Series, vol. 35. — Un vol. relié, 16,5 × 24,5 de XXII, 386 p. — Prix: Dfl. 195.00/US$99.00/£69.00. — Kluwer Academic Publishers, Dordrecht, 1990.

This is the first book to present the history, philosophy, and mathematics of the major systems of modern propositional logics. Classical logic, modal logics, many-valued logics, intuitionism, paraconsistent logics, and analytic implication are each examined in separate chapters. The view that unifies the exposition is that these logics comprise a spectrum: as the aspects of propositions under consideration is varied, the logic varies. A general framework for semantics for propositional logics is proposed, and each logic is shown to fall naturally within it. A discussion of the significance of the overview for understanding necessity and truth concludes the texts.

Wolfgang LUECK. — **Transformation groups and algebraic *K*-theory.** — Lecture notes in mathematics, vol. 1408. — Un vol. broché, 16,5 × 24, de XII, 443 p. — Prix: DM 79.00. — Springer-Verlag, Berlin, 1989.

The general pattern of the book is to assign to a geometric problem an invariant in an algebraic *K*-group which determines the problem. The algebraic *K*-theory of modules over a category is studied extensively and applied to the fundamental category of *G*-space. Basic details of the theory of transformation groups sometimes hard to find in the literature, are collected in chapter I for the benefit of graduate students.

Séminaire d'algèbre Paul Dubreil et Marie-Paule Malliavin: proceedings, Paris 1987-1988 (39ème année). — Ed.: M.-P. Malliavin. — Lecture notes in mathematics, vol. 1404. — Un vol. broché, 16,5 × 24, de IV, 410 p. — Prix: DM 69.00. — Springer-Verlag, Berlin, 1989.

14 exposés par: I. Assem et A. Skowronski, R.K. Brylinski, V. Dlab et C.M. Ringel, D. Happel, L. Le Bruyn, J.E. Bjërk, P. Carbonne, S.C. Coutinho et M.P. Holland, E.K. Ekström, T.J. Hodg˜s, T. Levasseur, Li Huishi et F. van Oystaeyen, L.H. Rowen, D. Couty.

Ernst HAIRER, Christian LUBICH, Michel ROCHE. — **The numerical solution of differential-algebraic systems by Runge-Kutta methods.** — Lecture notes in mathematics, vol. 1409. — Un vol. broché, 16,5 × 24, de VII, 139 p. — Prix: DM 25.00. — Springer-Verlag, Berlin, 1989.

The term differential-algebraic equation was coined to comprise differential equations with constraints (differential equations on manifolds) and singular implicit differential equations. Such problems arise in a variety of applications, e.g. constrained mechanical systems, fluid dynamics, chemical reaction kinetics, simulation of electrical networks, and control engineering. These lecture notes provide a self-contained and comprehensive treatment of the numerical solution of differential-algebraic systems using Runge-Kutta methods, and also extrapolation methods. The subject is treated in its various aspects ranging from the theory through the analysis to implementation and applications.

Differential geometry: proceedings of the 3rd International symposium, held in Peniscola, Spain, June 5-12, 1988. — Eds.: F.J. Carreras, O. Gil-Medrano, A.M. Naveira. — Lecture notes in mathematics, vol. 1410. — Un vol. broché, 16,5 × 24, de v, 308 p. — Prix: DM 53.00. — Springer-Verlag, Berlin, 1989.

This volume of proceedings contain selected and refereed articles — both surveys and original research articles — on geometric structures, global analysis, differential operators on manifolds, cohomology theories and other topics in differential geometry.

Topological fixed point theory and applications: proceedings of a conference held at the Nankai Institute of Mathematics, Tianjin, China, April 5-8, 1988. Ed.: Boju Jiang. — Lecture notes in mathematics, vol. 1411. — Un vol. broché, 16,5 × 24, de VI, 203 p. — Prix: DM 37.00. — Springer-Verlag, Berlin, 1989.

This selection of papers from the Beijing conference gives a cross-section of the current trends in the field of fixed point thoery as seen by topologists and analysts. Apart from one survey article, they are all original research articles, on topics including equivariant theory, extensions of Nielsen theory, periodic orbits of discrete and continuous dynamical systems, and new invariants and techniques in topological approaches to analytic problems.

Lars HOERMANDER. — **An introduction to complex analysis in several variables.** — Third revised edition. — North-Holland mathematical library, vol. 7. — Un vol. relié, 16 x 23, de XII, 254 p. — Prix: US$ 71.75/Dfl. 140.00. — North-Holland, Amsterdam, 1990.

The additions made in this third, revised edition place additional stress on results where these methods are particularly important. Thus, a section has been added presenting Ehrenpreis'

"fundamental principle" in full. The local arguments in this section are closely related to the proof of the coherence of the sheaf of germs of functions vanishing on an analytic set. Also added is a discussion of the theorem of Siu on the Lelong numbers of plurisubharminic functions. Since L^2 techniques are essential in the proof and plurisubharmonic functions play such an important role in this book, it seems natural to discuss their main singularities.

Stochastics, algebra and analysis in classical and quantum dynamics. — Proceedings of the IVth French-German encounter on mathematics and physics, CIRM, Marseille, France, February/March 1988. — Ed. by S. Albeverio, Ph. Blanchard, and D. Testard. — Mathematics and its applications, vol. 59. — Un vol. relié, 16,5 × 24,5 de xv, 246 p. — Prix: Dfl. 160.00. — Kluwer Academic Publishers, Dordrecht, 1990.

This state-of-art volume contains both survey papers and original research papers which together reflect the wide scope of the probabilistic, algebraic and analytical methods currently employed in the framework of classical and quantum dynamics. The papers included deal with various aspects of probability theory, quantum field theory, the theory of dynamical systems and cyclic homology.

Ivan H. Dimovski. — **Convolutional calculus.** — Mathematics and its Applications (East European series), vol. 43. — Un vol. relié, 16,5 × 24,5 de xi, 184 p. — Prix: Dfl. 150.00. — Kluwer Academic Publishers, Dordrecht, 1990.

This volume presents a development of a method based on the notion of the convolution of a linear operator. This unifies approaches from operational calculus, multiplier theory, algebraic analysis and spectral theory. The starting point is Mikusinski's approach to Heaviside operational calculus and this is extended to local and nonlocal boundary value problems for 1st and 2nd order linear differential operators. The basic tool employed for new developments is the transmutation method, effectively used for obtaining explicit convolutions for the Sturm-Liouville, and Hankel finite integral transforms. The most important application of the convolutional method is the extension of the Duhamel method for space-variables of problems of mathematical physics in rectangular domains.

V.M. Gol'dshtein and Yu.G. Reshetnyak. — **Quasiconformal mappings and Sobolev spaces.** — Mathematics and its applications (Soviet series), vol. 54. — Un vol. relié, 16,5 × 24,5 de xi, 184 p. — Prix: Dfl. 260.00. — Kluwer Academic Publishers, Dordrecht, 1990.

This book presents a study of the interconnection between Sobolev spaces, geometric classes of mappings (quasiconformal and quasi-isometric) and non-linear capacity. Some of the topics encountered are: foundations of the theory of classes of functions with generalized derivatives, methods of constructing special integral representations of functions, theory of nonlinear capacity (which, in certain respects, fulfils a role similar to that of measure in the Lebesgue integral), etc.

O.I. Zavialov. — **Renormalized quantum field theory.** — Mathematics and its applications (Soviet series), vol. 21. — Un vol. relié, 16,5 × 24,5 de xii, 524 p. — Prix: Dfl. 295.00. — Kluwer Academic Publishers, Dordrecht, 1990.

This book presents the main results of renormalization theory. The first part deals with renormalization on the level of individual diagrams. Criteria for infrared convergence are discussed, and different renormalization schemes are described. The second part deals with renormalization on the level of the overall matrix elements. The alternative approach to the Zimmermann normal product formalism is described here. Short-distance and light-cone

operator- product expansions are considered in detail. Renormalization of gauge theories is thoroughly discussed.

Nonlinear hyperbolic problems. — Proceedings of an Advanced Research Workshop held in Bordeaux, France, June 13-17, 1988. — Edited by C. Carasso, P. Charrier, B. Hanouzet, J.-L. Joly. — Lecture notes in mathematics, 1402. — Un vol. broché, 16,5 × 24, de v, 249 p. — Prix: DM 45.00. — Springer-Verlag, Berlin, 1989.

The papers included in this proceedings volume are mostly original research papers, dealing with life-span of waves, nonlinear interaction of waves, and various applications to fluid dynamics.

Optimization. — Proceedings of the fifth French-German Conference held in Castel-Novel (Varetz), France, Oct. 3-8, 1988. — Lecture notes in mathematics, vol. 1405. — Un vol. broché, 16,5 × 24, de VIII, 220 p. — Prix: DM 37.00. — Springer-Verlag, Berlin, 1989.

The proceedings of this Conference include papers on projective methods in linear programming, nonsmooth optimization, two-level optimization, multiobjective optimization, partial inverse method, variational convergence, Newton type algorithms and flows and on practical applications of optimization. A. Ioffe and J.-Ph. Vial have contributed survey papers on respectively second order optimality conditions and projective methods in linear programming.

Steve WRIGHT. — **Uniqueness of the injective III_1 factor.** — Lecture notes in mathematics, vol. 1413. — Un vol. broché, 16,5 × 24, de III, 108 p. — Prix: DM 25.00. — Springer-Verlag, Berlin, 1989.

These notes are a detailed exposition of recent work of A. Connes and U. Haagerup which together constitute a proof that all injective factor of type III_1 which act on a separable Hilbert space are isomorphic. This result disposes of the final open case in the classification of the separably acting injective factors, and is one of the outstanding recent achievements in the theory of operator algebras.

Algebraic geometry and complex analysis. — Proceedings of the Workshop held in Pátzcuaro, Michoacán, México, Aug. 10-14, 1987. — Edited by E. Ramirez de Arellano. — Lecture notes in mathematics, 1414. — Un vol. broché, 16,5 × 24, de VI, 180 p. — Prix: DM 30.00. — Springer-Verlag, Berlin, 1989.

From the contents: G.R. Kempf: The addition theorem for abstract Theta functions. — L. Brambila: Existence of universal extensions. — A. Del Centina, S. Recillas: On a property of the Kummer variety and a relation between two moduli spaces of curves. — C. Gomez-Mont: On closed leaves of holomorphic foliations by curves. — G.R. Kempf: Fay's trisecant formula. — D. Mond, R. Pelikaan: Fitting ideals and multiple points of analytic mappings. — P.O. Schreyer: Certain Weierstrass points occur at most once on a curve. — R. Smith, H. Tapia-Recillas: The Gauss map on subvarieties of Jacobians of curves ...

Michel EMERY. — **Stochastic calculus in manifolds. With an appendix by P.A. Meyer.** — Universitext. — Un vol. broché, 16,5 × 24, de X, 151 p. — Prix: DM 48.00. — Springer-Verlag, Berlin, 1989.

Addressed to both pure and applied probabilists, including graduate students, this text is a pedagogically-oriented introduction to the Schwartz-Meyer second-order geometry and its use in stochastic calculus. P.A. Meyer has contributed an appendix presenting the basis of stochastic calculus and thus making the book better accessible to non-probabilists also.

Ferdinand VERHULST. — **Nonlinear differential equations and dynamical systems.** — Universitext. — Un vol. broché, 16,5 × 24, de IX, 277 p. — Prix: DM 38.00. — Springer-Verlag, 1990.

This book bridges the gap between elementary courses and the research literature. — *Contents:* Autonomous equations. Critical points. Periodic solutions. Introduction to the theory of stability. Linear equations. Stability by linearisation. Stability analysis by the direct method. Introduction to perturbation theory. The Poincaré-Lindstedt method. The method of averaging. Relaxation oscillations. Bifurcation theory. Chaos. Hamiltonian systems. Appendices: The Morse lemma, linear periodic equations with a small parameter. Trigonometric formulas and averages.

Tom M. APOSTOL. — **Modular functions and Dirichlet series in number theory.** — Second edition. — Graduate texts in mathematics, vol. 41. — Un vol. relié, 16 × 24, de X, 204 p. — Prix: DM 98.00. — Springer- Verlag, New York, 1990.

This volume presupposes an undergraduate background in number theory, together with a knowledge of the basic concepts of complex analysis. Most of this book is devoted to a classical treatment of elliptic and modular functions with some of their number-theoretic applications. In addition to the correction of misprints, minor changes in the exercices and an updated bibliography, this new edition includes an alternative treatment of the transformation formula for the Dedekind eta function.

Serge LANG. — **Cyclotomic fields I and II. Combined second edition.** — With an appendix by Karl Rubin. — Graduate texts in mathematics, vol. 121. — Un vol. relié, 16 × 24, de XVII, 433 p. — Prix: DM 98.00. — Springer-Verlag, New York, 1990.

This book begins with basic material on character sums, and proceeds to treat class number formulas, p-adic L-functions, Iwasawa theory, Lubin-Tate theory, and explicit reciprocity laws, and the Ferrero-Washington theorems, which prove Iwasawa's conjecture on the growth of the p-primary part of the ideal class group.

Cinquante ans de polynômes = fifty years of polynomials. — Proceedings of a Conference held in honour of Alain Durand at the Institut Henri Poincaré, Paris, France, May 26-27, 1988. — Edited by M. Langevin, M. Waldschmidt. — Lecture notes in mathematics, vol. 1415. — Un vol. broché, 16,5 × 24, de IX, 235 p. — Prix: DM 37.00. — Springer-Verlag, Berlin, 1990.

Before his untimely death in 1986, Alain Durand had undertaken a systematic and in-depth study of the arithmetic perspectives of polynomials. Four unpublished articles of his, formed the centerpiece of attention at a colloquium in Paris in 1988 and are reproduced in this volume together with 11 other papers on closely related topics. A detailed introduction by M. Langevin sets the scene and places these articles in a unified perspective.

Géométrie symplectique et mécanique. — Colloque international, La Grande Motte, France, 23-28 mai, 1988. — Edité par C. Albert. — Lecture notes in mathematics, vol. 1416. — Un vol. broché, 16,5 × 24, de V, 289 p. — Prix: DM 45.00. — Springer-Verlag, Berlin, 1989.

Ce volume contient les actes du 5e Colloque international du Séminaire Sud Rhodanien de Géométrie (Universités d'Avignon, Lyon, Marseille, Montpellier). Se trouvent dans ce livre, 16 exposés par: M. Audin, R. Cushman et J.C. Van der Meer, P. Dazord, N. Dezolneux-Moulis, P. Donato, J.P. Françoise, E. Giroux, P.A. Horvathy, Y. Kosmann-Schwarzbach, E. Lacomba, A. Lichnerowicz, C. Moreno, M.P. Muller, C. Roger, R. Martinez et C. Simo, F.J. Turiel.

Algebraic geometry. — Proceedings of the International Conference held in L'Aquila, Italy, May 30-June 4, 1988. — Edited by A.J. Sommese, A. Biancofiore, E.L. Livorni. — Lecture notes in mathematics, vol. 1417. — Un vol. broché, 16,5 × 24, de v, 320 p. — Prix: DM 53.00. — Springer-Verlag, Berlin, 1989.

Ce volume contient 18 exposés par: L. Badescu, E. Ballico, M. Beltrametti et A.J. Sommese, A. Biancofiore, F. Catanese, H. Clemens, W. Decker/T. Peternell/J. Le Potier/M. Schneider, P. Ellia et C. Peskine, T. Fujita, K. Hulek, P. Ionescu, E.L. Livorni, C. Oliva, M. Palleschi, M. Reid, I. Reider, F. Sakai.

Edmund HLAWKA. — **Edmund Hlawka: selecta.** — Edited by Peter M. Gruber and Wolfgang M. Schmidt. — Un vol. relié, 17,5 × 25, de vi, 551 p. — Prix: DM 164.00. — Springer-Verlag, Berlin, 1990.

Edmund Hlawka is a leading number theorist whose work has had a lasting influence on modern number theory and other branches of mathematics. He has contributed to diophantine approximation, the geometry of numbers, uniform distributions, analytic number theory, discrete geometry, convexity, numerical integration, inequalities, differential equations and gas dynamics. Of particular importance are his results in the geometry of numbers (especially the Minkowski-Hlawka theorem) and uniform distribution. This selecta volume contains his most important articles, many of which had not been easily accessible.

Ya. I. BELOPOLSKAYA, Yu. L. DALECKY. — **Stochastic equations and differential geometry.** — Mathematics and its applications (Soviet series), vol. 30. — Un vol. relié, 16,5 × 25, de xv, 260 p. — Prix: Dfl. 195.00/US$99.00. — Kluwer Academic Publishers, Dordrecht, 1990.

Stochastic analysis on manifolds has developed into an important branch of mathematics which is finding many applications in theoretical physics. It concerns the study, on infinite-dimensional manifolds, of both random processes and partial differential equations. Each of these aspects is dealt with in this book. Prominent here is connection theory on bundles, which is playing an increasingly important role in modern gauge theory.

Henry ROUANET, Jean-Marc BERNARD, Brigitte LE ROUX. — **Statistique en sciences humaines: analyse inductive des données.** — Série «Sciences humaines». — Un vol. broché, 15,5 × 24, de 272 p. — Prix: FF 125.00. — Dunod, Paris, 1990.

Afin de préparer l'étudiant à devenir un utilisateur averti de la statistique, les auteurs ont adopté une démarche didactique progressive et résolument tournée vers l'analyse des données, qui présente: les préalables techniques et conceptuels; l'inférence ensembliste, prolongement naturel de la statistique descriptive: tests de typicalité, homogénéité et indépendance; l'inférence probabiliste traditionnelle; l'initiation à l'inférence bayésienne.

Uwe JANNSEN. — **Mixed motives and algebraic K-theory.** — Lecture notes in mathematics, vol. 1400. — Un vol. broché, 16,5 × 24, de xiii, 246 p. — Prix: DM 45.00. — Springer-Verlag, Berlin, 1990.

The relations that could or should exist between algebraic cycles, algebraic K-theory, and the cohomology of — possibly singular — varieties, are the topic of investigation of this book. The author proceeds in an axiomatic way, combining the concepts of twisted Poincaré duality theories, weights and tensor categories.

Homotopy theory and related topics. — Proceedings of the International Conference held at Kinosaki, Japan, August 19-24, 1988. — Edited by M. Mimura. — Lecture notes in

mathematics, vol. 1418. — Un vol. broché, 16,5 × 24, de v, 241 p. — Prix: DM 37.00. — Springer-Verlag, Berlin, 1990.

From the contents: — I.M. James: Continuous functions of several variables. — J.R. Hubbuck: Some stably indecomposable loop spaces. — F. Cohen: A note concerning the v-periodic homotopy of odd spheres. — S.B. Priddy: On characterizing summands in the classifying space of a Lie group II. — J.F. Adams: Talk on Toda's work. — J. Morava: On the complex cobordism ring as a Fock representation. — H. Miller: On Jones's Kahn-Priddy theorem.

New integrals. — Proceedings of the Henstock Conference held in Coleraine, Northern Ireland, August 9-12, 1988. — Edited by P.S. Bullen, P.Y. Lee, J.L. Mawhin, P. Muldowney, W.F. Pfeffer. — Lecture notes in mathematics, vol. 1419. — Un vol. broché, 16,5 × 24, de v, 202 p. — Prix: DM 37.00. — Springer-Verlag, Berlin, 1990.

From the contents: — R. Henstock: Introduction to the new integrals. — P.S. Bullen: Some applications of a theorem of Markiewicz. — R. Henstock: Integration in infinite-dimensional spaces. — J. Kurzweil, J. Jarnik: The *PU*-integral, its definition and some basic properties. — P. Muldowney: Infinite-dimensional generalised Riemann Integrals. — W.F. Pfeffer: Divergence theorem for vector fields with singularities. — V.A. Skortsov: Some properties of dyadic primitives.

Mitsuo SUGIURA. — **Unitary representations and harmonic analysis: an introduction.** — Second edition. — North-Holland mathematical library, vol. 44. — Un vol. relié, 16 × 23,5, de xv, 452 p. — Prix: US$ 112.75/Dfl. 220.00. — North-Holland, Amsterdam, et Kodansha, Tokyo, 1990.

The principal aim of this book is to give an introduction to harmonic analysis and the theory of unitary representations of Lie groups. The second edition has been brought up to date with a number of textual changes in each of the five chapters, a new appendix on Fatou's theorem has been added in connection with the limits of discrete series, and the bibliography has been tripled in length.

Gregory KARPILOVSKY. — **Induced modules over group algebras.** — North-Holland mathematics studies, vol. 161. — Un vol. relié, 17 × 24,5, de xi, 520 p. — Prix: US$ 120.50/ Dfl. 235.00. — North-Holland, Amsterdam, 1990.

After establishing algebraic preliminaries, the general facts about induced modules are provided, as well as some of their formal properties, annihilators and applications. The remaining chapters include detailed information on the process of induction from normal subgroups, projective summands of induced modules, some basic results of the Green theory with refinements and extensions, simple induction and restriction pairs and permutation modules. The final chapter is based exclusively on the work of Weiss, presenting a number of applications to the isomorphism problem for group rings.

Helmut GOLDMANN. — **Uniform Fréchet algebras.** — North-Holland mathematics studies, vol. 162. — Un vol. relié, 17 × 24,5, de viii, 355 p. — Prix: US$ 102.50/Dfl. 200.00. — North-Holland, Amsterdam, 1990.

The first part of this monograph is an elementary introduction to the theory of Fréchet algebras. The problem of finding analytic structure in the spectrum of a Fréchet algebra is the

subject of the second part of the book. In particular, the author pays attention to function algebraic characterizations of certain Stein algebras (= algebras of holomorphic functions of Stein spaces) within the class of Fréchet algebras.

Harold M. EDWARDS. — **Divisor theory.** — Un vol. relié, 15,5 × 23,5, de xiv, 166 p. — Prix: Sfr. 58.00. — Birkhäuser, Boston, 1990.

This book gives a full development of a general theory of divisors (including some topics not treated by Kronecker, such as ramification and the different divisors), together with applications to algebraic number theory and to the theory of algebraic curves. An appendix on differentials makes possible the statement and proof of the Riemann-Roch theorem for curves.

Seminar on stochastic processes, 1989. — E. Çinlar, K.L. Chung, R.K. Getoor, editors. — Progress in probability, vol. 18. — Un vol. relié, 15,5 × 23,5, de 214 p. — Prix: Sfr. 68.00. — Birkhäuser, Boston, 1990.

This is the ninth volume in a series reporting on recent progress in stochastic processes. Some of the topics touched on are: The Blumenthal- Getoor-McKean theorem, the boundary Harnack principle, local times for Lévy processes, the vacancy of a Boolean coverage process, martingale problems associated with the Boltzmann equation, probabilistic methods in differential geometry and for the Schrödinger equation. The high contact principle in optimal control and stochastic waves.

Stephen BARNETT. — **Matrices: methods and applications.** — Oxford applied mathematics and computing science series. — Un vol. broché, 14 × 21,5, de xvi, 450 p. — Prix: £ 17.50 (relié: 40.00). — Clarendon Press, Oxford, 1990.

Techniques of matrix theory find wide application throughout engineering and the physical, life, and social sciences. Consequently, matrix methods comprise an important component in any "tool kit" of applied mathematics. This wide-ranging textbook provides a clearly written and up-to-date account of these methods suitable for both undergraduates and more advanced students. The range of topics covered is large: from basic matrix algebra to advanced concepts such as generalized inverses and Hadamard matrices, and applications to error-correcting codes, control theory, and linear programming.

Computation of curves and surfaces. — Edited by Wolfgang Dahmen, Mariano Gasca and Charles A. Micchelli. — NATO ASI series. Ser. C: mathematical and physical sciences, vol. 307. — Un vol. relié, 16,5 × 24,5, de ix, 536 p. — Prix: Dfl. 265.00/US$ 149.00. — Kluwer Academic Publishers, Dordrecht, 1990.

Computing and manipulating with curves and surfaces has become an increasingly important issues in various areas of applied mathematics and technology. New perspectives and problems arise that do not typically find satisfactory answers in traditional mathematical subjects. Rather an interplay of techniques and concepts from various disciplines such as approximation theory, numerical analysis, computer graphics, differential and algebraic geometry is essential. Bringing these fields closer together is necessary. This was a major objective of this conference.