# BULLETIN BIBLIOGRAPHIQUE

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Gert K. PEDERSEN. — **Analysis now.** — Graduate texts in mathematics, vol. 118. — Un vol. relié, 16 × 25, de XIV, 277 p. — Prix: DM 98.00. — Springer-Verlag, New York, 1989.

This monograph represents a serious attempt to cover, in a single volume, a number of disciplines in modern analysis that are too often treated far apart. Starting with general topology, it moves on to normed and semi-normed linear spaces, and then gives a spirited introduction to the general theory of operators on Hilbert space. After that, follow various forms the spectral theorem may take, from Gelfand theory, via spectral measures, to maximal commutative von Neumann algebras. The book concludes with two supplementary chapters, one a concise account of unbounded operators and their spectral theory, the other a complete course in measure and integrating theory from an advanced point of view.

Pierre SAMUEL. — **Projective geometry.** — Translated from *Géométrie projective*, by Silvio Levy. — Undergraduate texts in mathematics. — Readings in mathematics. — Un vol. broché, 15,5 × 23,5, de X, 156 p. — Prix: DM 68.00. — Springer-Verlag, New York, 1988.

The purpose of this book is to revive some of the beautiful results obtained by various geometers of the 19th century, and to give its readers a taste of concrete algebraic geometry. A good deal of space is devoted to cross-ratios, conics, quadrics, and various interesting curves and surfaces.

M.A. ARMSTRONG. — **Groups and symmetry.** — Undergraduate texts in mathematics. — Un vol. relié, 16 × 24, de XI, 186 p. — Prix: DM 64.00. — Springer-Verlag, New York, 1988.

Groups are important because they measure symmetry. This text provides a gentle introduction to the vocabulary and many of the highlights of elementary group theory. Written in an informal style, the material is divided into short sections. Throughout the book, emphasis is placed on concrete examples, often geometrical in nature. A novel feature at this level is a proof of the Nielsen-Schreier theorem using group actions on trees. There are more than 300 exercises.

K. KRICKEBERG, H. ZIEZOLD. — **Stochastische Methoden.** — 3. korrigierte Auflage. — Hochschultext. — Un vol. broché, 16,5 × 24, de X, 201 p. — Prix: DM 48.00. — Springer-Verlag, Berlin, 1988.

Diskrete Wahrscheinlichkeitsräume. — Drei Grundverfahren der mathematischen Statistik. — Bedingte Wahrscheinlichkeit, Unabhängigkeit. — Momente. — Statistische Inferenz über unbekannte Wahrscheinlichkeiten. — Grenzwertsätze. — Allgemeine Wahrscheinlichkeitstheorie. — Statistik normalverteilter zufälliger Variabler. — Regressions- und Varianzanalyse.

**The advances of applied mathematics and mechanics in China, vol. 1.** — Edited by Chien Weizang, Fu Zizhi. — Un vol. relié, 19,5 x 26,5, de VI, 332 p. — Prix: DM 45.00. — China Academic Publishers, Beijing. — Sole distribution rights throughout the world, excluding the People's Republic of China, granted to Springer-Verlag, Berlin, 1987.

Applied mathematics and mechanics have been widely developed in China during the past twenty years. Especially in the development of generalized variational principles, finite deformation, singular perturbation theory, nonhomogeous elasticity, Chinese scientists have made a great impact by evolving new methods and concepts. This survey of the present situation in the area of science is a remarkable contribution to the academic exchange between China and other countries. It contains articles of the leading Chinese scientists in their respective fields.

Maurice MIGNOTTE. — **Mathématiques pour le calcul formel.** — Collection «Mathématiques». — Un vol. broché, 15 × 22, de 346 p. — Prix: FF 165.00. — Presses universitaires de France, Paris, 1989.

Les ordinateurs réalisent maintenant la plupart des calculs algébriques ou analytiques exigés par les exercices de mathématiques des lycées. Cet ouvrage présente les outils mathématiques utilisés dans les programmes qui effectuent ces calculs. Le but principal poursuivi est la factorisation des polynômes. La première partie traite de l'arithmétique élémentaire et contient des résultats qui sont aussi utiles en cryptographie.

Jean Pierre SERRE. — **Lectures on the Mordell-Weil theorem.** — Translated and edited by Martin Brown from notes by Michel Waldschmidt. — Aspects of mathematics, vol. E 15. — Un vol. broché, 16,2 × 22,9, de X, 220 p. — Prix: DM 52.00. — Friedr. Vieweg & Sohn, Braunschweig, 1989.

The book is based on a course given by J.-P. Serre at the Collège de France in 1980 and 1981. Basic techniques in Diophantine geometry are covered, such as heights, the Mordell-Weil theorem, Siegel's and Baker's theorem, Hilbert's irreducibility theorem, and the large sieve. Included are applications to, for example, Mordell's conjecture, the construction of Galois extensions, and the classical class number 1 problem.

Donald S. PASSMAN. — **Infinite crossed products.** — Pure and applied mathematics, vol. 135. — Un vol. relié, 16 × 23,5, de XII, 468 p. — Prix: £34.50. — Academic Press, London, 1989.

Crossed products are another meeting place for group theory and ring theory. Recently they have become related to the study of infinite group algebras, group-graded rings and the Galois theory of noncommutative rings. This book is mainly concerned with these newer developments. The following topics form the core of the book: Cohen-Montgomery duality; understanding and computing the symmetric Martindale ring of quotients of prime and semiprime rings; classifying prime and semiprime crossed products; the Galois theory of prime and semiprime rings, along with skew group ring applications to the subject; determining the Grothendieck group of a Noetherian crossed product to settle the zero divisor and Goldie rank conjectures.

Vladimir ARNOLD. — **Contact geometry and wave propagation.** — Monographie de l'Enseignement Mathématique N° 34, Série des conférences de l'Union Mathématique Internationale N° 9. — Un vol. broché, 16 × 24, de 56 p. — Prix: SFr. 27.00. — L'Enseignement Mathématique, Université de Genève, 1989.

These survey lectures were given at the University of Oxford, under the sponsorship of the International Mathematical Union. Contact geometry, which is the odd-dimensional counter-

part of the symplectic one, is the natural basis for optics and for the theory of wave propagation. *Contents:* Basic definitions. — Characteristics. — Submanifolds. — Legendre fibrations and singularities. — Legendre varieties and the obstacle problem.

**Orthogonal polynomials and their applications: proceedings of the International Congress.** — Ed. by Jaime Vinuesa. — Lecture notes in pure and applied mechanics, vol. 117. — Un vol. broché, 17,5 × 25,7 de x, 207 p. — Prix: US$99.75 (US et Canada)/US$119.50 (autres pays). — Marcel Dekker, New York, 1989.

This work includes 17 original research and survey papers on the theory of orthogonal polynomials presented at the International Congress on Orthogonal Polynomials held in Laredo, Spain. This congress announced results of recent mathematical advances in areas such as Fourier analysis, approximation theory, differential equations, Toeplitz matrices and numerical analysis. It includes recent breakthroughs in applications to birth-death processes, integral transforms, best Padé approximations, etc.

I.M. JAMES. — **Fibrewise topology.** — Cambridge tracts in mathematics, vol. 91. — Un vol. relié, 15,5 × 23,5 de x, 198 p. — Prix: £27.50/US$49.50. — Cambridge University Press, 1989.

The aim of this book is to promote the fibrewise viewpoint, particularly in topology, which is central to modern mathematics. This perspective is standard in the theory of fibre bundles and hence in subjects such as global analysis. It also has an important role to play in homotopy theory and, as has only recently been recognized, in general topology. There are strong links with equivariant topology, a topic which has latterly been subject to great research activity.

Serge LANG. — **Introduction to Arakelov theory.** — Un vol. relié, 16 × 24 de x, 187 p. — Prix: DM 98.00. — Springer-Verlag, New York, 1988.

Arakelov introduced a component at infinity in arithmetic considerations, thus giving rise to global theorems similar to those of the theory of surfaces, but in an arithmetic context over the ring of integers of a number field. The book gives an introduction to this theory, including the analogues of the Hodge Index Theorem, the Arakelov adjunction formula, and the Faltings Riemann-Roch theorem.

Nicolas BOURBAKI. — **Elements of mathematics: general topology, chapters 1-4.** — Un vol. relié, 16 × 23,5 de VII, 437 p. — Prix: DM 108.00. — Springer-Verlag, Berlin, 1989.

This book is a reprint of the 1966 edition. Starting from the definitions, it gives a thorough treatment of the basic (and often non-trivial) aspects of general topology. The different topics treated are: General topological notions (including filters), Hausdorff, regular, compact, locally compact spaces — Uniform structures, complete spaces and the relationship between compactness and completeness — Topological groups — Construction and study of the fields of real numbers.

Nicolas BOURBAKI. — **Elements of mathematics: general topology, chapters 5-10.** — Un vol. relié, 16 × 23,5 de IV, 363 p. — Prix: DM 98.00. — Springer-Verlag, Berlin, 1988.

This book, a reprint of the 1966 edition, completes the treatment of general topology begun in chapters 1-4. The first chapters study subgroups and quotients of $R$ (with applications to the "measurement of magnitudes" and to the log and exp functions), then real vector spaces and projective spaces, then the additive groups $R^n$. The final chapter deals with the various topologies of function spaces, ending with a section on approximation of functions.

Nicolas BOURBAKI. — **Elements of mathematics: algebra, chapters 1-3.** — Un vol. relié, 16 × 23,5 de XXIII, 709 p. — Prix: DM 108.00. — Springer-Verlag, Berlin, 1989.

This is a new printing of the 1974 edition originally published by Addison- Wesley. It gives a thorough treatment of the fundamentals of general, linear and multilinear algebra. The topics treated are: Basic algebraic structures (composition laws, groups — esp. the Jordan-Hölder theorem — group actions, solvable and nilpotent groups with the Sylow theorems, free groups, rings and fields); linear algebra viz. modules over a general base ring; algebras, coalgebras and bialgebras (Hopf algebras).

Komaravolu CHANDRASEKHARAN. — **Classical Fourier transforms.** — Universitext. — Un vol. broché, 16,5 × 24 de VII, 172 p. — Prix: DM 38.00. — Springer-Verlag, Berlin, 1989.

This book gives a thorough introduction on classical Fourier transforms in a compact and self-contained form. Chapter 1 is devoted to the $L^1$-theory: basic properties are proved as well as the Poisson summation formula, the central limit theorem and Wiener's general tauberian theorem. Chapter 2 is devoted to the $L^2$-theory, including Plancherel's theorem, Heisenberg's inequality, the Paley-Wiener theorem, Hardy's interpolation formula and two inequalities due to Bernstein. Chapter 3 deals with Fourier-Stieltjes transforms.

**Progress in mathematical programming : interior-point and related methods.** — Ed. by Nimrod Megiddo. — Un vol. relié, 16 × 24 de X, 158 p. — Prix: DM 78.00. — Springer-Verlag, New York, 1989.

The starting point of this volume was a conference entitled "Progress in Mathematical Programming", held at the Asilomar Conference Center in Pacific Grove, California, March 1-4, 1987. The main topic of the conference was developments in the theory and practice of linear programming since Karmarka's algorithm. Presentations included new algorithms, new analysis of algorithms, reports on computational experience, and some other topics related to the practice of mathematical programming.

**The evolving role of statistical assessments as evidence in the courts.** — Ed. by Stephen E. Fienberg. — Un vol. relié, 16 × 24,5 de XVII, 357 p. — Prix: DM 68.00. — Springer-Verlag, New York, 1989.

In this report, a variety of issues are addressed that arise in federal and state court proceedings when statistical assessments are presented as evidence (quantitative descriptions, causal inferences, and predictions of events based on earlier occurrences). Recommendations include several innovations to improve the comprehension of statistical evidence by judges and juries. In addition to jurists, this report is addressed also to lawyers, statisticians, social scientists and others who may serve as expert witnesses presenting statistical arguments.

**Extreme value theory : proceedings of a conference held in Oberwolfach, Dec. 6-12, 1987.** — Ed. by J. Hüsler, R.-D. Reiss. — Lecture notes in statistics, vol. 51. — Un vol. broché, 16,5 × 24 de X, 279 p. — Prix: DM 52.00. — Springer-Verlag, New York, 1989.

The purpose of this book is to lay out in an expository way the broad spectrum of extremes by contributions, some of which review recent developments and some which include original ideas and results. The book is split into 3 parts with a total number of 9 sections. The topics include probabilistic theory, statistical theory of extreme values, and multivariate extremes and records.

N. BOURBAKI. — **Elements of mathematics: Lie groups and Lie algebras, chapters 1-3.** — 2nd printing of the 1st ed. — Un vol. relié, 16 × 23,5, de XVII, 462 p. — Prix: DM 98.00. — Springer-Verlag, Berlin, 1989.

The 1st chapter of the book describes the theory of Lie algebras, their derivations, their representations and their enveloping algebras. In the 2nd chapter, free Lie algebras are introduced in order to discuss the exponential, the logarithmic and the Hausdorff series. The 3rd chapter treats the theory of Lie groups of *R, C,* and utrametric fields. It decribes the connections between their local and their global properties, and the properties of their Lie algebras.

N. BOURBAKI. — **Elements of mathematics: commutative algebra, chapters 1-7.** — 2nd printing of the 1st ed. — Un vol. relié, 16 × 23,5, de XXIV, 625 p. — Prix: DM 108.00. — Springer-Verlag, Berlin, 1989.

This book gives a rather complete treatment of commutative algebra, enabling one to go further and study algebraic or arithmetical geometry. The main topics treated are: the notions of flatness, localization and completions, associated prime ideals and the primary decomposition, integers, integral closures and finitely generated algebras over a field, valuation of any rank, and divisors, with a final section on modules over integrally closed Noetherian domains. A historical note is appended, and useful exercises are gathered at the end of chapters.

Jean MAWHIN, Michel WILLEM. — **Critical point theory and Hamiltonian systems.** — Applied mathematical sciences, vol. 74. — Un vol. relié, 16 × 24, de XIV, 277 p. — Prix: DM 108.00. — Springer-Verlag, New York, 1989.

The direct method of the calculus of variations. — The Fenchel transform and duality. — Minimization of the dual action. — Minimax theorems for indefinite functionals. — A Borsuk-Ulam theorem and index theories. — Lusternik-Schnirelman theory and multiple periodic solutions with fixed energy. — Morse-Ekeland index and multiple periodic solutions with fixed period. — Morse theory. — Applications of Morse theory to second order systems. — Nondegenerate critical manifolds.

T. CACOULLOS. — **Exercises in probability. — Problem books in mathematics.** — Un vol. relié, 16 × 24, de IX, 248 p. — Prix: DM 98.00. — Springer-Verlag, New York, 1989.

This book can serve as a companion text for an introductory or intermediate level probability course. Those will benefit most who have a good grasp of calculus. Many others with less formal mathematical background can also benefit from the large variety of solved problems ranging from classical combinatorial problems to limit theorems and the law of iterated logarithms. It contains 329 problems with solutions as well as an addendum of over 160 exercises and certain complements of theory and problems.

Prem K. GOEL, T. RAMALINGAM. — **The matching methodology: some statistical properties.** — Lecture notes in statistics, vol. 52. — Un vol. broché, 16,5 × 24,5, de VIII, 152 p. — Prix: DM 36.00. — Springer-Verlag, New York, 1989.

This book presents a review of the literature and statistical properties of matching procedures. It is intended for statisticians and researchers interested in social statistics and incomplete data problems. The authors point out unsolved problems and new results on statistical properties of matching procedures.

Heinrich RENELT. — **Elliptic systems and quasiconformal mappings.** — Pure and applied mathematics. — Un vol. relié, 16 × 23,5, de VII, 146 p. — Prix: £14.95. — John Wiley, Chichester, 1988.

Auxiliary results from analysis. — Quasiconformal mappings and solutions of Beltrami systems. — Elliptic systems of partial differential equations of first order in the plane. — Some function theoretic properties of (ν, μ)- solutions. — Integral transformations and fundamental solutions. — Integral formulae for (ν, μ)-solutions. — Variational methods for schlicht (ν, μ)-solutions.

**Applications and modelling in learning and teaching mathematics.** — Edited by W. Blum ... *et al.* — Ellis Horwood series in mathematics and its applications. — Un vol. relié, 17 × 24,5, de XVI, 451 p. — Prix: £59.50. — E. Horwood, Chichester, Halsted Press, a division of John Wiley & Sons, New York, 1989.

This book presents the appropriate recent research and development studies in the teaching and learning of mathematics in connection with real-life situations: theoretical concepts, empirical research, concrete applications, and classroom examples for all levels from lower secondary up to university. It provides an international forum for the discussion and exchange of experiences with applications and modelling, considering in particular the social and technological developments and changes with respect to mathematics teaching.

Seth WARNER. — **Topological fields. North-Holland mathematics studies, vol. 157.** — Notas de matématica, vol. 126. — Un vol. relié, 17 × 24,5, de XIII, 563 p. — Prix: £110.50/ Dfl. 210.00. — North-Holland, Amsterdam, 1989.

Aimed at those acquainted with basic point-set topology and algebra, this text goes up to the frontiers of current research in topological fields (more precisely, topological rings that algebraically are fields.) The reader is given enough background to tackle the current literature without undue additional preparation. Many results not in the text (and many illustrations by example of theorems in the text) are included among the exercises. Sufficient hints for the solution of the exercises are offered so that solving them does not become a major research effort for the reader. A comprehensive bibliography completes the volume.

Alexander D. BRUNO. — **Local methods in nonlinear differential equations.** — Supplemented version of the original Russian edition. — Translated from the Russian by William Hovingh and Courtney S. Coleman. — Un vol. relié, 16 × 23,5, de X, 348 p. — Prix: DM 188.00. Springer-Verlag, Berlin, 1989.

*The local method of nonlinear analysis of differential equations: Foundations of the local method.* — A system of two differential equations. — The normal form of a system on *n* differential equations. — On the Newton polyhedron. — Applications of the normal form in mechanics. — *The sets of analyticity of a normalizing transformation: The seminormal form.* — Questions of convergence. — A Hamiltonian system. — Families of periodic solutions. — Integral manifolds with small divisors.

Reinhold HUEBL. — **Traces of differential forms and Hochschild homology.** — Lecture notes in mathematics, vol. 1368. — Un vol. broché, 16,5 × 24, de III, 111 p. — Prix: DM 25.00. — Springer-Verlag, Berlin, 1989.

This monograph provides an introduction to, as well as a unification and extension of the published work and some unpublished ideas of J. Lipman and E. Kunz about traces of differen-

tial forms and their relations to duality theory for projective morphisms. The approach uses Hochschild-homology, the definition of which is extended to the category of topological algebras.

**Differential geometry and topology: proceedings of the Special Year at Nankai Institute of Mathematics, Tianjin, PR China, 1986-87.** — Eds.: B. Jiang, C.-K. Peng, Z. Hou. — Lecture notes in mathematics, vol. 1369. — Un vol. broché, 16,5 × 24, de VI, 366 p. — Prix: DM 61.00. — Springer-Verlag, Berlin, 1989.

T.E. Cecil, S.S. Chern: Dupin submanifolds in Lie sphere geometry. — R.L. Cohen, U. Tillmann: Lectures on immersion theory. — A.-M. Li: Affine maximal surface and harmonic functions. — S. Murakami: Exceptional simple Lie groups and related topics in recent differential geometry. — U. Simon: Dirichlet problems and the Laplacian in affine hypersurface theory. — S. Wang: Essential invariant circles of surface automorphism of finite order. 18 autres articles.

Jorge ANGELES. — **Rational kinematics.** — Springer tracts in natural philosophy, vol. 34. — Un vol. relié, 16 × 24, de XII, 121 p. — Prix: DM 78.00. — Springer-Verlag, New York, 1988.

The purpose of this book is to present kinematics of rigid bodies and systems in an axiomatic framework, stressing invariant relations. The audience addressed is engineers, mathematicians, and computer scientists working in research and development that involves rigid-body motions. The areas of applications are robotics, mechanism design, spacecraft dynamics, computer graphics, solid modelling, finite elements, etc.

Adriaan C. ZAANEN. — **Continuity, integration and Fourier theory.** — Universitext. — Un vol. broché, 16,5 × 24, de VIII, 251 p. — Prix: DM 48.00. — Springer-Verlag, Berlin, 1989.

The first part of this textbook is devoted to continuity properties, culminating in the theorems of Korovikin and Stone-Weierstrass. The last part consists of extensions and applications of the Fourier theory, for example the Wilbraham-Gibbs phenomenon, the Hausdorff-Young theorem, the Poisson sum formula and the heat and wave equations.

M.A. KRASNOSEL'SKII, A.V. POKROVSKII. — **Systems with hysteresis.** — Translated from the Russian by Marek Niezgodka. — Un vol. relié, 17 × 24, de XVIII, 410 p. — Prix: DM 148.00. — Springer-Verlag, Berlin, 1989.

Hysteresis phenomena are common in numerous physical, mechanical, ecological and biological systems. They reflect memory effects and process irreversibility. The use of hysteresis operators (hysterons) offers an approach to macroscopic modelling of the dynamics of phase transitions and rheological systems. The applications cover processes in electromagnetism, elastoplasticity and population dynamics in particular.

**Encyclopaedia of mathematical sciences, vol. 9: Several complex variables III. Geometric function theory.** — Ed.: G.M. Khenkin. — Un vol. relié, 16 × 24, de VII, 261 p. — Prix: DM 128.00. — Springer-Verlag, Berlin, 1989.

*Contents:* Entire functions. Multidimensional value distribution theory. Invariant metrics. Finiteness theorems for holomorphic maps. Holomorphic maps $C^n$ and the problem of holomorphic equivalence. The geometry of *CR*-manifolds. Supersymmetry and complex geometry.

**Algebraic topology.** — Proceedings of an International Conference held in Arcata, California, July 27-August 2, 1986. — Edited by G. Carlsson, R.L. Cohen, H.R. Miller, D.C. Ravenel. — Lecture notes in mathematics, vol. 1370. — Un vol. broché, 16,5 × 24, de IX, 456 p. — Prix: DM 79.00. — Springer-Verlag, Berlin, 1989.

The conference preceded ICM 86 in Berkeley, and was conceived as a successor to the Aarhus conferences of 1978 and 1982. Some thirty papers are included in this volume, mostly at a research level. Subjects include cyclic homology, $H$-spaces, transformation groups, real and rational homotopy theory, acyclic manifolds, the homotopy theory of classifying spaces, instantons and loop spaces, and complex bordism.

Sarah GLAZ. — **Commutative coherent rings. Lecture notes in mathematics, vol. 1371.** — Un vol. broché, 16,5 × 24, de XI, 347 p. — Prix: DM 61.00. — Springer-Verlag, Berlin, 1989.

This book provides the first extensive and systematic treatment of the theory of commutative coherent rings. It blends, and provides a link, between the two sometimes disjoint approaches available in the litterature, the ring theoretic approach, and the homological algebra approach. The book covers most results in commutative coherent ring theory known to date, as well as a number of results never published before.

**Lie algebras, Madison 1987.** — Proceedings of a workshop held in Madison, Wisconsin, August 23-28, 1987. — Edited by Georgia Benkart, J. Marshall Osborn. — Lecture notes in mathematics, vol. 1373. — Un vol. broché, 16,5 × 24, de V, 145 p. — Prix: DM 30.00. — Springer-Verlag, Berlin, 1989.

The principal focus of the Special Year of Lie algebras 1987-1988, and of this workshop in Madison, Wisconsin was the long-standing problem of classifying the simple finite-dimensional Lie algebras over algebraically closed field of prime characteristic. However, other lectures at the workshop dealt with the related areas of algebraic groups, representation theory, and Kac-Moody Lie algebras.

Robion C. KIRBY. — **The topology of 4-manifolds.** — Lecture notes in mathematics, vol. 1374. — Un vol. broché, 16,5 × 24, de VI, 108 p. — Prix: DM 25.00. — Springer-Verlag, Berlin, 1989.

This book presents the classical theorems about simply connected smooth 4- manifolds: intersection forms and homotopy type, oriented and spin bordism, the index theorem, Wall's diffeomorphisms and h-cobordism, and Rohlin's theorem. Most of the proofs are new or are refurbishings of past proofs; all are geometric. There is a new proof of Rohlin's theorem using spin structures. The reader needs an understanding of smooth manifolds and characteristic classes in low dimensions.

**Transformation groups.** — Proceedings of a conference held in Osaka, Japan, Dec. 16-21, 1987. — Edited by K. Kawakubo. — Lecture notes in mathematics, vol. 1375. — Un vol. broché, 16,5 × 24, de VIII, 394 p. — Prix: DM 61.00. — Springer-Verlag, Berlin, 1989.

The aim of this conference was to reflect recent advances in the theory of transformation groups and to stimulate discussions for new directions and for future research. There were a total of 136 participants. This volume contains 32 papers by W.C. Hsiang, T. Asoh, A.H. Assadi, T. tom Dieck, T. Petrie, K.H. Dovermann, M. Rothenberg, A. Hattori, S. Illman, T. Inoue, M. Kamata, Y. Kamishima, T. Kanenobu, M. Kato, K. Kawakubo, K. Komiya, H.T. Ku, M.C. Ku, K.B. Lee, F. Raymond, I. Madsen, M. Masuda, M. Morimoto, I. Nagasaki, E. Ossa,

K. Pawalowski, M. Sakuma, R. Schultz, P. Strantzalos, C.B. Thomas, F. Ushitaki, S.H. Weintraub, C.m. Wu, A. Yamakawa.

Branko GRUENBAUM, G.C. SHEPHARD. — **Tilings and patterns: an introduction.** — Un vol. broché, 20 × 23, de IX, 446 p. — Prix: $18.95. — W.H. Freeman, New York, 1989.

The art of tiling a plane surface has intrigued artisans, gamesters, and geometers for thousands of years. Yet the science of tilings and tile-based patterns did not receive a firm foundation until the publication of Grünbaum and Shephard's "Tilings and Patterns" in 1987. That book was acclaimed as the first systematic treatment of the subject. "Tilings and patterns: an introduction" presents in convenient paperback form the first half — the most essential chapters — of "Tilings and patterns". Omitting the more specialized material of the earlier volume, this abbreviated, moderately priced edition makes the authors' contributions to tiling theory and its practical applications fully accessible to a wide audience.

Atle SELBERG. — **Collected papers, vol. 1.** — Un vol. relié, 17 × 25, de VI, 711 p. — Prix: DM 228.00. — Springer-Verlag, Berlin, 1989.

From the foreword by K. Chandrasekharan: "The early work of Atle Selberg lies in the fields of analysis and number theory. It concerns the Riemann zeta- function, Dirichlet's L-functions, the Fourier coefficients of modular forms, the distribution of prime numbers, and the general sieve method. It is brilliant, and unsurpassed, and in the finest classical tradition. His later work cuts across many fields: function theory, operator theory, spectral theory, group theory, topology, differential geometry, and number theory. It has enlarged and transfigured the whole concept and structure of arithmetic ..."

Werner FENCHEL. — **Elementary geometry in hyperbolic space.** — De Gruyter studies in mathematics, vol. 11. — Un vol. relié, 18 × 24,5, de XI, 225 p. — Prix: DM 128.00. — Walter de Gruyter, Berlin, 1989.

*From the preface:* "There exist many excellent books on non-Euclidean geometry. To add another one is motivated by the fact that these books contain very little about the geometry in hyperbolic space which has found various applications... In the following presentation of various aspects of the elementary geometry in hyperbolic space the axiomatic point of view has been completely neglected. Everything is based on the conformal model." *Contents:* Preliminaries. The Möbius group. The basic notions of hyperbolic geometry. The isometry group of hyperbolic space. Right-angled hexagons. Points and planes. Spherical surfaces. Area and volume.

Eva LOWEN-COLEBUNDERS. — **Function classes of Cauchy continuous maps.** — Pure and applied mathematics, vol. 123. — Un vol. relié, 16 × 23,5, de XIV, 166 p. — Prix: $89.75 (USA et Canada), $107.50 (autres pays). — Marcel Dekker, New York, 1989.

This book unites the theory of extensions and function classes with the theory of Cauchy spaces, completions, and Cauchy continuous maps... compares the function classes of continuous maps with the well-known function classes of continuous maps, and surveys the essential part of the theory of Cauchy spaces related to extensions in a logically coherent manner. Cauchy spaces are explained with respect to the categories of nearness and merotopic spaces. This work adds schemes to elucidate the relations between the various categories.

R.-D. REISS. — **Approximate distributions of order statistics : with applications to nonparametric statistics.** — Springer series in statistics. — Un vol. relié, 16 × 24, de XII, 355 p. — Prix: DM 124.00. — Springer-Verlag, New York, 1989.

This book is designed as a unified and mathematically rigorous treatment of some recent developments of the asymptotic distribution theory of order statistics, including the extreme order statistics. Particular emphasis is placed on results concerning the accuracy of limit theorems, on higher order approximations and other approximations in quite a general sense. The main results will be formulated in terms of the variational and the Hellinger distance.

Wolfgang TUTSCHKE. — **Solution of initial value problems in classes of generalized analytic functions.** — Un vol. broché, 13,5 × 20,5, de 188 p. — Prix: DM 54.00. — Springer-Verlag, Berlin, 1989.

The main subject of this book is the generalization of the Cauchy-Kovalevska theorem. Solutions of initial value problems are given for the cases where the initial functions are generalized analytic functions (instead of classical holomorphic functions). Two functional-analytic methods are employed: the method of Banach space scales and a modification of W. Walters's elementary proof of the classical theorem by Cauchy-Kovalevska using weighted values.

Hüseyin KOCAK. — **Differential and difference equations through computer experiments: with diskettes containing PHASER: an animator/simulator for dynamical systems for IBM personal computers.** — Second edition. — Un vol. broché, 15,5 × 23,5, de XVII, 224 p. — Prix: DM 144.00. — Springer- Verlag, New York, 1989.

PHASER is a sophisticated program developed at Brown University which enables users to experiment with differential and difference equations and dynamical systems in an interactive environment using graphics. This book begins with a brief discussion of the geometric interpretation of differential equations and numerical methods, and proceeds to guide the student through the use of the program. To run PHASER, you need an IBM PC, XT, AT, or PS/2 with an IBM Color Graphics Board, Enhanced Graphics Adapter (EGA), or Video Graphics Adapter (VGA). A math coprocessor is supported; however, it is not required to run PHASER with the hardware above.

G. CAPRIZ. — **Continua with microstructure.** — Springer tracts in natural philosophy, vol. 35. — Un vol. relié, 15,5 × 24, de X, 92 p. — Prix: DM 90.00. — Springer-Verlag, New York, 1989.

The book offers a new general setting for theories of bodies with microstructure (or ordered media as they are also called) when they are described within the scheme of the continuum: then besides the usual fields of classical thermomechanics (displacement, stress, temperature, etc.) some new fields enter the picture (order parameters, microstress, etc.). This book can be used in a semester course for students who have followed already lectures on the classical theory of continua as an introduction to special topics.

Jeremy GRAY. — **Ideas of space: Euclidean, non-Euclidean and relativistic.** — Second edition. — Oxford science publications. — Un vol. broché, 15,5 × 23, de XI, 242 p. — Prix: £15.00 (broché) et £35.00 (relié). — Clarendon Press, Oxford, 1989.

In Ideas of space the author presents a lively account of the history of the development of Euclidean, non-Euclidean, and relativistic models of the shape of the universe. The author has made every attempt to keep the pre-requisites to a bare minimum. In this second edition the author has taken the opportunity to update much of the material and to add a chapter on the emerging story of the Arabic contribution to this fascinating aspect of the history of mathematics.

Izrail M. GELFAND. — **Collected papers, vol. 3.** — Edited by S.G. Gindikin, V.W. Guillemin, A.A. Kirillov, B. Kostant, S. Sternberg. — Un vol. relié, 18 × 25, de X, 1075 p. — Prix: DM 248.00. — Springer-Verlag, Berlin, 1989.

With the publication of these Collected papers in three volumes Gelfand gives a representative choice of his papers written in the last fifty years. A substantial part of the papers have been translated into English especially for this edition. — *Contents:* Integral geometry. — Cohomology and characteristic classes. — Functional integration; probability; information theory. — Mathematics of computation; cybernetics; biology. — General theory of hypergeometric functions. — Appendix. — Table of contents for volumes 1 and 2. — Bibliography and acknowledgments.

Bernard DACOROGNA. — **Direct methods in the calculus of variations.** — Applied mathematical sciences, vol. 78. — Un vol. relié, 16 × 24, de IX, 308 p. — Prix: DM 120.00. — Springer-Verlag, Berlin, 1989.

This book deals with the calculus of variations and presents the so-called direct methods for proving existence of minima. It is divided into four main parts: the first one deals with the scalar case; the second with vector valued functions; the third deals with the relaxation of nonconvex problems. Finally in the Appendix several examples of applications of the previous chapters to nonlinear elasticity and optimal design are given.

**Geometric aspects of Banach spaces : essays in honour of Antonio Plans.** — Edited by E. Martin-Peinador and A. Rodés. — London Mathematical Society lecture note series, vol. 140. — Un vol. broché, 15 × 23, de 194 p. — Prix: £15.00/$24.95. — Cambridge University Press, Cambridge, 1989.

This volume, dedicated to Professor A. Plans, concentrates on some important and contemporary themes in Banach space theory. The articles are by leading researchers and cover topics such as sequences, operators, eigenvalues, *s*-numbers and projection constants, so will be of interest to functional analysts and approximation theorists.

**Newton to Aristotle: toward a theory of models for living systems.** — Edited by John Casti, Anders Karlqvist. — Mathematical modeling, N°. 4. — Un vol. relié, 16 × 24, de VI, 284 p. — Prix: SFr. 98.00. — Birkhäuser, Boston, 1989.

This book examines the manner in which Aristotle's causal theory of events can be used to fill the modeling gaps left by the Newtonian framework. Using the tools of modern systems theory and mathematics, several internationally renowned scientists demonstrate the advantages of reintroducing the Aristotelian world view from the perspective of economics, biology, linguistics, and other areas of the life and behavioral sciences.

Benjamin FINE. — **Algebraic theory of the Bianchi groups.** — Pure and applied mathematics, vol. 129. — Un vol. relié, 16 × 23,5, de VII, 249 p. — Prix: $99.75 (U.S.A. et Canada) et $119.50 (autres pays). — Marcel Dekker, New York, 1989.

With this title readers have before them an excellent, up-to-date work covering a wide range of topics related to this important class of number theoretically defined linear groups. Replete with invaluable information that specialists can use to further their own research, the book also provides novices with a solid background in combinatorial group theory, enabling them to pursue more advanced studies.

**Semigroup theory and applications.** — Edited by Philippe Clément, Sergio Invernizzi, Enzo Mitidieri, Ioan I. Vrabie. — Lecture notes in pure and applied mathematics, vol. 116. — Un vol. broché, 18 × 25,5, de x, 454 p. — Prix: $115.00 (U.S.A. et Canada) et $138.00 (autres pays). — Marcel Dekker, New York, 1989.

A helpful resource offering results that mathematical researchers and applied scientists can use in their own work, "Semigroup theory and applications" contains in-depth coverage of such important topics as multiplicative perturbations of generators, dual and positive semigroups, semigroup methods for hyperbolic equations, quantum stochastic differential equations, functional differential equations, degenerate equations, asymptotic behavior of solutions, inverse problems, and semigroup methods in population dynamics.

**Geometrical and algebraic aspects of nonlinear field theory.** — Proceedings of the Meeting on Geometrical and Algebraic Aspects of Nonlinear Field Theory, Amalfi, Italy, May 23-28, 1988. — Edited by S. De Filippo, M. Marinaro, G. Marmo, G. Vilasi. — North-Holland delta series. — Un vol. broché, 17 × 24,5, de x, 248 p. — Prix: US$79.00/Dfl. 150.00. — North-Holland, Amsterdam, 1989.

The purpose of this meeting was to bring together people working on a wide range of subjects, but nonetheless able to profitably communicate and discuss, owing to the common interest in fundamental physical theories and to unique geometrical and algebraic language. Geometry and algebra, and to be specific algebraic geometry and topology, are not only used in the following to solve known problems, but are also of help in the very (re)formulation of a wide class of problems and of the very physical theories in a unified setting.

Barry C. ARNOLD, N. BALAKRISHNAN. — **Relations, bounds and approximations for order statistics.** — Lecture notes in statistics, vol. 53. — Un vol. broché, 16,5 × 24, de VIII, 173 p. — Prix: DM 36.00. — Springer-Verlag, New York, 1989.

This book describes in great length some relations satisfied by moments of order statistics and some methods of deriving bounds and approximations for these moments. The main purpose of the book is to present various old, as well as recent, developments in the above-mentioned three topics in order statistics and also to illustrate some of their uses. Statisticians working in the areas of order statistics, approximation theory, robust inference, goodness-of-fit, outliers, etc., will find this book quite useful.

E. BOERGER. — **Computability, complexity, logic.** — Studies in logic and the foundations of mathematics, vol. 128. — Un vol. relié, 16 × 23, de XX, 592 p. — Prix: US$118.00/Dfl. 225.00. — North-Holland, Amsterdam, 1989.

The theme of this book is formed by a pair of concepts: the concept of formal language as carrier of the precise expression of meaning, facts and problems, and the concept of algorithm or calculus, i.e. a formally operating procedure for the solution of precisely described questions and problems. The book is a unified introduction to the modern theory of these concepts, to the way in which they developed first in mathematical logic and computability theory and later in automata theory, and to the theory of formal languages and complexity theory.

John BERRY, Allan NORCLIFFE and Stephen HUMBLE. — **Introductory mathematics: through science applications.** — Un vol. broché, 17 × 24,5, de XII, 547 p. — Prix: £15.00/$29.95 (broché) et £45.00/$79.50 (relié). — Cambridge University Press, Cambridge, 1989.

This textbook, covering the basic mathematics taught to first-year students of science and engineering, reflects the growing awareness that ancillary mathematics should not be taught in isolation from its applications. Topics covered include calculus, ordinary and partial differential equations and statistics. Each chapter starts with two or three examples setting the new techniques to be studied in the context of the scientific world; the mathematics is then presented, along with worked examples. Numerical methods are integrated with analytical techniques where appropriate.

A.C. BAJPAI, L.R. MUSTOE, D. WALKER. — **Engineering mathematics.** — Second edition. — In collaboration with W.T. Martin. — Un vol. broché, 15 × 23, de XIII, 714 p. — Prix: £12.95. — John Wiley & Sons, Chichester, 1989.

In the second edition of this well-known textbook, the authors have thoroughly revised and updated the content and style of presentation, while maintaining the underlying philosophy of the book. The appearance of discrete mathematics on modern engineering syllabuses is reflected in a new chapter covering propositional logic, predicates and Boolean algebra. Among other additions, material on step functions and periodic functions has been included in the chapter on Laplace transforms. In line with today's practice, greater emphasis is placed on pocket calculator methods and microcomputer solutions to numerical problems. Real examples and case studies are used wherever possible, and analytical and numerical techniques are integrated. Listings of sample programs have been included and are also available on disk for the IBM PC and the BBC/B and Master microcomputers.

P.M. COHN. — **Algebra, vol. 2.** — Second edition. — Un vol. broché, 15 × 22,5, de XV, 428 p. — Prix: £14.95. — John Wiley & Sons, Chichester, 1989.

In this revised edition, the material originally covered in the second volume of Cohn's sucessful Algebra textbook has been divided into two. The present volume covers the more basic material as well as some topics of applied algebra, and is thus suitable for senior undergraduate and graduate studies. Volume 3, which will contain the more advanced parts of the former volume 2, as well as some new topics, will be directed at postgraduate students and intending researchers.

I. GUMOWSKI. — **Oscillatory evolution processes : quantitative analyses arising from applied science.** — Nonlinear science: theory and applications. — Un vol. relié, 16 × 24, de VI, 329 p. — Prix: £55.00. — Manchester University Press, Manchester, 1989.

This guide to the use of evolution equations in modelling the behaviour of real systems, and the analysis of experimental results will be a significant help to the many workers in empirical sciences who find it difficult to connect the abstractions of much modern nonlinear mathematical theory to their work. The intrisic regularities of apparently chaotic evolution processes are illustrated using examples drawn from actual applications, for second order nonlinear ordinary differential equations with periodic coefficients, and for third and fourth order autonomous differential equations.

P. THUILLIER, J.C. BELLOC. — **Mathématiques-Instituts universitaires de technologie: analyse 2: calcul intégral, équations différentielles.** — Un vol. broché, 16 × 24, de 295 p. — Masson, Paris, 1989.

Intégrale définie. — Méthodes d'intégration. — Généralisation de la notion d'intégrale. — Equations différentielles du 1er ordre. — Equations différentielles du 2e ordre. — Notions sur les systèmes différentiels et les équations aux dérivées partielles. — Intégrales multiples. — Inté-

grales curvilignes. Intégrales de surface. — Applications géométriques du calcul intégral. — Applications du calcul intégral à la mécanique. — Analyse vectorielle.

Derek F. HOLT and W. PLESKEN. — **Perfect groups.** — Oxford mathematical monographs. — Un vol. relié, 16 × 24, de XII, 364 p. — Prix: £35.00. — Clarendon Press, Oxford, 1989.

*Perfect groups with nontrivial Fitting subgroup:* Elementary constructions. The graph of isomorphism types of finite groups. Using infinite perfect groups. — *Systematic enumeration of finite perfect groups:* Outline of the procedure. The computation of irreducible modules. Building up the class $H \sharp p$. — *Basic structure and enumeration of perfect space groups:* Structure of crystallographic and p-adic space groups. Algorithmic determination. — *Tables of finite perfect groups:* Description of tables. Index of tables. Tables of finite perfect groups. The orders of perfect groups of order up to a million. — *Tables of perfect space groups:* Description of tables. Index of tables. Tables of perfect space groups. — *Mapping a finitely presented group onto a group in the tables:* Finding simple images of a finitely presented group. Re-writing presentations. Lifting epimorphisms. An example. Finding epimorphisms onto space groups. — *Appendix by W. Hanrath:* Character tables of some factor groups of space groups.

Ernest B. VINBERG. — **Linear representations of groups.** — Basler Lehrbücher, vol. 2. — Un vol. relié, 17 × 24, de 146 p. — Prix: SFr. 40.00. — Birkhäuser Verlag, Basel, 1989.

This textbook contains a comprehensive and detailed exposition of the fundamentals of the representation theory of groups, especially of finite groups and compact groups. The exposition is based on the decomposition of the two-sided regular representation. This enables the author to give not only an abstract description of the representations but also their realizations in function spaces, which is important for physical applications.

Nobuyuki IKEDA and Shinzo WATANABE. — **Stochastic differential equations and diffusion processes.** — Second edition. — North-Holland Mathematical Library, vol. 24. — Un vol. relié, 16 × 23, de XVI, 555 p. — Prix: US$ 147.25/DFl. 280.00. — North-Holland Publishing Co., Amsterdam, 1989.

Being a systematic treatment of the modern theory of stochastic integrals and stochastic differential equations, the theory is developed within the martingale framework, which was developed by J.L. Doob and which plays an indispensable role in the modern theory of stochastic analysis. A considerable number of corrections and improvements have been made for the second edition of this classic work. In particular, major and substantial changes are in Chapters 3 and 5 where the sections treating excursions of Brownian motion and the Malliavin calculus have been expanded and refined. Sections discussing complex (conformal) martingales and Kahler diffusions have been added.

**Mathematics in remote sensing.** — Based on the proceedings of a conference organized by the Institute of Mathematics and its Applications in Remote Sensing held at Danbury, Essex, in May 1986. — Ed. by S.R. Brooks. — The IMA Conference series, vol. 21. — Un vol. relié, 16 × 24, de XI, 399 p. — Prix: £45.00. — Oxford, Clarendon Press, 1989.

The intention of the Conference was to approach remote sensing in a thematic manner which ran through this process of information extraction, rather than adopting an approach based on sensing instruments, or on applications. Seven major topics are covered: Problem areas associated with remote sensing - Aspects of scattering theory and models — Presentation of inverse methods - Statistical methods — Analysis and assimilation of data — Aspects of spatial data — Spatial information systems and scene analysis.

John C. STRIKWERDA. — **Finite difference schemes and partial differential equations.** — The Wadsworth & Brooks/Cole mathematics series. — Un vol. relié, 17 × 24, de XII, 386 p. — Pacific Grove, Wadsworth & Brooks/Cole, 1989.

This is suitable as a graduate text or reference work in the fields of applied mathematics, engineering and the sciences. This book combines the practical aspects of implementation with a theoretical analysis of schemes and equations. The author discusses thoroughly the concepts of convergence, consistency, and stability for time-dependent equations. He uses the methods of Fourier analysis throughout the text and in particular to develop rigorously the von Neumann analysis for stability, providing a unified treatment of the basic concepts and results.

I.L. KANTOR; A.S. SOLODOVNIKOV. — **Hypercomplex numbers: an elementary introduction to algebras.** — Translated by A. Shenitzer. — Un vol. relié, 16 × 24, de X, 169 p. — Prix: DM 78.00. — Springer-Verlag, New York, 1989.

This book assumes very little on the part of the reader and teaches him about significant issues and ideas and their historical evolution. It is a gentle introduction to algebras. The first part familiarizes the reader with examples of algebras, including the quaternions and the Cayley numbers. The second part is an exposition of the fundamental concepts of linear algebra and the third part explains the unique role of the complex numbers, the quaternions and the Cayley numbers as the only real division algebras (other than the reals themselves).

**Irregularities of partitions.** — G. Halasz and V.T. Sos, editors. — Algorithms and combinatorics, vol. 8. — Un vol. broché, 16,5 × 24, de 165 p. — Prix: DM 74.00. — Springer-Verlag, Berlin, 1989.

The problem of the uniform distribution of sequences, first attacked by Hardy, Littlewood and Weyl in the early years of this century, has now become an important part of number theory. This is also true of Ramsey theory in combinatorics, whose origins can be traced back to Schur in the same period. Both concern the distribution of sequences of elements in certain collections of subsets. Quite recently these strands have become interwoven, borne fruit and developed links with such other fields as ergodic theory, geometry, information theory and algorithm theory. This volume is the summary of a workshop held at Fertöd in Hungary, which brought together people working on various aspects of Ramsey theory and on the theory of uniform distribution and related aspects of number theory.

**Geometric aspects of functional analysis, Israel seminar (GAFA) 1987-88.** — J. Lindenstrauss, V.D. Milman (eds.). — Lecture notes in mathematics, vol. 1376. — Un vol. broché, 16,5 × 24, de VII, 288 p. — Prix: DM 45.00. — Springer-Verlag, Berlin, 1989.

In these 1987-88 proceedings of the Israel GAFA-Seminar, the vast majority of articles are original research papers. The topics concentrate on the geometry of Banach spaces and the quantitative theory of convex sets in $R^n$, and also include approximation theory, dimension theory and the theory of orthogonal expansions.

Richard L. EPSTEIN; Walter A. CARNIELLI. — **Computability: computable functions, logic and the foundations of mathematics.** — The Wadsworth & Brooks/Cole mathematics series. — Un vol. relié, 19 × 24, de XVII, 297 p. — Wadsworth & Brooks/Cole Advanced Books & Software, Pacific Grove, Calif., 1989.

This book is an introduction to recursion theory, a subject that is becoming a standard requirement for computer science, mathematics, and philosophy students, and deals with a very

basic problem: What is computable? The theory of computing is recursion theory, and this book covers the fundamentals of the subject up to the deep results of Gödel, which point out the limitations of computers.

Paul B. GARRETT. — **Holomorphic Hilbert modular forms.** — The Wadsworth & Brooks/Cole mathematics series. — Un vol. relié, 17 × 24, de XIII, 304 p. — Wadsworth & Brooks/Cole Advanced Books & Software, Pacific Grove, California, 1989.

This volume is an introduction to a substantial part of the theory of holomorphic Hilbert modular forms, associated $L$-functions, and their arithmetic. As such, it is an introduction to the theory of automorphic forms in general — especially to the arithmetic of holomorphic automorphic forms. The first 5 chapters review fundamental ideas and methods to about 1960. The last 2 chapters discuss more recent arithmetic results, including a new and self-contained proof of a theorem of Shimura on rationality properties of Fourier coefficients of cusp forms.

**Modern optimal control: a conference in honor of Solomon Lefschetz and Joseph P. LaSalle.** — Ed. by Emilio O. Roxin. — Lecture notes in pure and applied mathematics, vol. 119. — Un vol. broché, 18 × 25, de XIII, 437 p. — Prix: US$ 119.50. — Marcel Dekker, New York, 1989.

In honor of Solomon Lefschetz (1884-1972) and Joseph P. LaSalle (1916-1983) whose scientific contributions figured prominently in the development of control theory and dynamical systems as we know it today, this book focuses on new advances in modern control theory and provides a historical perspective on 30 years of modern optimal control.

**Logic colloquium '87: proceedings of the colloquium held in Granada, Spain, July 20-25, 1987.** — Ed. by H.-D. Ebbinghaus *et al.* — Studies in logic and the foundations of mathematics, vol. 129. — Un vol. relié, 16 × 23, de X, 375 p. — Prix: DFl. 200.00. — North-Holland, Amsterdam, 1989.

Fourteen papers presented at the 1987 European Summer Meeting of the Association for Symbolic Logic are collected in this volume. The main areas covered by the conference were Logic, Set theory, Recursion theory, Model theory, Logic for computer science and semantics of natural languages.

**Logic colloquium '88: proceedings of the colloquium held in Padova, Italy, August 22-31, 1988.** — Ed. by R. Ferro et al. — Studies in logic and the foundations of mathematics, vol. 127. — Un vol. relié, 16 × 23, de VIII, 424 p. — Prix: DFl. 210.00. — North-Holland, Amsterdam, 1989.

The result of the European Summer Meeting of the Association for Symbolic Logic, this volume gives an overview of the latest developments in most of the major fields of logic being actively pursued today. As well as selected papers, the two panel discussions are also included, on "Trends in logic", and "The teaching of logic".

Claude BERGE. — **Hypergraphs: combinatorics of finite sets.** — North-Holland mathematical library, vol. 45. — Un vol. relié, 15,5 × 23, de IX, 255 p. — Prix: DFl. 150.00. — North-Holland, Amsterdam, 1989.

Graph theory has proved to be an extremely useful tool for solving combinatorial problems in diverse areas. It is natural to attempt to generalise the concept of a graph in order to attack additional combinatorial problems. The idea of looking at a family of sets from this standpoint

took shape around 1960. In regarding each set as a "generalised edge" and in calling the family itself a "hypergraph" it was noticed that this generalisation often led to simplification. Moreover, one single statement could unify several theorems on graphs. This book presents what seems to be the most significant work on hypergraphs.

John F. PIERCE. — **Singularity theory, rod theory, and symmetry-breaking loads.** — Lecture notes in mathematics, vol. 1377. — Un vol. broché, 16,5 × 24, de IV, 177 p. — Prix: DM 30.00. — Springer-Verlag, Berlin, 1989.

This work is addressed to both mathematicians and mechanicians. For the mathematician, it illustrates how methods of modern analysis contribute to the resolution of problems of current interest in mechanics. Conversely, the rod problem gives the mechanician a concrete context in which to learn how to use these nonlinear mathematical tools.

O. HERNANDEZ-LERMA. — **Adaptive Markov control processes.** — Applied mathematical sciences, vol. 79. — Un vol. relié, 16 × 24,5 de XIV, 148 p. — Prix: DM 78.00. — Springer-Verlag, New York, 1989.

This book is concerned with adaptive Markov processes, a class of discrete- time stochastic control systems depending on unknown parameters. Its purpose is to provide a unified, comprehensive treatment to some recent theoretical developments on the approximation and adaptive control of Markov processes.

Geoffrey GRIMMETT. — **Percolation.** — Un vol. relié, 16 × 24, de XI, 296 p. — Prix: DM 98.00. — Springer-Verlag, New York, 1989.

The mathematical theory of percolation has acquired something of a reputation for inaccessibility. In addition, several recent advances of substance have changed the historical order of discovery. This book re-examines the subject afresh, in light of recent discoveries. It contains a definitive and coherent account of the subject, in a way accesible to the non-specialist, including the shortest and neatest proofs currently known.

H.T. BANKS, K. KUNISCH. — **Estimation techniques for distributed parameter systems.** — Systems and control: foundations and applications, vol. 1. — Un vol. relié, 15,5 × 23,5 de XIII, 315 p. — Prix: SFr. 84.00. — Birkhäuser, Boston, 1989.

This treatise provides a functional analytic framework for the approximation of parameter estimation problems associated with infinite dimensional systems. Motivated by specific problems in several different areas of science such as physiology and biology, techniques are developed that allow one to estimate parameters in partial differential equations from observations of the system modeled by the equations. Aspects of parameter identifiability and stability in the context of these infinite dimensional problems are discussed.

Peter J. NICHOLLS. — **The ergodic theory of discrete groups.** — London Mathematical Society lecture note series, vol. 143. — Un vol. broché, 15 × 22,5 de XI, 221 p. — Prix: £19.50. — Cambridge University Press, Cambridge, 1989.

The interaction between ergodic theory and discrete groups has a long history and much work was done in this area by Hedlund, Hopf, and Myrberg in the 1930's. Over the last 10 years, there has been a great resurgence of interest in the field, due in large measure to the pioneering work of Dennis Sullivan. New tools have been developed and applied with success to many deep problems. The ergodic theory of discrete groups has become a substantial field of mathematical

research in its own right, and it is the aim of this book to provide an introduction from first principles to some of the major aspects of the modern theory.

**Surveys in combinatorics, 1989.** — Ed. by Johannes Siemons. — London Mathematical Society lecture note series, vol. 141. — Un vol. broché, 15 × 22,5 de VIII, 217 p. — Prix: £17.5O. — Cambridge University Press, Cambridge, 1989.

This volume contains the invited lectures given at the Twelfth British Combinatorial Conference. The lectures survey the many areas of current research activity in combinatorics and its applications, including graph theory, designs and probabilistic graphs.

Daniel E. COHEN. — **Combinatorial group theory: a topological approach.** — London Mathematical Society student texts, vol. 14. — Un vol. broché, 15 × 22,5 de X, 309 p. — Prix: £11.95. — Cambridge University Press, Cambridge, 1989.

In this book, developed from courses taught at the University of London, the author aims to show the value of using topological methods in combinatorial group theory. The topological material is given in terms of the fundamental groupoid, giving results and proofs that are both stronger and simpler than the traditional ones. Several chapters deal with covering spaces and complexes, a method which is then applied to yield the major Schreier and Kurosh subgroup theorems. The author presents a full account of Bass-Serre theory and discusses the word problem, in particular its unsolvability, and the Higman embedding theorem.

K.R. GOODEARL, R.B. WARFIELD, Jr. — **An introduction to noncommutative Noetherian rings. London Mathematical Society student texts, vol. 16.** — Un vol. relié, 15,5 × 23,5 de XVII, 303 p. — Prix: £30.00. — Cambridge University Press, Cambridge, 1989.

This introductory text is intended to be accessible to anyone with basic background in algebra. It can be used as a fist-year graduate text, or as a self-contained reference. The standard techniques in the area (rings of fractions, bimodules, Krull dimension, linked prime ideals) are introduced and applied to a variety of problems. A recurring emphasis is placed on prime ideals and injective modules to help tie the material together.

S. James PRESS. — **Bayesian statistics: principles, models, and applications.** — Wiley series in probability and mathematical statistics. — Un vol. relié, 16 × 24, de XVI, 237 p. — Prix: £27.80. — John Wiley and Sons, New York, 1989.

Uniting the essential topics in one source, this introduction to Bayesian statistics in the first broadly based compendium of its theory and practice. It traces the roots of Bayesian statistics from the period before Bayes up to the present, covering many Bayesian computer programs being applied today. Part 1 focuses on the theoretical aspects of Bayesian statistics. In part 2, models and applications are provided in step-by-step detail.

**Mathematics for large scale computing.** — Edited by J.C. Diaz. — Lecture notes in pure and applied mathematics, vol. 120. — Un vol. broché, 18 × 25, de XI, 345 p. — Prix: $85.00 (U.S.A. et Canada) et $102.00 (autres pays). — Marcel Dekker, Inc., New York, 1989.

*From the preface:* "The book contains survey articles as well as chapters on specific research applications, development and analysis of numerical algorithms, and performance evaluation of algorithms on advanced architectures. The effect of specialized architectural features on the performance of large scale computation is also considered... Several areas of applications are represented, including the numerical solution of partial differential equations, iterative

techniques for large structured problems, the numerical solution of boundary value problems for ordinary differential equations, numerical optimization, and numerical quadrature. Mathematical issues in computer architecture are also presented, including the description of gray codes for generalized hypercubes.''

KIANG Tsai-han. — **The theory of fixed point classes.** — Un vol. relié, 17 × 25, de XI, 174 p. — Prix: DM 98.00. — Springer-Verlag, Berlin, 1989.

The present book is an English translation of the revised second Chinese edition. The first Chinese edition was published by Science Press Beijing in 1979. It is a fundamental representation of the important theory, presented in a more elementary and geometric way than the existing literature. Thus, it will serve as a good introduction to the important field of algebraic topology and geometry.

David W. COHEN. — **An introduction to Hilbert space and quantum logic.** — Problem books in mathematics. — Un vol. relié, 16 × 24,5, de XII, 149 p. — Prix: DM 79.00. — Springer-Verlag, New York, 1989.

Historically, nonclassical physics developed in three stages. First came a collection of ''ad hoc'' assumptions and then a cookbook of equations known as ''quantum mechanics''. The equations and their philosophical underpinnings were then collected into a model based on the mathematics of Hilbert space. From the Hilbert space model came the abstraction of ''quantum logics''. This book explores all three stages, but not in historical order. Instead, in an effort to illustrate how physics and abstract mathematics influence each other we hop back and forth between a purely mathematical development of Hilbert space, and a physically motivated definition of a logic, partially linking the two throughout, and then bringing them together at the deepest level.

**Estimation and analysis of insect populations.** — Proceedings of a Conference held in Laramie, Wyoming, January 25-29, 1988. — Lecture notes in statistics, vol. 55. — Un vol. broché, 16,5 × 24, de XIV, 492 p. — Prix: DM 100.00. — Springer-Verlag, Berlin, 1989.

This book is about estimation of population parameters in stage frequency structured populations and the subsequent use of this information in development of mathematical and computer models. This book will be of interest to advanced undergraduate and graduate students, and research scientists in the fields of statistics, entomology, and other areas of applied population ecology.

Gunnar BLOM. — **Probability and statistics: theory and applications.** — Springer texts in statistics. — Un vol. relié, 16 × 24, de XI, 356 p. — Prix: DM 124.00. — Springer-Verlag, New York, 1989.

This is an extended and modified translation of the third Swedish edition which has been used at the Royal Institute of Technology in Stockholm and at the School of Engineering at Linkoping University. This book is intended for students who are interested in combining elementary probability theory and statistical theory with applications, and something about the planning of practical investigations in their course of study. A working knowledge of elementary calculus, in particular derivates and Riemann integrals, is an essential prerequisite.

**Applications of matrix theory.** — Based on the proceedings of a conference organized by the Institute of Mathematics and its Applications on Applications of Matrix Theory, held in the University of Bradford in July 1988. — Edited by M.J.C. Gover and S. Barnett. — The Institute

of Mathematics and its Applications conference series. New ser., vol. 22. — Un vol. relié, 16 × 24, de XIII, 324 p. — Prix: £40.00. — Clarendon Press, Oxford, 1989.

*From the preface:* Linear algebra is one of the most widely used mathematical tools, finding application in virtually all branches of science and engineering. There have also been many conferences on linear algebra and matrix theory over the past few years... The aim of this conference was slightly different from some previous ones in that its primary objective was to concentrate on general applications of matrix theory... The majority of attendees presented papers, these being on a wide range of topics including control theory, optimisation, statistics, economics and biology as well as numerical linear algebra and matrix theory.

Jean-Louis JARDRIN. — **Analyse: algorithmes et programmes en Pascal: Turbo Pascal, MS Pascal, Pascal UCSD.** — Un vol. broché, 18 × 21, de X, 340 p. — Prix: FF 150.00. — Dunod, Paris, 1989.

Cet ouvrage présente un ensemble de méthodes relevant de l'analyse mathématique, illustrées de nombreux programmes en Turbo Pascal. La partie théorique du livre constitute une initiation à l'analyse mathématique numérique. Les algorithmes décrits sont classiques, simples, efficients et se présentent sous une forme mathématique rigoureuse qui facilite leur programmation sans altérer leur caractère universel, et peuvent donc être transcrits dans tout langage adapté au calcul scientifique (APL, Fortran IV etc...) La partie pratique rassemble une bibliothèque de programmes et de sous-programmes en Turbo Pascal. Toutes les indications sont données en annexe pour les transcrire en MS Pascal, Pascal UCSD...

Alan RUEGG. — **Processus stochastiques: avec applications aux phénomènes d'attente et de fiabilité.** — Méthodes mathématiques pour l'ingénieur, vol. 6. — Un vol. broché, 16 × 24, de XIII, 150 p. — Prix: SFr. 38.00. — Presses polytechniques romandes, Lausanne, 1989.

Les ingénieurs, mais aussi les informaticiens, physiciens, biologistes, sociologues et beaucoup d'autres spécialistes, font appel à la modélisation par les processus stochastiques. Cet ouvrage se veut une introduction aux processus stochastiques à valeur discrète et traite principalement: les chaînes de Markov à temps discret, les processus de Poisson, les processus de naissance et de mort ainsi que leur généralisation, les chaînes de Markov à temps continu. Il offre également une introduction aux systèmes d'attente, y compris certains modèles non markoviens. Il se termine par un chapitre consacré au traitement probabiliste de certains problèmes de fiabilité. Une série de problèmes est proposée à la fin de chaque chapitre et les résultats sont donnés en annexe.

V.S. VARADARAJAN. — **An introduction to harmonic analysis on semisimple Lie groups.** — Cambridge studies in advanced mathematics, vol. 16. — Un vol. relié, 15,5 × 23,5, de X, 316 p. — Prix: £40.00. — Cambridge University Press, Cambridge, 1989.

This graduate-level textbook is an introduction to the representation theory of semisimple Lie groups. As such, it will be suitable for research students in algebra and analysis, and for research mathematicians requiring a readable account of the topic. The author emphasizes the development of the central themes of the subject in the context of special examples, without losing sight of its general flow and structure.

**Séminaire de probabilités XXIII.** — J. Azéma, P.A. Meyer, M. Yor, eds. — Lecture notes in mathematics, vol. 1372. — Un vol. broché, 16,5 × 24,5, de IV, 583 p. — Prix: DM 98.00. — Springer-Verlag, Berlin, 1989.

Besides a number of papers on classical areas of research in probability such as martingale theory, Malliavin calculus and 2-parameter processes, this new volume of the Séminaire de Probabilités develops the following themes: chaos representation for some new kinds of martingales, quantum probability, branching aspects on Brownian excursions, Brownian motion on a set of rays.

**Statistical modelling: proceedings of GLIM 89 and the 4th International Workshop on Statistical Modelling held in Trento, Italy, July 17-21, 1989.** — A. Decarli, B.J. Francis, R. Gilchrist, G.U.H. Seeber (eds.). — Lecture notes in statistics, vol. 57. — Un vol. broché, 16,5 × 24,5 de IX, 343 p. — Prix: DM 70.00. — Springer-Verlag, Berlin, 1989.

The meeting in Trento aimed to bring together researchers interested in the development and application of generalized linear modelling in GLIM and those interested in statistical modelling in its widest sense. The Programme Comittee specifically requested non-theoretical papers in addition to considering theoretical contributions. Thus there are papers in a wide range of practical areas, such as radio spectral occupancy, comparison of birthweights, intervals between births, accidents of railway workers, etc.

**Differential equations: Proceedings of the EQUADIFF conference.** — Ed. by C.M. Dafermos, G. Ladas, G. Papanicolaou. — Lecture notes in pure and applied mathematics, vol. 118. — Un vol. broché, 17,5 × 25 de XI, 787 p. — Prix: US$125.00 (US & Canada), US$150.00 (autres pays). — Marcel Dekker, New York, 1989.

Despite the tremendous expansion of research in differential equations and their applications, recent trends point toward unification rather than diversification. In fact, the traditional division of the field into "ordinary", "partial", and "functional" differential equations has lost much of its meaning under the realization that these subareas share concepts, ideas, and techniques. EQUADIFF conferences, initiated in 1970, seek to present a panorama of research in differential equations and to promote unification by bringing together mathematicians and scientists from many parts of the world who work on different aspects of the field.

Dick CLEMENTS. — **Mathematical modelling: a case study approach.** — Un vol. relié, 15,5 × 23,5 de VIII, 166 p. — Prix: £25.00. — Cambridge University Press, Cambridge, 1989.

This book describes mathematical modelling and its applications to the solution of problems in industry and commerce. After an introduction to the principles of mathematical modelling, the author offers some insights into practical aspects of the branch. In later chapters seven case studies, based on real problems contributed by mathematicians working in industry, are introduced. Each chapter describes a problem, the solution originally adopted and variations on that solution introduced by students over a number of years use of the case studies.

Dikran N. DIKRANJAN, Ivan R. PRODANOV, Luchezar N. STOYANOV. — **Topological groups: characters, dualities, and minimal group topologies.** — Pure and applied mathematics, vol. 130. — Un vol. relié, 16 × 23,5, de X, 287 p. — Prix: $99.75 (USA et Canada), $119.50 (autres pays). — Marcel Dekker, New York, 1990.

Using only tools of functional analysis that belong to general topology, this informative volume focuses on the theory of topological groups as it relates to characters, dualities, and minimal group topologies. Presenting many new, previously unpublished results, "Topological groups" considers applications of Følner's theorem, particularly to minimal group topologies, and develops the theory of characters in locally compact abelian groups, including Pontryagin duality and the structure theory of locally compact abelian groups.

Manuel de LEON, Paulo R. RODRIGUES. — **Methods of differential geometry in analytical mechanics.** — North-Holland mathematics studies, vol. 158. — Un vol. relié, 17 × 24,5, de X, 483 p. — Prix: US$110.50/Dfl. 210.00. — North-Holland, Amsterdam, 1989.

The differential geometric formulation of analytical mechanics not only offers a new insight into mechanics, but also provides a more rigorous formulation of its physical content from a mathematical viewpoint. Topics covered in this volume include differential forms, the differential geometry of tangent and cotangent bundles, almost tangent geometry, symplectic and presymplectic Lagrangian and Hamiltonian formalisms, tensors and connections on manifolds, and geometrical aspects of variational and constraint theories.

Kiiti MORITA and Jun-iti NAGATA. — **Topics in general topology.** — North-Holland mathematical library, vol. 41. — Un vol. relié, 15,5 × 23, de XI, 747 p. — Prix: US$197.25/ Dfl. 375.00. — North-Holland, Amsterdam, 1989.

Being an advanced account of certain aspects of general topology, the primary purpose of this volume is to provide the reader with an overview of recent developments. The papers cover basic fields such as metrization and extension of maps, as well as newly-developed fields like catagorical topology and topological dynamics.

**Let Newton be!** — Ed. by John Fauvel, Raymond Flood, Michael Shortland and Robin Wilson. — Un vol. broché, 19 × 24,5 de 272 p. — Prix: £8.95. — Oxford University Press, Oxford, 1989.

The work of historians has recently uncovered the extraordinary variety of Newton's work from mathematics to theology, from mechanics to music, and from optics to alchemy. A major theme of this book is to explore these diverse facets and to show through examining our knowledge of their social context how they were all components of one person's work.

Joachim HILGERT, Karl Heinrich HOFMANN and Jimmie D. LAWSON. — **Lie groups, convex cones, and semigroups.** — Oxford mathematical monographs. — Un vol. relié, 19,5 × 25,5 de XXXVIII, 645 p. — Prix: £55.00. — Oxford University Press, Oxford, 1989.

This book focuses on a new aspect of the theory of Lie groups and Lie algebras, namely, the consideration of semigroups in Lie groups. The systematic development of a Lie theory of semigroups is motivated by their recent emergence in different contexts. Notably, they appeared at certain points in geometric control theory and in the theory of causal structures in mathematical physics. Beyond that, it is becoming increasingly clear that the broader perspective of considering not just the analytic subgroups of a Lie group, but the appropriate subsemigroups as well, leads to a fuller and richer theory of the original Lie group itself. Hence it is appropriate to consider this work as a new branch of Lie group theory, too.

Johannes C.C. NITSCHE. — **Lectures on minimal surfaces, vol. 1: introduction, fundamentals, geometry and basic boundary value problems.** — Un vol. relié, 16 × 23,5, de XXV, 563 p. — Prix: £70.00. — Cambridge University Press, 1989.

This monograph deals with parametric minimal surfaces in Euclidean space. The author presents a broad survey which extends from the classical beginnings to the current situation whilst highlighting many of the subject's main features and interspersing the mathematical development with pertinent historical remarks. The presentation is complete and is complemented by a bibliography of nearly 1600 references. The emphasis on geometric aspects ensure that the work can be used for graduate level courses in mathematics.

Seán DINEEN. — **The Schwarz lemma.** — Oxford mathematical monographs. — Un vol. relié, 16,5 × 24, de X, 248 p. — Prix: £25.00. — Clarendon Press, Oxford, 1989.

The classical Schwarz lemma. — A Schwarz lemma for plurisubharmonic functions. — The Poincaré distance on the unit disc. — Schwarz-Pick systems of pseudodistances. — Hyperbolic manifolds. — Special domains. — Pseudometrics defined using the (complex) Green function. — Holomorphic curvature. — The algebraic metric of Harris. — A holomorphic characterization of Banach spaces. — Fixed point theorems. — The analytic Radon-Nikodym property.

**Transport theory, invariant imbedding, and integral equations.** — Proceedings in honor of G.M. Wing's 65th birthday. — Lecture notes in pure and applied mathematics, vol. 115. — Un vol. broché, 18 × 25,5, de XXVI, 444 p. — Prix: $110.00 (USA et Canada), $132.00 (Autres pays). — Marcel Dekker, Inc., New York, 1989.

Furthering the ideas first proposed by Dr. Wing, this book focuses on transport theory, examining novel physical applications and theories of associated computational methods ... invariant embedding, highlighting recent extensions of this methodology to multidimensional problems ... and integral equations, discussing integral equations of the first kind, particularly their numerical resolution and several real applications in which ill- conditioned problems arise.

S. VAJDA. — **Fibonacci and Lucas numbers, and the Golden Section : theory and applications.** — Un vol. relié, 17,5 × 25, de 189 p. — Ellis Horwood series in mathematics and its applications. — Prix: £25.00. — Ellis Horwood Limited, Chichester, distributed by John Wiley and Sons, 1989.

This text begins with an overview of problems in which Fibonacci numbers arise. The Golden Section, studied in antiquity, is a mystical principle allegedly expressing aesthetic harmony. More recently the Fibonacci principle of forming a new number by appropriate combination of previous numbers has been extended to yield sequences. These are the so-called Meta-Fibonacci sequences. A discussion of Meta-Fibonacci numbers precedes a look at the Golden Section in the plane and space. Platonic solids are described and some of their less familiar features are exhibited.

A.E. BROUWER, A.M. COHEN, A. NEUMAIER. — **Distance-regular graphs.** — Ergebnisse der Mathematik und ihrer Grenzgebiete, 3. Folge, Bd. 18. — Un vol. relié, 17 × 25, de XVII, 495 p. — Prix: DM 148.00. — Springer-Verlag, Berlin, 1989.

The interplay between regularity and symmetry properties of graphs is the theme of this book. Starting from very elementary regularity properties, the concept of a distance-regular gaph arises naturally as a common setting for regular graphs which are extremal in one sense or another. Several other important regular combinatorial structures are then shown to be equivalent to special families of distance-regular graphs. Other subjects of more general interest, such as regularity and extremal properties in graphs, association schemes, representations of graphs in euclidean space, groups and geometries of Lie type, groups acting on graphs, and codes are covered independently. Many new results and proofs and more than 750 references increase the encyclopaedic value of this book.

Robert S. RUMELY. — **Capacity theory on algebraic curves.** — Lecture notes in mathematics, vol. 1378. — Un vol. broché, 16,5 × 24, de III, 437 p. — Prix: DM 69.00. — Springer-Verlag, Berlin, 1989.

Capacity is a measure of size for sets, with diverse applications in potential theory, probability and number theory. This book lays foundations for a theory of capacity for adelic

sets on algebraic curves. Its main result is an arithmetic one, a generalization of a theorem of Fekete and Szegö which gives a sharp existence/finiteness criterion for algebraic points whose conjugates lie near a specified set on a curve.

**Number theory : proceedings of the Journées Arithmétiques held in Ulm, FRG, September 14-18, 1987.** — Edited by H.P. Schlickewei, E. Wirsing. — Lecture notes in pure and applied mathematics, vol. 1380. — Un vol. broché, 16,5 × 24, de v, 266 p. — Prix: DM 45.00. — Springer-Verlag, Berlin, 1989.

15 exposés par: W.D. Brownawell, P. Erdös, J.L. Nicolas, M. Szalay, G. Frey, A. Geroldinger, R. Gillard, D.R. Heath-Brown, Y. Hellegouarch, M. Jutila, H.G. Kopetzky, A. Leutbecher, G. Niklasch, M.B. Nathanson, A. Pethö, R. Schulze-Pillot , J.H. Silverman, M.F. Vignéras.

Ian STEWART. — **Galois theory.** — Second edition. — Un vol. broché, 15,5 × 23,5, de XXX, 202 p. — Prix: £11.95. — Chapman and Hall, London, 1989.

This is the second edition of a well-established and popular text. The treatment is rigorous, but is motivated by discussion and examples, and lightened by the inclusion of historical material. In particular, the turbulent life of Evariste Galois is described in detail. The new edition includes photographs of historical documents, such as the last pages written by Galois, and extracts from Gauss's notebook. There are over 200 exercises, including hints and a selection of solutions.

**U.S.A. mathematical olympiads: 1972-1986. Compiled with solutions by Murray S. Klamkin.** — New mathematical library, vol. 33. — Un vol. broché, 15 × 23, de XIII, 127 p. — Prix: £13.10. — The Mathematical Association of America, Washington, D.C., 1989, distributed by John Wiley and Sons, Chichester.

In this book, the compiler brings together 75 original USA Mathematical Olympiad problems, with many improvements, extensions, finger exercises, open problems, references and solutions, often showing alternative approaches. The problems and their solutions are coded by subject. Included is a glossary of frequently used terms and theorems and a comprehensive bibliography. This is a collection of problems and solutions of arresting ingenuity, all accessible to secondary school students.

Karl-Heinz BECKER, Michael DOERFLER. — **Dynamical systems and fractals: computer graphics experiments in Pascal.** — Translated by Ian Stewart. — Un vol. broché, 15 × 22,5, de XII, 398 p. — Prix: £10.95/19.95 (relié: £30.00/59.50). — Cambridge University Press, Cambridge, 1989.

This book is about chaos, fractals and complex dynamics and is adressed to all people who enjoy using computers. The mathematics has been kept simple. The introduction is achieved through the extensive use of computer graphics. The first part of the book describes the most interesting problems with a solution in the form of a computer program. In the second part, example programs are given for specific machines and operating systems (MS-DOS, Turbo-Pascal, UNIX 4.2 BSD with Berkeley Pascal and C). Other implementations of the graphics routines are given for Apple Macintosh, Apple IIE/GS, Atari ST.

**Number theory and dynamical systems.** — Edited by M.M. Dodson and J.A.G. Vickers. — London Mathematical Society lecture note series, vol. 134. — Un vol. broché, 15 × 22,5, de 172 p. — Prix: £15.00/24.95. — Cambridge University Press, Cambridge, 1989.

This volume contains selected contributions from a meeting on number theory and dynamical systems held at the University of York in 1987. There are close and surprising connections between number theory and dynamical systems. As well as containing current work and results on the relationship between these subjects, one old and one new, the book also includes some more speculative and exploratoy work which should stimulate interest in new approaches to old problems.

G.W. BLUMAN, S. KUMEI. — **Symmetries and differential equations.** — Applied mathematical sciences, vol. 81. — Un vol. relié, 16 × 24, de XIII, 412 p. — Prix: DM 114.00. — Springer-Verlag, New York, 1989.

A major portion of this book discusses work which has appeared since the publication of the book "Similarity methods for differential equations", Springer-Verlag, 1974, by the first author and J.D. Cole. The present book includes a thorough and comprehensive treatment of Lie groups of transformations and their various uses for solving ordinary and partial differential equations. No knowledge of group theory is assumed. Emphasis is placed on explicit computational algorithms to discover symmetries admitted by differential equations and to construct solutions resulting from symmetries. Almost all of the examples are taken from physical and engineering problems.

G. HISS and K. LUX. — **Brauer trees of sporadic groups.** — Oxford science publications. — Un vol. relié, 16,5 × 24, de X, 525 p. — Prix: 40.00. — Clarendon Press, Oxford, 1989.

*From the preface:* This book compiles the Brauer trees of the sporadic simple groups and their covering groups, as far as they are known. Up to algebraic conjugacy, all trees but 10 are determined... From this work originated the Ph. D. thesis of the second named author. His dissertation has been almost completely included in the present volume... chapter 4 on Green correspondence will be of some interest to people working on Brauer trees. It describes (partly with proofs) the most powerful methods known to determine the Brauer tree of a block with a cyclic defect group...

Christian BLATTER. — **Ingenieur Analysis.** — Deux vol. brochés, 15 × 21, de VI, 233 p. et de 291 p. respectivement. — Prix: Vol. 1, SFr. 29.50 et vol. 2, SFr. 36.00. — Verlag der Fachvereine, Zürich, 1989.

*Bd. 1:* Grundstrukturen: Logik. Mengen. Natürliche Zahlen. Reelle Zahlen. Koordinaten in der Ebene und im Raum. Vektoralgebra. Komplexe Zahlen. — Funktionen: Erscheinungsformen. Eigenschaften von Funktionen. Grenzwerte. Folgen und Reihen. Die Exponentialfunktion. — Differentialrechnung: Grundbegriffe, Rechenregeln. Extrema. Der Mittelwertsatz der Differentialrechnung. Taylor-Approximation. Differentialgleichungen I. — *Bd. 2:* Integralrechnung: Der Integralbegriff. Hauptsätze. Technik des Integrierens. Uneigentliche Integrale. Mehrfache Integrale. Differentialgleichungen II. — Mehrdimensionale Differentialrechnung: Grundbegriffe. Höhere partielle Ableitungen, Taylorsche Formel. Die Funktionalmatrix. Extrema. Kurvenscharen in der Ebene. — Vektoranalysis: Vektorfelder, Linienintegrale. Die Greensche Formel für ebene Bereiche. Der Satz von Gauss und von Stokes.

Christian BLATTER. — **Lineare Algebra für Ingenieure, Chemiker und Naturwissenschafter.** — Un vol. broché, 14,5 × 21, de IV, 121 p. — Prix: SFr. 26.00. — Verlag der Fachvereine (VDF), Zürich, 1989.

Die lineare Algebra gehört zu den mathematischen Grundlagenfächern. Unsere erstsemestrigen Studenten können sich aber darunter meist nicht viel vorstellen. Aus diesem Grund ist dem

eigentlichen Kurs ein einführendes Kapitel vorangestellt, in dem das Feld der linearen Algebra einigermassen abgesteckt wird. Für die meisten der angezogenen Problemkreise wird in den folgenden Kapiteln die allgemeine Theorie geliefert: Matrizen, lineare Gleichungssysteme, Begriff des Vektorraumes, Dimension und Rang, etc. Soweit wie möglich werden die angesagten Objekte tatsächlich „konstruiert"; numerische Methoden im eigentlichen Sinn werden aber nicht behandelt.