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BULLETIN BIBLIOGRAPHIQUE

Alexandru BUIUM. — **Differential algebra and diophantine geometry.** — Actualités mathématiques. — Un vol. broché, $17,5 \times 24$, de 181 p. — Prix : FF 130.00. — Hermann, Paris, 1994.

The book develops an analogue of algebraic geometry in which “algebraic equations” are replaced by “algebraic differential equations”. The starting point of the theory is the classical differential algebra due to Ritt and Kolchin of which a brief self-contained exposition is included. The theory culminates with the proof of the “differential algebraic analogues” of some basic diophantine results.

Alain GRIGIS, Johannes SJÖSTRAND. — **Microlocal analysis for differential operators: an introduction.** — London Mathematical Society lecture note series, vol. 196. — Un vol broché, 15×23 , de 151 p. — Prix : £ 19.95. — Cambridge University Press, Cambridge, 1994.

This short introduction to microlocal analysis is presented, in the spirit of Hörmander in the classical framework of partial differential equations. The authors emphasise the basic tools, especially the method of stationary phase, and they discuss wavefront sets, elliptic operators, local symplectic geometry, and WBK-constructions.

Jiri ADAMEK, Jiri ROSICKY. — **Locally presentable and accessible categories.** — London Mathematical Society lecture notes series, vol. 189. — Un vol. broché, 15×23 , de xiv, 316 p. — Prix : £ 25.00. — Cambridge University Press, Cambridge, 1994.

The concepts of a locally presentable category and an accessible category have turned out to be extremely useful in formulating connections between universal algebra, model theory, logic and computer science. The aim of this book is to provide an exposition of both the theory and the applications of these categories at a level accessible to graduate students.

Washek F. PFEFFER. — **The Riemann approach to integration: local geometric theory.** — Cambridge tracts in mathematics, vol. 109. — Un vol. relié, $15,5 \times 23,5$, de xiv, 302 p. — Prix : £ 30.00. — Cambridge University Press, Cambridge, 1993.

This book presents a detailed and mostly elementary exposition of the generalized Riemann integrals discovered by Henstock, Kurzweil, and McShane. Along with the classical results, it contains some recent developments connected with lipeomorphic change of variables, higher dimensional multipliers, and the divergence theorem for discontinuously differentiable vector fields.

David HILBERT. — **Theory of algebraic invariants.** — Cambridge mathematical library. — Un vol. broché, $15,5 \times 23$, de xiv, 191 p. — Prix : £ 12.95 (relié : £ 25.00). — Cambridge University Press, Cambridge, 1993.

This book is an English translation of the handwritten notes taken by Sophus Marxsen from the course of Hilbert on invariant theory given at the University of Göttingen in 1897. This lectures take into account both the old approach of his predecessors and his new ideas. This bridge from nineteenth- to twentieth- century mathematics makes these lecture notes a special and fascinating account of invariant theory.

Lynn Margaret BATTEN, Albrecht BEUTELSPACHER. — **The theory of finite linear spaces: combinatorics of points and lines.** — Un vol. relié, $15,5 \times 23,5$, de x, 214 p. — Prix : £ 30.00. — Cambridge University Press, Cambridge, 1993.

This is the first comprehensive text to cover finite linear spaces. In eight chapters the authors introduce and review fundamental results and go on to cover the major areas of interest in linear spaces. A combinatorial approach is used for the greater part of the book, but in the final chapter recent advances in group theory relating to finite linear spaces are presented.

Patrice TAUVEL. — **Exercices de mathématiques pour l'agrégation: Algèbre 2.** — Un vol. broché, $16,5 \times 24$, de 275 p. — Prix : FF 148.00. — Masson, Paris, 1994.

Ce recueil contenant 292 exercices corrigés d'algèbre linéaire, correspond au second recueil d'exercices de l'ouvrage de cours de P. Tauvel préparant à l'épreuve écrite de l'agrégation de mathématiques. Il traite successivement des polynômes, des déterminants, des matrices, des espaces hermitiens, des espaces euclidiens, enfin des formes quadratiques.

Jacques VAUTHIER, Jean-Jacques PRAT. — **Cours d'analyse mathématique de l'agrégation.** — 2ème édition revue et corrigée. — Un vol. broché, 16×24 , de 212 p. — Prix : FF 151.00. — Masson, Paris, 1994.

L'ouvrage permet d'aborder les problèmes posés dans leur unité et leur cohérence d'ensemble, se présentant comme une coupe transversale des grandes lignes directrices de l'analyse, plutôt que comme un traité exhaustif. L'exposé comporte des démonstrations complètes et divers exemples ; il est destiné à servir de base de travail pour s'entraîner à l'écrit comme à l'oral du concours.

Jean-Pierre FERRIER. — **Mathématiques pour la licence: variable complexe, calcul différentiel et tensoriel, espaces normés et calcul intégral, analyse de Fourier.** — 2ème édition revue et corrigée. — Second cycle des Universités et écoles d'ingénieurs. — Un vol. relié, $17,5 \times 24$, de 244 p. — Prix : FF 137.00. — Masson, Paris, 1994.

Ce cours traite de l'essentiel des mathématiques enseignées en licence et en 1ère année d'écoles d'ingénieurs. Les exercices présentés et corrigés constituent des démonstrations des propositions, des lemmes et des théorèmes énoncés, suivant une approche très pragmatique, permettant une consultation ponctuelle et autonome. Cette deuxième édition, revue et corrigée, comporte en outre quelques compléments sur les distributions tempérées.

E. WALTER, L. PRONZATO. — **Identification de modèles paramétriques à partir de données expérimentales.** — Modélisation, analyse, simulation, commande. — Un vol. broché, 16×24 , de xx, 371 p. — Prix : FF 190.00. — Masson, Paris, 1994.

La construction de modèles mathématiques à partir de données expérimentales, activité de base du chercheur et de l'ingénieur, suscite de nombreuses interrogations auxquelles cet ouvrage vise à répondre, de façon aussi didactique que possible. Contient : — Introduction. — Structures de modèles. — Critères. — Optimiseurs. — Incertitude sur les paramètres. — Planification d'expériences. — Analyse critique des résultats.

Jean-Pierre AUBIN. — **Initiation à l'analyse appliquée.** — Un vol. broché, 16×24, de xxxi, 394 p. — Prix : FF 190.00. — Masson, Paris, 1994.

Ces leçons d'analyse appliquée introduisent et développent les principaux concepts topologiques dans le cadre élémentaire des espaces métriques. Domaines abordés : les pseudo-inverses de matrices, la reconnaissance des formes, les réseaux de neurones, la morphologie mathématique, les ensembles flous, l'optimisation, la théorie de jeux non coopératifs, l'équilibre walrassien en économie, les théorèmes de viabilité pour les équations différentielles, un aperçu sur une des propriétés du chaos, etc.

Harold R. JACOBS. — **Mathematics, a human endeavor: a book for those who think they don't like the subject.** — Third edition. — Un vol. broché, 19,5×26, de xiii, 678 p. — Prix : £23.95. — W.H. Freeman and Company, New York, 1994.

Mathematical ways of thinking. — Number sequences. — Functions and their graphs. — Large numbers and logarithms. — Symmetry and regular figures. — Mathematical curves. — Methods of counting. — The mathematics of chance. — An introduction to statistics. — Topics in topology. — Basic ideas and operations.

Mathematical results in quantum mechanics. — International Conference in Blossin (Germany), May 17-21, 1993. — Edited by M. Demuth, P. Exner, H. Neidhardt, V. Zagrebnov. — Operator theory, vol. 70. — Un vol. relié, 17,5×24, de x, 356 p. — Prix : SFr. 128.00. — Birkhäuser Verlag, Basel, 1994.

This book is addressed to a wide audience of mathematicians and physicists. The reader will find sections not only on traditional subjects such as Schrödinger and Dirac operators and generalized Schrödinger generators, but also on stochastic spectral analysis, many-body problems and statistical physics, chaos, and operator theory and its applications.

A. ASHYRALYEV, P.E. SOBOLEVSKII. — **Well-posedness of parabolic difference equations.** — Translated from the Russian by A. Iacob. — Operator theory, vol. 69. — Un vol. relié, 17,5×24, de xiv, 349 p. — Prix : SFr. 188.00. — Birkhäuser Verlag, Basel, 1994.

The present monograph is devoted to the construction of highly accurate difference schemes for parabolic boundary value problems, based on Padé approximations. The investigation is based on a new notion of positivity of difference operators in Banach spaces, which allows one to deal with difference schemes of arbitrary order of accuracy. The proofs are based on results in interpolation theory of linear operators.

Anatolij ANTONEVICH and Andrei LEBEDEV. — **Functional differential equations: vol. 1, C^* -theory.** — Pitman monographs and surveys in pure and applied mathematics, vol. 70. — Un vol. relié, 16,5×24, de 504 p. — Prix : £76.00. — Longman Scientific and Technical, Harlow, Essex, 1994.

This book provides an up-to-date exposition of a relatively new field of modern analysis lying in between differential equations and C^* -algebras, and in fact deeply intersecting both of these subjects. The problems considered arise from the investigation of non local functional differential operators containing transformation operators of an argument.

Progress in partial differential equations: the Metz surveys, vol. 2. — Edited by M. Chipot. — Pitman research notes in mathematics, vol. 296. — Un vol. broché, 17×25, de 230 p. — Prix : £26.00. — Longman Scientific and Technical, Harlow, Essex, 1994.

This volume collects parts of the conferences given at the University of Metz during the 1992 "Metz Days". Various important topics in partial differential equations are concerned: phase transition, evolution problems, bifurcation, stability, elliptic and parabolic problems. A special attempt has been made to make the results and techniques presented accessible to young researchers and non specialists.

I.M. GELFAND, M.M. KAPRANOV, A.V. ZELEVINSKY. — **Discriminants, resultants, and multidimensional determinants.** — Mathematics: theory and applications. — Un vol. relié, 16×24, de x, 523 p. — Prix : SFr. 138.00. — Birkhäuser, Boston, 1994.

This book presents a systematic study of discriminants and resultants in the general context of projective algebraic geometry. The classical Cayley method is complemented by using such tools as coherent sheaves, perverse sheaves, microlocal geometry, and D-modules. The authors also present their results relating discriminants and resultants with general hypergeometric functions and geometry of convex polytopes and triangulations.

Theodore W. PALMER. — **Banach algebras and the general theory of *-algebras, vol. 1: Algebras and Banach algebras.** — Encyclopedia of mathematics and its applications, vol. 49. — Un vol. relié, 16×24, de x, 794 p. — Prix : £60.00. — Cambridge University Press, Cambridge, 1994.

This is the first volume of a two volume set that provides a modern account of basic Banach algebra theory including all known results on general Banach *-algebras. This account emphasizes the role of *-algebraic structure and explores the algebraic results which underlie the theory of Banach algebras and *-algebras. This first volume is an independent, self-contained reference on Banach algebra theory.

F.S. MACAULAY. — **The algebraic theory of modular systems.** — With a new introduction by Paul Roberts. — Cambridge mathematical library. — Un vol. broché, 15×23, de xxxi, 112 p. — Prix : £12.95. — Cambridge University Press, Cambridge, 1994.

Many of the ideas introduced by Macaulay in this book have developed into central concepts in what has become the branch of mathematics known as commutative algebra. An introduction by Professor Paul Roberts links past with present. The background to Macaulay's thinking is discussed, and the development of modern theory is outlined.

S. ZAIDMAN. — **Topics in abstract differential equations.** — Pitman research notes in mathematics series, vol. 304. — Un vol. broché, 16,5×24,5, de xii, 188 p. — Prix : £26.00. — Longman Scientific & Technical, Harlow, Essex, 1994.

This subject is a new branch of operator theory and of partial differential equations, and has become a rapidly growing field of mathematics. Well-posed problems are studied in the context of the theory of operator groups and semigroups as well as in the framework of time-dependent evolution equations; non well-posed problems are also considered.

Manfred STOLL. — **Invariant potential theory in the unit ball of C^n .** — London Mathematical Society lecture note series, vol. 199. — Un vol. broché, 15×23, de x, 173 p. — Prix : £19.95. — Cambridge University Press, Cambridge, 1994.

Notation and preliminary results. — The Bergman kernel. — The Laplace-Beltrami operator. — Invariant harmonic and subharmonic functions. — Poisson-Szegö integrals. — The Riesz decomposition theorem. — Admissible boundary limits of Poisson integrals. — Radial and admissible boundary limits of potentials. — Gradient estimates and Riesz potentials. — Spaces of invariant harmonic functions.

Andrew BRUCKNER. — **Differentiation of real functions.** — CRM monograph series, vol. 5. — Un vol. relié, 18×26 , de XI, 191 p. — Prix : US\$53.00. — American Mathematical Society, Providence, R.I., 1994.

Darboux functions. Darboux functions in the first class of Baire. Continuity and approximate continuity of derivatives. The extreme derivatives of a function. Reconstruction of the primitive. The Zahorski classes. The problem of characterizing derivatives. Derivatives a.e. and generalizations. Transformations via homeomorphisms. Generalized derivatives. Monotonicity. Stationary and determining sets. Behavior of typical continuous functions. Miscellaneous topics. Recent developments.

David RUELLE. — **Dynamical zeta functions for piecewise monotone maps of the interval.** — CRM monograph series, vol. 4. — Un vol. relié, 18×26 , de VII, 62 p. — Prix : US\$38.00. — American Mathematical Society, Providence, R.I., 1994.

The first part of this book presents a general introduction to this subject. The second part is a detailed study of the zeta functions associated with piecewise monotone maps of the interval $[0, 1]$. In particular, Ruelle gives a proof of a generalized form of the Baladi-Keller theorem. He also proves a theorem expressing the largest eigenvalue of the transfer operator in terms of the ergodic properties of (M, f, g) .

Ethan AKIN. — **The general topology of dynamical systems.** — Graduate studies in mathematics, vol. 1. — Un vol. relié, 18×26 , de x, 261 p. — Prix : £41.50. — American Mathematical Society, Providence, R.I., distributed by Oxford University Press, Oxford, 1993.

Recent work in dynamical systems theory has both highlighted certain topics in the pre-existing subject of topological dynamics (such as the construction of Lyapunov functions and various notions of stability) and also generated new concepts and results (such as attractors, chain recurrence, and basic sets). This book organizes these results, old and new, into a natural foundation for all aspects of dynamical systems theory.

Jack GRAVER, Brigitte SERVATIUS, Herman SERVATIUS. — **Combinatorial rigidity.** — Un livre relié, 18×26 , de x, 172 p. — Prix : £34.00. — American Mathematical Society, Providence, R.I., distributed by Oxford University Press, Oxford, 1993.

This book presents rigidity theory in a historical context and includes an introduction to matroid theory and an extensive study of planar rigidity. The final chapter is devoted to higher-dimensional rigidity, highlighting the main open questions. Included is an extensive annotated bibliography. This work is accessible to those who have had an introduction to graph theory at the graduate level.

D.V. ANOSOV, A.A. BOLIBRUCH. — **The Riemann-Hilbert problem.** — A publication from the Steklov Institute of Mathematics. — Aspects of mathematics, vol. E 22. — Un vol. relié, $16,5 \times 23$, de IX, 190 p. — Prix : DM 64.00. — Vieweg, Wiesbaden, 1994.

Hilbert's 21st problem deals with linear systems of ordinary differential equations in the complex domain. The question is whether there is a Fuchsian system with prescribed singularities and monodromy. In 1989, A.A. Bolibruch discovered a counterexample, giving a negative answer to the problem. This book treats all known results on the problem. It contains related results on scalar linear ordinary differential equations in the complex domain.

Jean ECALLE. — **Introduction aux fonctions analysables et preuve constructive de la conjecture de Dulac.** — Actualités mathématiques. — Un vol. broché, 17×24 , de 344 p. — Prix : FF 220.00. — Hermann, Paris, 1992.

Ce livre s'articule autour de trois objectifs : donner une preuve conceptuelle et transparente de la conjecture de Dulac, illustrer à ce propos de nouvelles et très performantes méthodes de resommation, introduire la notion de fonction analysable, qui marque en un sens l'ultime extension de la notion de fonction localement formalisable. L'auteur fait intervenir des notions de calcul étranger, accélération, sommation médiane et surtout de transsérie.

B. CANDELPERGHER, J.C. NOSMAS, F. PHAM. — **Approche de la résurgence.** — Actualités mathématiques. — Un vol. broché, 17×24 , de 296 p. — Prix : FF 210.00. — Hermann, Paris, 1993.

Ce livre constitue une introduction élémentaire aux notions de base de la théorie de la résurgence. Développée à partir de 1975 par Jean Ecalle, la théorie des fonctions résurgentes s'applique à de nombreux sujets de mathématique et de physique théorique où interviennent les séries divergentes. Elle fournit un outil algébrique, le calcul étranger, qui permet d'analyser et de maîtriser les ambiguïtés du procédé de sommation de Borel.

Modeling techniques for uncertain systems. — Proceedings of a Conference held in Sopron, Hungary, July 1992. — Alexander B. Kurzhanski, Vladimir M. Veliov, editors. — Progress in systems and control theory, vol. 18. — Un vol. relié, $16 \times 24,5$, de xi, 288 p. — Prix : SFr. 158.00. — Birkhäuser, Boston, 1994.

The main aim of the conference was to give an overview of a variety of traditional and recent approaches to the problems of systems identification, estimation, and control in the presence of uncertainty. The papers are divided into three parts: identification, estimation and control. Each contribution attempts to cover methodological issues, new problems, approaches, theoretical results and numerical techniques.

Fabrice BETHUEL, Haïm BREZIS, Frédéric HELEIN. — **Ginzburg-Landau vortices.** — Progress in nonlinear differential equations and their applications, vol. 13. — Un vol. relié, 16×24 , de xxvii, 158 p. — Prix : SFr. 88.00. — Birkhäuser, Boston, 1994.

This book is concerned with the study in two dimensions of stationary solutions of complex valued Ginzburg-Landau equation involving a small parameter E . Such problems are related to questions occurring in physics: e.g., phase transition phenomena in superconductors and superfluids. The parameter E has a dimension of length, which is usually small. Thus, it is of great interest to study the asymptotics as E tends to zero.

Michael ASCHBACHER. — **Sporadic groups.** — Cambridge tracts in mathematics, vol. 104. — Un vol. relié, $16 \times 23,5$, de xii, 314 p. — Prix : £35.00. — Cambridge University Press, Cambridge, 1994.

The classification of the finite simple groups demonstrates that each finite simple group is either a finite analogue of a simple Lie group or one of 26 pathological sporadic groups. The book provides for a self-contained treatment of foundations of the theory of sporadic groups accessible to mathematicians with basic background in finite groups.

Roger V. JEAN. — **Phyllotaxis: a systemic study in plant morphogenesis.** — Un vol. relié, $15,5 \times 23,5$, de xiii, 386 p. — Prix : £45.00. — Cambridge University Press, Cambridge, 1994.

In this book, the many facets of phyllotaxis are dealt with in an integrated manner. The author describes a unified concept of phyllotaxis based on experimental, anatomical, cellular,

physiological, and paleontological observations. The book provides a framework for formal analyses of botanical data, and emphasizes the relevance of the phyllotactic paradigm in the study of other structures, such as crystals and proteins.

Ed. PACKEL, Stan WAGON. — **Animating calculus: Mathematica notebooks for the laboratory.** — Un vol. broché, $18,5 \times 23,5$ de XII, 289 p. — Prix : £11.95. — W.H. Freeman, Oxford, 1994.

The book contains twenty-two laboratory notebooks that use Mathematica. With its superior animation and graphics, and coverage ranging from standard topics to new and unusual extensions and applications, this book is a remarkable tool for experiencing calculus on the computer.

Eli MAOR. — **e: the story of a number.** — Un vol. relié, $16 \times 24,5$, de XIV, 223 p. — Prix : US\$ 24.95. — Princeton University Press, Princeton, 1994.

This book is a history of e , from a human as well as a mathematical perspective, the story from the early seventeenth to the late nineteenth century, with the invention of calculus at its center. The unifying theme in this book is how a single number ties together many different aspects of mathematics - from the law of compound interest to the shape of a hanging chain, from the area under a hyperbola to Euler's famous formula, from the inner structure of a nautilus shell to Bach's equal-tempered scale.

Helmut WIELANDT. — **Mathematische Werke/Mathematical Works, vol. 1: Group theory.** — Edited by Bertram Huppert and Hans Schneider. — Un vol. relié, $17 \times 24,5$, de XIX, 802 p. — Prix : DM 348.00. — Walter de Gruyter, Berlin, 1994.

Band 1 der gesammelten Werke enthält sämtliche gruppentheoretischen Arbeiten sowie ausgewählte Vorlesungen, die der Mathematiker an Universitäten in Deutschland und den USA gehalten hat. Ebenfalls aufgenommen wurde der seit einiger Zeit vergriffene Klassiker „Finite Permutation Groups“. Contents: Permutation groups. Subnormality. Factorised groups. π -Structure of finite groups. Near rings. Miscellanea.

Howard ANTON. — **Elementary linear algebra.** — Seventh edition. — Un vol. relié, $19,5 \times 24$, de XVI, 570, 47 p. — Prix : £60.00. — John Wiley & Sons, New York, 1994.

Systems of linear equations and matrices. — Determinants. — Vectors in 2-space and 3-space. — Euclidean vector spaces. — General vector spaces. — Inner product spaces. — Eigenvalues, eigenvectors. — Linear transformations. — Additional topics. — Complex vector spaces. — Answers to exercises.

Stephan FOLDES. — **Fundamental structures of algebra and discrete mathematics.** — A Wiley-Interscience publication. — Un vol. relié, 16×24 , de XV, 344 p. — Prix : £54.00. — John Wiley & Sons, New York, 1994.

The book is an introduction to the twelve basic kinds of structures - sets, groups, rings, fields, vector spaces, graphs, lattices, matroids, topological spaces, universal algebras, and categories - that underlie algebra and discrete mathematics. The book examines selected key aspects of these structures, including: closure systems, generators, substructures, homomorphisms and congruences, etc.

Neville D. FOWKES and John J. MAHONY. — **An introduction to mathematical modelling.** — Un vol. broché, 15×23 , de XVI, 447 p. — Prix : £32.00. — John Wiley & Sons, Chichester, 1994.

The contents of this book attempt to develop material for use in a models course within the framework of a relatively confined non-mathematical knowledge base. The material relates to modelling questions which are seen to be of current practical interest and to introduce mathematical techniques which are efficient, practical and frequently used.

Bernard SARAMITO. — **Stabilité d'un plasma : modélisation mathématique et simulation numérique.** — Recherches en mathématiques appliquées, vol. 34. — Un vol. broché, 16×24 , de XIV, 258 p. — Prix : FF 260.00. — Masson, Paris, 1994.

Ce livre étudie mathématiquement et numériquement certains des principaux types d'instabilité de l'état d'équilibre d'un plasma décrit par les équations de la magnétohydrodynamique (MHD), c'est-à-dire lorsque l'on considère le plasma comme un fluide compressible en interaction avec un champ magnétique.

Algebraic geometry and its applications. — Proceedings of the 8th Algebraic Geometry Conference, Yaroslavl' 1992. — A publication from the Steklov Institute of Mathematics. — Edited by Alexander Tikhomirov, Andrej Tyurin. — Aspects of mathematics, vol. E 25. — Un vol. relié, $16,5 \times 23$, de XI, 251 p. — Prix : DM 88.00. — Vieweg, Braunschweig/Wiesbaden, 1994.

The volume contains the lectures on modern directions in algebraic geometry, such as the theory of exceptional bundles and helices on algebraic varieties, moduli of vector bundles on algebraic surfaces with applications to Donaldson's theory, geometry of Hilbert schemes of points, twistor spaces and applications to string theory, etc.

Wolfgang EBELING. — **Lattices and codes: a course partially based on lectures by F. Hirzebruch.** — Advanced lectures in mathematics. — Un vol. broché, 16×23 , de XVI, 178 p. — Prix : DM 48.00. — Vieweg, Braunschweig/Wiesbaden, 1994.

The problems which are interesting for the design of the error-correcting codes turn out to be closely related to problems studied partly earlier and independently in pure mathematics. In this book, examples of such connections are presented. The relation between lattices studied in number theory and geometry and error-correcting codes is discussed.

Owe AXELSSON. — **Iterative solution methods.** — Un vol. relié, 16×24 , de XIII, 654 p. — Prix : £50.00. — Cambridge University Press, Cambridge, 1994.

The book deals primarily with the numerical solution of linear systems of equations by iterative methods. The first part of the book is intended to serve as a textbook for a numerical linear algebra course. The second part of the book serves as a monograph introducing recent results in the iterative solution of linear systems.

I.R. PORTEOUS. — **Geometric differentiation for the intelligence of curves and surfaces.** — Un vol. relié, $23,5 \times 15,5$, de XIII, 301 p. — Prix : £35.00. — Cambridge University Press, Cambridge, 1994.

Inspired by the work of Thom and Arnol'd on singularity theory, topics such as umbilics, ridges and subparabolic lines, all robust features of a smooth surface, which are rarely treated in elementary courses on differential geometry, are here considered in detail. Central to the exposition is the role of certain cubic forms associated with a surface.

Alberto ELDUQUE, Hyo Chul MYUNG. — **Mutations of alternative algebras.** — Mathematics and its applications, vol. 278. — Un vol. relié, $16,5 \times 24,5$, de XIII, 226 p. — Prix : Dfl. 175.00. — Kluwer Academic Publishers, Dordrecht, 1994.

This book presents a self-contained treatment of the theory of mutation algebras. The book also deals with a broader class of algebras, mutations of alternative algebras, which are a natural generalization of mutations of associative algebras. A complete structure theory, including automorphisms, derivations and certain representations, is given for mutations of artinian alternative algebras, and, in particular, of Cayley-Dickson algebras.

Rafail KRICHEVSKY. — **Universal compression and retrieval.** — Mathematics and its applications, vol. 274. — Un vol. relié, 16,5×25, de VIII, 219 p. — Prix : Dfl. 155.00. — Kluwer Academic Publishers, Dordrecht, 1994.

This volume constitutes a comprehensive course on source encoding. The information retrieval is incorporated into source coding instead of discussed separately ; this book places an emphasis on the trade-off between complexity and the quality of coding ; i.e. what is the price of achieving a maximum degree of data compression ? A special attention is paid to universal families which contain a good compressing map for every source in a set.

ICPT '91. — Proceedings from the International Conference on Potential Theory, Amersfoort, the Netherlands, August 18-24, 1991. — Edited by Emile Bertin. — Un vol. relié, 16,5×25, de XIII, 291 p. — Prix : Dfl. 245.00. — Kluwer Academic Publishers, Dordrecht, 1994.

The volume consists of two parts, the first of which contains papers which also appeared in the special issue of POTENTIAL ANALYSIS. The second part includes a collection of contributions edited and partly produced in Utrecht. Professor Monna wrote a preface reminiscing about his experiences with potential theory, mathematics and mathematicians during the last six years.

Karel REKTORYS. — **Survey of applicable mathematics.** — Second revised edition. — Mathematics and its applications, vol. 280-281. — Deux vol. reliés, 16,5×24,5, de XXXIV, 781 p. et XXVI, 942 p. — Prix : Dfl. 845.00. — Kluwer Academic Publishers, Dordrecht, 1994.

This second extensively revised edition covers all the important mathematical fields of use in applications : algebra, geometry, differential and integral calculus, infinite series, orthogonal systems of functions, Fourier series, special functions, ordinary differential equations, partial differential equations, integral equations, functions of one and several complex variables, conformal mapping, integral transforms, functional analysis, numerical methods in algebra and in differential boundary value problems, probability, statistics, stochastic processes, calculus of variations and programming. Each of the two volumes contains an extensive bibliography and a comprehensive index.

Peter TEBBUTT. — **Basic mathematics for chemists.** — Un vol. broché, 19×24,5, de XII, 244 p. — Prix : £ 15.95. — John Wiley, Chichester, 1994.

The book provides : — A non-technical approach to important mathematical concepts used in chemistry. — A solid grounding in the basic mathematics. — An introduction to topics such as calculus, logarithms and manipulation of equations. — Examples from first-year chemistry courses with relevance to real chemistry problems. — An essential learning and teaching tool for introductory courses in the chemical sciences.

Walter BENZ. — **Real geometries.** — Un vol. relié, 17×25, de 379 p. — Prix : DM 78.00. — BI Wissenschaftsverlag, Mannheim, 1994.

The theorem of June Lester, the theorem of Wen-ling Huang and others are proved in this book which is devoted to a modern and systematic treatment of many geometries which were developed since the end of the 18th century. Also Einstein's cylinder universe and de Sitter's world are included as special real geometries.

Bernard DWORK, Giovanni GEROTTO and Francis J. SULLIVAN. — **An introduction to G -functions.** — Annals of mathematics studies, vol. 133. — Un vol. broché, $15,5 \times 23,5$, de XXI, 323 p. — Prix : US\$ 29.95. — Princeton University Press, Princeton, 1994.

This book is based upon a course given with the collaboration of G. Gerotto and F.J. Sullivan during the academic year 1992/93 at the University of Padova. The plan was to present completely the p -adic foundations of the basic properties of G -functions, assuming only a basic knowledge of algebra. A complete proof of the main result is given : the analytic continuation of a G -series is again a G -series.

Motion by mean curvature and related topics. — Proceedings of the international conference held at Trento, July 20-24, 1992. — Edited by Giuseppe Buttazzo and Augusto Visintin. — Un vol. relié, $17,5 \times 24,5$, de VIII, 219 p. Prix : DM 198.00. — Walter de Gruyter, Berlin, 1994.

This volume consists of original contributions from participants at an international conference on surface tension and movement by mean curvature. The key notion is motion by mean curvature, which means the evolution of a surface which moves with velocity pointwise proportional to its mean curvature.

Elwyn BERLEKAMP, David WOLFE. — **Mathematical Go: chilling gets the last point.** — Un vol. relié, de $16 \times 24,5$, de XX, 234 p. — Prix : US\$ 29.95. — A.K. Peters, Wellesley MA, 1994.

The authors develop the mathematical techniques for solving late-stage endgame problems that can stump top-ranking professionals. Combinatorial game theory is applied to solving Go-related problems with a bewildering choice of similar-looking moves and subtle priority relationships.

W.V.D. HODGE, D. PEDOE. — **Methods of algebraic geometry, vol. 1.** — Cambridge mathematical library. — Un vol. broché, 15×23 , de VIII, 440 p. — Prix : £ 14.95. — Cambridge University Press, Cambridge, 1994.

This work (together three volumes) provides a lucid and rigorous account of the foundations of modern algebraic geometry. This first volume is divided into two parts. The first is devoted to pure algebra : the basic notions, the theory of matrices over a non-commutative ground field... The second part is concerned with the definitions and basic properties of projective space in n dimensions.

Roy L. CROLE. — **Categories for types.** — Cambridge mathematical textbooks. — Un vol. broché, 15×23 , de XVII, 335 p. — Prix : £ 14.95. — Cambridge University Press, Cambridge, 1993.

This book explains the basic principles of categorical type theory and illustrates some of the techniques used to derive categorical semantics for specific type theories. It introduces the reader to ordered set theory, lattices and domains, and this material provides plenty of examples for an introduction to category theory. Categories, functors, natural transformations and more are covered.

Geometry and global analysis. — Report of the first MSJ International Research Institute, July 12-23, 1993, Tohoku University, Sendai, Japan. — Edited by Takeshi Kotake, Seiki Nishikawa, Richard Schoen. — Un vol. broché, 18×25,5, de 500 p. — Tôhoku University, Mathematical Institute, Sendai, 1994.

The main topics of this conference were geometric variational problems such as harmonic maps and minimal surfaces, gauge theory and its applications, and complex differential geometry. This volume contains extended or corrected versions of the lectures delivered at the conference, which were contributed at the request of the organizing committee.

Maurice KENDALL, J. Keith ORD. — **Time series.** — 3rd edition. — Un vol. broché, 15,5×23,5, de x, 296 p. — Prix : £16.95. — Edward Arnold, London, 1993.

Key features include : discussion of ARIMA and structural approaches to model building, discussion of spectral methods, an introduction to multiple time series and new sections on traditional forecasting procedures; comparative evaluations; and automatic model selection procedures, inclusion of worked examples using real and simulated data.

Brian S. EVERITT. — **Cluster analysis.** — 3rd edition. — Un vol. relié, 16×24, de VIII, 170 p. — Prix : £26.50. — Edward Arnold, London, 1993.

Cluster analysis is the generic name for a wide variety of procedures involved with identifying groups within data. The text includes : information on the available software packages, helpful suggestions for applying clustering techniques or evaluating results, detailed descriptions of recent methods along with numerous examples.

Benny EVANS, Jerry JOHNSON. — **Linear algebra with DERIVE.** — Un vol. broché, 21×25,5, de x, 280 p. — Prix : £16.50. — J. Wiley, New York, 1994.

This book is an enrichment supplement to a traditional introductory linear algebra course. Its purpose is to help students use the DERIVE R program as a tool to solve problems that arise in such a course. This book adds a new dimension to the conventional linear algebra class by providing problems that go beyond the level of rote calculations and template exercises.

Environment, economics and their mathematical models. — Edited by J.I. Diaz, J.-L. Lions. — Research in applied mathematics. — Un vol. broché, 16×24, de 191 p. — Prix : FF 190.00. — Masson, Paris, 1994.

The texts correspond to extended versions of lectures presented by the authors in the Curso de Verano de la Universidad Complutense de Madrid (Almeria, June 26 to July 3, 1992). Following the first volume of this series, this book presents some new results on the modelling and mathematical treatment of problems of environment. Moreover it contains contributions devoted to the economics of the environment.

Alan STUART, J. Keith ORD. — **Kendall's advanced theory of statistics, vol. 1: Distribution theory.** — Sixth edition. — Un vol. relié, 17,5×25, de xx, 676 p. — Prix : £65.00. — Edward Arnold, London, 1994.

It is fifty years since the first edition of Maurice Kendall's Volume 1 appeared so it is fitting that a new edition sees a major restructuring of the Advanced Theory. This volume contains a new chapter (7) providing a unified treatment of bivariate and multivariate distributions. Chapter 16 has been enlarged to cover multivariate sampling theory.

Anthony O'HAGAN. — **Kendall's advanced theory of statistics, vol. 2B: Bayesian inference.** — Un vol. relié, 17,5×25, de XII, 330 p. — Prix : £35.00. — Edward Arnold, London, 1994.

With this addition to the other two volumes, Kendall's Advanced Theory of Statistics can claim still to fulfil Kendall's original intention, fifty years ago, "to develop a systematic treatment of statistical theory as it exists at the present time". This book meets the growing need for a comprehensive treatment of modern Bayesian theory in readable form.

W.J. KRZANOWSKI, F.H.C. MARRIOTT. — **Multivariate analysis, part 1: Distributions, ordination and inference.** — Kendall's library of statistics, vol. 1. — Un vol. relié, 16×24, de IX, 280 p. — Prix : £29.95. — Edward Arnold, London, 1994.

This first volume of a two part work on multivariate analysis concentrates on what might be termed the 'basic' techniques: topics covered range from initial inspection and graphical display of multivariate data through informal data-based methods such as principal components, canonical variates and multi-dimensional scaling, to inferential procedures such as two-sample hypothesis tests and the multivariate general model.

W.V.D. HODGE, D. PEDOE. — **Methods of algebraic geometry, vol. 3, book V: Birational geometry.** — Cambridge mathematical library. — Un vol. broché, 16×23, de X, 336 p. — Prix : £14.95. — Cambridge University Press, Cambridge, 1994.

In this third volume, the authors confine their attention to varieties defined on a ground field without characteristic. In order to familiarise the reader with different techniques available, they have not restricted themselves to one method, and frequently use more advanced methods where more elementary ones would serve, when by doing so it has been possible to demonstrate the power of the more advanced techniques.

J. David LOGAN. — **An introduction to nonlinear partial differential equations.** — Pure and applied mathematics. — A Wiley-Interscience Publication. — Un vol. relié, 24×17, de XI, 395 p. — Prix : £52.00. — John Wiley & Sons, New York, 1994.

The book provides students with a fundamental, working knowledge of the nature and application of nonlinear PDEs, striking a balance between the mathematical and physical aspects of the subject. Packed with numerous references and exercises this textbook goes on to cover such applied areas as biology, chemistry, combustion, detonation, traffic flow, and heat transfer.

John MILNOR. — **Collected papers, vol. 1: Geometry.** — Un vol. relié, 17×24, de X, 295 p. — Prix : US\$20.00. — Publish or Perish, York PA, 1994.

Differential geometry and curvature. — Algebraic geometry and topology. — Euclidean and non-Euclidean geometry. The volume includes four papers which have not previously been published.

Recent advances in partial differential equations. — Edited by M.A. Herrero and E. Zuazua. — Research in applied mathematics. — Un vol. broché, 16×24, de 150 p. — Prix : FF 165.00. — Masson, Paris, 1994.

In this volume an updated survey of some active research fields in contemporary PDE's is given. Topics include evolution of hypersurfaces by mean curvature flow, nonlinear wave equations including harmonic maps, and blow up mechanisms for semilinear parabolic equations. Attention is also paid to well established physical models.

B. AEBISCHER, M. BORER, M. KÄLIN, Ch. LEUENBERGER, H.M. REIMANN. — **Symplectic geometry: an introduction based on the Seminar in Bern, 1992.** — Progress in mathematics, vol. 124. — Un vol. relié, 16×24, de XII, 235 p. — Prix : SFr. 68.00. — Birkhäuser Verlag, Basel, 1994.

The present volume is intended as a first reading in symplectic geometry. Basic notions are explained and the principal examples are outlined. Capacities, generating functions, Floer homology, pseudoholomorphic curves and contact structures make up the core of the exposition. To a large extent the treatment is self-contained, and detailed references to the current literature facilitate the access to the original papers.

Bert-Wolfgang SCHULZE. — **Pseudo-differential boundary value problems, conical singularities and asymptotics.** — Mathematical topics, vol. 4. — Un vol. relié, 18×25, de 580 p. — Prix : DM 160.00. — Akademie Verlag, Berlin, 1994.

In the monograph, the theory of pseudo-differential boundary value problems under the aspect of a calculus for conical singularities is studied. The theory contains essential ideas for treating the more general case of pseudo-differential operators on manifolds with edges and applies to a wide range of classical transmission and mixed problems, and gives a description of parametrices on a complete symbolic level.

Sergey A. NAZAROV, Boris A. PLAMENEVSKY. — **Elliptic problems in domains with piecewise smooth boundaries.** — De Gruyter expositions in mathematics, vol. 13. — Un vol. relié, 18×24, de VII, 524 p. — Prix : DM 278.00. — Walter de Gruyter, Berlin, 1994.

This monograph is devoted to general elliptic boundary value problems in domains with boundaries containing conical points and edges of different dimensions. The main concern is the solvability of such problems and the existence of asymptotic formulas for solutions near singularities. Applications to the mechanics of solids, fluid dynamics and elasticity theory are discussed.

Colin C. ADAMS. — **The knot book: an elementary introduction to the mathematical theory of knots.** — Un vol. relié, 16×24, de XIII, 306 p. — Prix : £23.95. — W.H. Freeman and Company, New York, 1994.

Starting with the simplest knot, the author guides readers through increasingly more intricate twists and turns of knot theory, exploring problems and theorems mathematicians now can solve, as well as those that remain open. He also looks at how knot theory is providing important insights in biology, chemistry, physics, and other fields. Included are hundreds of illustrations of knots as well as worked examples, exercises, open problems.

R.F. HOSKINS, J. SOUSA PINTO. — **Distributions, ultradistributions and other generalized functions.** — Mathematics and its applications. — Un vol. relié, 18×24, de XI, 300 p. — Prix : US\$60.00. — Ellis Horwood, New York, 1994.

This book evaluates various approaches to the theory of distributions which have appeared since the presentation by Laurent Schwartz in the 1950's. The authors give an account of ultradistributions and of Sato hyperfunctions, and discuss some of the problems posed by the definition of so-called 'irregular operations' on generalised functions. They include an introduction to the new generalised functions of Colombeau.

Analyse algébrique des perturbations singulières, vol. 1: Méthodes résurgentes. — Sous la direction de Louis Boutet de Monvel. — Collection Travaux en cours, vol. 47. — Un vol. broché, 17×24, de 134 p. — Prix: FF 180.00. — Hermann, Paris, 1994.

Le thème des conférences du symposium franco-japonais sur l'analyse algébrique des perturbations singulières (CIRM, 20-26 octobre 1991), publiées en deux volumes, était l'utilisation de la théorie de la résurgence et de la ressommation dans l'étude des équations différentielles et aux dérivés partielles. Ce premier volume regroupe les exposés qui relèvent des fondements des méthodes résurgentes, ou les utilisent de façon fondamentale pour décrire un phénomène physique ou mathématique.

Analyse algébrique des perturbations singulières, vol. 2: Méthodes différentielles. — Sous la direction de Louis Boutet de Monvel. — Collection Travaux en cours, vol. 48. — Un vol. broché, 17×24, de 133 p. — Prix: FF 180.00. — Hermann, Paris, 1994.

Ce deuxième volume regroupant les exposés du symposium franco-japonais sur l'analyse algébrique des perturbations singulières (CIRM, 20-26 octobre 1991), traite des thèmes suivants: fondements physiques, théorie des D-modules holonômes, asymptotique semi-classique, équations hyperboliques et prolongement dans le domaine complexe de leurs solutions.

Gennady SAMORODNITSKY, Murad S. TAQQU. — **Stable non-Gaussian random processes: stochastic models with infinite variance.** — Stochastic modeling. — Un vol. relié, 16,5×24,5, de XVI, 632 p. — Prix: £49.50. — Chapman & Hall, New York London, 1994.

Stable random variables on the real line. Multivariate stable distributions. Stable random processes and stochastic integrals. Dependence structures of multivariate stable distributions. Non-linear regression. Complex stable stochastic integrals and harmonizable processes. Self-similar processes. Chentsov random fields. Introduction to sample path properties. Boundedness, continuity and oscillations. Mesurability, integrability and absolute continuity. Boundedness and continuity via metric entropy. Integral representation. Historical notes and extension.

K.-T. FANG, Y. WANG. — **Number-theoretic methods in statistics.** — Monographs on statistics and applied probability, vol. 51. — Un vol. relié, 14,5×23, de XII, 340 p. — Prix: £29.95. — Chapman & Hall, London, 1994.

The application of number-theoretic methods is a new branch of statistics. In applying the Monte Carlo method, the use of 'pseudo' random numbers often leads to large errors. The number-theoretic methods described in this book reduce such errors by using number theory to find a set of points representative of a given distribution.

P.J. GREEN, B.W. SILVERMAN. — **Nonparametric regression and generalized linear models: a roughness penalty approach.** — Monographs on statistics and applied probability, vol. 58. — Un vol. relié, 14,5×23, de IX, 181 p. — Prix: £24.99. — Chapman & Hall, London, 1994.

This monograph concentrates on the roughness penalty method with the aim of showing how it provides a unifying approach to a wide range of smoothing problems. The method allows parametric assumptions to be relaxed both in regression problems and in those approached by generalized linear modelling. The mathematical treatment is intended to be largely self-contained.

Combinatorics, Paul Erdős is eighty, vol. 1. — Edited by D. Miklós, V.T. Sós, T. Szönyi. — Bolyai Society mathematical studies, vol. 1. — Un vol. relié, 18×25, de 527 p. — Prix : US\$100.00. — János Bolyai Mathematical Society, Budapest, 1993.

With this volume the János Bolyai Mathematical Society has launched a new mathematical series aimed to be a sort of continuation of the terminating old series "Colloquia Mathematica Societatis János Bolyai". This volume was published in time for the International Combinatorics Colloquium, Keszthely, Hungary. It contains 26 invited research/survey articles, and the most complete list of publications of Paul Erdős (1272 items).

Ronald L. GRAHAM, Donald E. KNUTH, Oren PATASHNIK. — **Concrete mathematics: a foundation for computer science.** — Second edition. — Un vol. relié, 20×24, de XIII, 657 p. — Prix : US\$41.50. — Addison-Wesley Publishing Company, Reading, Mass., 1994.

The aim of the authors is to provide a solid and relevant base of mathematical skills. This text is useful not only for computer scientists but for practitioners of mathematics in virtually every discipline. This is a blending of CONTinuous and disCRETE mathematics. This second edition includes new material about mechanical summation. Bibliography and indexes have been expanded.

Leslie LAMPORT. — **LATEX: a document preparation system: user's guide and reference manual.** — Second edition. — Un vol. broché, 19×23,5, de xvi, 272 p. — Prix : US\$44.95. — Addison-Wesley Publishing Company, Reading, Mass., 1994.

This book has been updated to reflect the changes in the new release (LATEX2) of this now well known software, and includes descriptions of new commands for inserting pictures prepared with other programs and for producing colored output, new sections on how to make books and slides, instructions for making an index with the Makeindex program, and an updated guide to preparing a bibliography with the BIBTEX program, a section on how to send your LATEX documents electronically.

P. LASCAUX, R. THEODOR. — **Analyse numérique matricielle appliquée à l'art de l'ingénieur, tome 2: Méthodes itératives.** — 2^e édition. — Un vol. broché, 16×24, de xxv, 636 p. — Prix : FF 280.00. — Masson, Paris, 1994.

Cet ouvrage contient un exposé des méthodes depuis les plus classiques (élimination de Gauss, surrelaxation, puissance itérée, QR...) et leurs extensions (matrices creuses, itérations de sous-espaces...) jusqu'aux plus récentes (gradient conjugué préconditionné, multigrille, Lanczos...). Les aspects de l'évaluation pratique des algorithmes sont également présentés.

D. EUVRARD. — **Résolution numérique des équations aux dérivées partielles de la physique, de la mécanique et des sciences de l'ingénieur: différences finies, éléments finis, problèmes en domaine non borné.** — 3^e édition. — Enseignement de la physique. — Un vol. broché, 16×24, de xiv, 329 p. — Prix : FF 182.00. — Masson, Paris, 1994.

Ce livre propose à la fois un enseignement de culture générale sur les principales équations de la physique et de la mécanique (équation de Laplace, de la chaleur, des cordes vibrantes, de Bürger, de Navier-Stokes) et un ensemble de techniques numériques pour les discrétiser et les résoudre. Cette 3^e édition, refondue, présente en sus des problèmes de propagation d'ondes.

Gregory KARPILOVSKY. — **Group representations, vol. 3.** — North-Holland mathematics studies, vol. 180. — Un vol. relié, 17,5×24,5, de xv, 907 p. — Prix : Dfl. 375.00. — North-Holland, Amsterdam, 1994.

The first part of this volume is devoted to the investigation of various properties of projective characters. Special attention is drawn to spin representations and their character tables and to various correspondences for projective characters. The second part is devoted to Clifford theory for graded algebras and its application to the corresponding theory for group algebras. The volume ends with a detailed investigation of the Schur index for ordinary representations.

Advances in optimization and numerical analysis: proceedings of the sixth Workshop on Optimization and Numerical Analysis, Oaxaca, Mexico. — Edited by Susana Gomez and Jean-Piere Hennart. — Mathematics and its applications, vol. 275. — Un vol. relié, 16,5×25, de vii, 285 p. — Prix : Dfl. 175.00. — Kluwer Academic Publishers, Dordrecht, 1994.

The participation of leading personalities resulted in this state-of-the-art volume on continuous optimization. The papers presented give an overview of such topics as interior point and simplex methods for linear programming problems, new methods for nonlinear programming, results in non-convex linear complementarity problems and non-smooth optimization. Several articles deal with the numerical solution of diffusion-advection equations.

Stanislaw SIENIUTYCZ. — **Conservation laws in variational thermo-hydrodynamics.** — Mathematics and its applications. — Un vol. relié, 16,5×24,5, de xxiii, 448 p. — Prix : Dfl. 295.00. — Kluwer Academic Publishers, Dordrecht, 1994.

This volume presents an original, synthesizing approach to the thermal physics of fluid continua based on a novel extension of Hamilton's principle which allows the free flow of entropy, independent from that of matter. The extension, used in the context of Noether's theorem of variational calculus, gives rise to heat and diffusion terms in the conservation laws for the energy, momentum and matter, and may include the effects of thermal inertia.

Nonlinear partial differential equations and their applications, Collège de France Seminar, vol. 12. — Edited by H. Brezis and J.L. Lions. — Pitman research notes in mathematics series, vol. 302. — Un vol. broché, 17×24,5, de 235 p. — Prix : £28.00. — Longman Scientific and Technical, Harlow, Essex, 1994.

The emphasis is laid on applications including control theory, theoretical physics, fluid and continuum mechanics, free boundary problems, dynamical systems, scientific computing, numerical analysis and engineering. — Contents : 16 papers by G. Allaire, C. Bardos, G. Bouchitte and P. Suquet, A. Capietto, J. Mawhin and F. Zanolin, J.-M. Delort, P. Gerard, P. Grisvard, K. Hamdache, A. Haraux, S.M. Kozlov, M. Lanza de Cristoforis and S.S. Antman, P.A. Raviart, E. Sanchez-Palencia, D. Serre, S. Solimini, D.W. Stroock.

M.I. ZELIKIN, V.F. BORISOV. — **Theory of chattering control: with applications to astronautics, robotics, economics, and engineering.** — Systems and control. — Un vol. relié, 16×24,5, de xiv, 242 p. — Prix : SFr. 138.00. — Birkhäuser, Boston, 1994.

This book presents the first systematic treatment of fields of optimal trajectories with an infinite number of switches on a finite time interval. A method of resolution of singularities of the first return Poincaré mapping for discontinuous Hamiltonian systems allows the solution of problems with Fuller's phenomenon which defy the usual methods. Lagrangian manifolds and optimal syntheses including extremals with an infinite number of switches are designed.

Mathematical modelling and simulation of electrical circuits and semiconductor devices. — Proceedings of a conference held at the Mathematisches Forschungsinstitut,

Oberwolfach, July 5-11, 1992. — Edited by R.E. Bank, R. Burlisch, H. Gajewski, K. Merten. — International series of numerical mathematics, vol. 117. — Un vol. relié, $17,5 \times 24$, de xiv, 313 p. — Prix : SFr. 118.00. — Birkhäuser, Basel, 1994.

This book collects the contributions of the 2nd Oberwolfach conference on this subject. They cover electric circuit simulation, device simulation and process simulation. Discussions on experiences with standard software packages and improvements of such packages are included. New modelling approaches, numerical techniques, existence and uniqueness results are given in the semiconductor area.

J.E. LAGNESE, G. LEUGERING, E.J.P.G. SCHMIDT. — **Modeling, analysis and control of dynamic elastic multi-link structures.** — Systems and control. — Un vol. relié, $16 \times 24,5$, de xv, 388 p. — Prix : SFr. 148.00. — Birkhäuser, Boston, 1994.

The purposes of this monograph are : — To derive distributed parameter models of the transient behavior of some or all of the state and interval variables which describe the dynamic response of multiple-link flexible structures such as trusses, robot arms... etc. — To provide rigorous mathematical analysis of the resulting models. — To develop control theoretic properties of multiple-link flexible structures.

Multigrid methods IV. — Proceedings of the fourth European Multigrid Conference, Amsterdam, July 6-9, 1993. — Edited by P.W. Hemker, P. Wesseling. — International series of numerical mathematics, vol. 116. — Un vol. relié, $17,5 \times 24$, de viii, 358 p. — Prix : SFr. 128.00. — Birkhäuser, Basel, 1994.

Most prominent among new issues are parallel computing and adaptive computations. Multigrid methods also have considerable impact on computational fluid dynamics. This influence is reflected in the present, carefully screened selection of contributions presented at the Amsterdam conference, all of which reflect the latest developments in this field.

Development of mathematics, 1900-1950. — Edited by Jean-Paul Pier. — Un vol. relié, 17×24 , de xvii, 729 p. — Prix : SFr. 98.00. — Birkhäuser, Basel, 1994.

An exacting chronology marks key events in the development of mathematics, and a rich range of topics are addressed by some of the most eminent mathematicians. Contributors include J.L. Doob, G. Fichera, M. Guillaume, W. Hayman, C. Houzel, J.-P. Kahane, A. Lichnerowicz, J. Mawhin, L. Nirenberg, J.-P. Pier, W. Schwarz, and an extensive article by the late J. Dieudonné sets down a history of topology. A list of primary sources adds to the book's value as a reference volume.

Nicolai N. VOROB'EV. — **Foundations of game theory: noncooperative games.** — Translated from the Russian by Ralph P. Boas. — Un vol. relié, $17,5 \times 24$, de x, 496 p. — Prix : SFr. 198.00. — Birkhäuser, Basel, 1994.

The book contains results on the theory of equilibrium points in noncooperative games with numerical pay-offs that are considered as the basic class of games. The introduction contains a detailed explanation of the fundamental methodological questions of game theory, including the general problems of optimality. The book's four chapters cover the problems of the general theory of noncooperative games, finite noncooperative games, the general theory of two-person zero-sum games, and matrix games.

Toeplitz operators and related topics: the Harold Widom anniversary volume. — Workshop on Toeplitz and Wiener-Hopf Operators, Santa Cruz, California, September 20-22, 1992. — Edited by E.L. Basor, I. Gohberg. — Operator theory, vol. 71. — Un vol. relié, 17×24 , de xix, 186 p. — Prix : SFr. 88.00. — Birkhäuser Verlag, Basel, 1994.

This is a selection of papers containing some recent achievements in the following areas: Szegő-Widom asymptotic formulas for determinants of finite sections of Toeplitz matrices and their generalizations, the Fisher-Hartwig conjecture, random matrices, analysis of kernels of Toeplitz matrices, projectional methods and eigenvalue distribution for Toeplitz matrices, Fredholm theory for convolution type operators, the Nehari interpolation problem, and Toeplitz-Hausdorff type theorems.

Michael FALK, Jürg HÜSLER, Rolf-Dieter REISS. — **Laws of small numbers: extremes and events.** — DMV Seminar, Bd. 23. — Un vol. broché, 17×24 , de XI, 282 p., disquette incluse. — Prix : SFr. 68.00. — Birkhäuser Verlag, Basel, 1994.

A point process of rare events can be approximated by a Poisson process. This approach is applied to the following topics : extremes and rare events of stochastic processes, Poisson point processes, statistics in extreme value models, and nonparametric regression analysis. This book comes with the statistical software system XTREMES, version 1.2.

Alexander LUBOTZKY. — **Discrete groups, expanding graphs and invariant measures.** — Appendix by Jonathan D. Rogawski. — Progress in mathematics, vol. 125. — Un vol. relié, $16,5 \times 24$, de VII, 195 p. — Prix : SFr. 68.00. — Birkhäuser Verlag, Basel, 1994.

The book presents the solution to the two problems : the first is the construction of expanding graphs - graphs which are of fundamental importance for communication networks and computer science, the second is the Ruziewicz problem concerning the finitely additive invariant measures on spheres. Both problems were partially solved using the Kazhdan property (T) from representation theory of semi-simple Lie groups.

Singularities: Lille 1991. — Edited by Jean-Paul Brasselet. — London Mathematical Society lecture note series. — Un vol. broché, 15×23 , de XVI, 419 p. — Prix : £25.00. — Cambridge University Press, Cambridge, 1994.

Singularity theory encompasses many different aspects of geometry and topology, and an overview of these is represented here. Contributors to this volume include G. Barthel, J.W. Bruce, F. Delgado, M. Ferrarotti, G.M. Greuel, J.P. Henry, L. Kaup, B. Lichtin, B. Malgrange, D. Mond, L. Narvaez, V. Neto, A.A. Du Plessis, R. Thom and M. Vaquié.

Rudolf LIDL, Harald NIEDERREITER. — **Introduction to finite fields and their applications.** — Revised edition. — Un vol. relié, $15,5 \times 24$, de XI, 416 p. — Prix : £29.95. — Cambridge, Cambridge University Press, 1994.

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

S. STERNBERG. — **Group theory and physics.** — Un vol. relié, $18 \times 25,5$, de XIII, 429 p. — Prix : £50.00. — Cambridge University Press, Cambridge, 1994.

This book, based on courses taught at Harvard University, is an introduction to group theory and its applications in physics. The physical applications are considered as the mathematical theory is developed so that the presentation is cohesive and well-motivated. Many modern topics are dealt with and there is much discussion of the group $SU(n)$ and its representations.

Lars OLSEN. — **Random geometrically graph directed self-similar multifractals.** — Pitman research notes in mathematics series, vol. 307. — Un vol. broché, $17 \times 24,5$, de xv, 245 p. — Prix : £29.00. — Longman Scientific & Technical, Harlow, Essex, 1994.

This volume applies some natural multifractal generalizations of the Hausdorff and packing measures to give a detailed and rigorous analysis of the multifractal structure of random graph directed self-similar measures. It presents the latest research on random multifractals (and the physical thermodynamical interpretation of these results) and a unifying approach to multifractal theory.

Sasun YAKUBOV. — **Completeness of root functions of regular differential operators.** — Pitman monographs and surveys in pure and applied mathematics, vol 71. — Un vol. relié, 16×24 , de 245 p. — Prix : £43.00. — Longman Scientific & Technical, Harlow, Essex, 1994.

This monograph treats systematically the general non self-adjoint case, including all the questions connected with the completeness of elementary solutions of mathematical physics problems. The completeness problem of eigenvectors and associated vectors of unbounded polynomial operator pencils, the coercive solvability and completeness of root functions of boundary value problems for both ordinary and partial differential equations are investigated.

Noncompact Lie groups and some of their applications. — Edited by Elizabeth A. Tanner and Raj Wilson. — NATO ASI Series, Series C. Mathematical and physical sciences, vol. 429. — Un vol. relié, $16,5 \times 24,5$, de xi, 495 p. — Prix : Dfl. 295.00. — Kluwer Academic Publishers, Dordrecht, 1994.

This book contains lectures presented by outstanding mathematicians and mathematical physicists at the NATO Advanced Research Workshop on Noncompact Lie Groups held in San Antonio, Texas in January 1993. It touches almost every important topics in the modern theory of representations of noncompact Lie groups and Lie algebras, Lie supergroups and Lie superalgebras, and quantum groups.

L.A. BOKUT', G.P. KUKIN. — **Algorithmic and combinatorial algebra.** — Mathematics and its applications, vol. 255. — Un vol. relié, $16,5 \times 24,5$, de xvi, 384 p. — Prix : Dfl. 320.00. — Kluwer Academic Publishers, Dordrecht, 1994.

This book deals with applications of the composition (or Diamond) lemma to associative and Lie algebras, to subalgebras of free Lie algebras and free products of Lie algebras, to word problems and embedding theorems in varieties of Lie algebras and groups, to the constructive theory of HNN-extensions and its use in analyzing the word and conjugacy problems in the Novikov-Boone groups.

Roelof W. BRUGGEMAN. — **Families of automorphic forms.** — Monographs in mathematics, vol. 88. — Un vol. relié, 17×24 , de x, 317 p. — Prix : DM 164.00. — Birkhäuser Verlag, Basel, 1994.

This book gives a systematic treatment of real analytic automorphic forms on the upper half plane for general cofinite discrete subgroups. These automorphic forms are allowed to have exponential growth at the cusps and singularities at other points as well. It is shown that the Poincaré series and Eisenstein series occur in families of automorphic forms of this general type. These families are meromorphic in the spectral parameter and the multiplier system jointly.

Matrix and operator valued functions: the Vladimir Petrovich Potapov memorial volume. — Edited by I. Gohberg, L.A. Sakhnovich. — Operator theory: advances and applications, vol. 72. — Un vol. relié, 17×24, de xxviii, 211 p. — Prix : DM 118.00. — Birkhäuser Verlag, Basel, 1994.

This book is dedicated to the memory of an outstanding mathematician and personality, Vladimir Petrovich Potapov. It begins with insightful biographical material, and then presents a collection of papers on different aspects of operator theory and complex analysis covering those recent achievements of the Odessa-Kharkov school in which Potapov was very active. The main topics are the multiplicative structure of contractive matrix and operator functions, operators in spaces with indefinite scalar products...

Victor P. MASLOV. — **The complex WKB method for nonlinear equations I: linear theory.** — Translated from the Russian by M.A. Shishkova and A.B. Sossinsky. — Progress in physics, vol. 16. — Un vol. relié, 16×24, de vii, 300 p. — Prix : DM 198.00. — Birkhäuser Verlag, Basel, 1994.

The present English edition includes new examples of applications to physics, hitherto unpublished or available only in Russian. Its central mathematical idea is to use topological methods to analyse isotropic invariant manifolds in order to obtain asymptotic series of eigenvalues and eigenvectors for the multi-dimensional Schrödinger equation, and also to take into account the so-called tunnel effects.

Günther FREI, Urs STAMMBACH. — **Die Mathematiker an den Zürcher Hochschulen.** — Un vol. broché, 17×24, de 73 p. — Prix : DM 17.80. — Birkhäuser Verlag, Basel, 1994.

Das vorliegende Buch gibt einen Überblick über die Entwicklung der Mathematik an den beiden Zürcher Hochschulen bis in die sechziger Jahre dieses Jahrhunderts hinein, wobei die personellen Aspekte im Vordergrund stehen. Der Text wird von vielen Abbildungen, darunter Porträts der meisten Mathematiker, die in Zürich tätig gewesen sind, illustriert.

Helmut HOFER, Eduard ZEHNDER. — **Symplectic invariants and Hamiltonian dynamics.** — Birkhäuser advanced texts. — Un vol. relié, 17×24, de xiii, 341 p. — Prix : DM 88.00. — Birkhäuser Verlag, Basel, 1994.

The discoveries of the last decade have opened new perspectives on the old field of Hamiltonian systems and led to the creation of a new field: symplectic topology. A class of symplectic invariants, called symplectic capacities, is the main theme of this book, which includes such topics as basic symplectic geometry, symplectic capacities and rigidity, periodic orbits for Hamiltonian systems and the least action principle, a bi-invariant metric on the symplectic diffeomorphism group and its geometry.

Jane CRONIN. — **Differential equations: introduction and qualitative theory.** — Second edition, revised and expanded. — Pure and applied mathematics, vol. 180. — Un vol. relié, 16×24, de xi, 370 p. — Prix : US\$ 125.00. — Marcel Dekker, Basel, 1994.

The book presents geometric and topological methods. The second edition studies periodic solutions, including bifurcation theory, on a more advanced level. It is a useful reference or self-study guide for mathematicians and mathematical analysts, chemists, biologists, physicists, engineers, and others interested in these disciplines as well as in mathematical physiology and biology.

Advances in Hopf algebras. — Edited by Jeffrey Bergen and Susan Montgomery. — Lecture notes in pure and applied mathematics, vol. 158. — Un vol. broché, 18×25, de vii, 326 p. — Prix : US\$ 135.00. — Marcel Dekker, New York, 1994.

This reference covers topics such as quantum groups, Hopf Galois theory, actions and coactions of Hopf algebras, smash and cross products, and the structure of cosemisimple Hopf algebras... examines the actions of quasitriangular Hopf algebras on quantum-commutative algebras... studies some general principles on how to construct algebras and comodule algebras.

Fourier analysis: analytic and geometric aspects. — Edited by William O. Bray, P.S. Milojevic, Caslav V. Stanojevic. — Lecture notes in pure and applied mathematics, vol. 157. — Un vol. broché, 18×25, de viii, 450 p. — Prix : US\$ 150.00. — Marcel Dekker, New York, 1994.

Containing the authoritative contributions of more than 25 experts, the volume discusses new approaches to classical problems in the theory of trigonometric series... singular integrals/pseudodifferential operators... Fourier analysis on various groups...numerical aspects of Fourier analysis and their applications... wavelets, and more.

Analysis, algebra, and computers in mathematical research. — Proceedings of the twenty-first Nordic Congress of Mathematicians. — Edited by Mats Gyllenberg, Lars Erik Persson. — Lecture notes in pure and applied mathematics, vol. 156. — Un vol. broché, 18×25, de ix, 408 p. — Prix : US\$ 150.00. — Marcel Dekker, New York, 1994.

This reference volume explores new results in research areas such as stochastic partial differential equations, population dynamics, and computer algebra systems... analyzes the most frequently appearing combinatorial sums and provides a technique for recognising such formulas... delineates the ideas behind a methodology based on integrals used to derive matrix perturbation bounds, etc.

Louis H. KAUFFMAN and Sostenes L. LINS. — **Temperley-Lieb recoupling theory and invariants of 3-manifolds.** — Annals of mathematics studies, vol. 134. — Un vol. broché, 16×24, de viii, 296 p. — Prix : US\$ 22.50 (Relié : US\$ 49.50). — Princeton University Press, Princeton N.J., 1994.

This monograph develops, in a self-contained manner, a recoupling theory for colored knots and links with trivalent graphical vertices. The theory is based on underlying properties of the bracket polynomial and tangle-theoretic Temperley-Lieb algebra. This recoupling theory is the direct analog, in this context, of the corresponding theory for q -deformed angular momentum recoupling using the quantum group $SL(2)_q$.

Bruce STEPHENSON. — **The music of the Heavens: Kepler's harmonic astronomy.** — Un vol. relié, 16×24, de xi, 260 p. — Prix : £ 30.00. — Princeton University Press, Princeton, N.J., 1994.

Challenging critics who characterize Kepler's theories of harmonic astronomy as "mystical", Bruce Stephenson offers the first thorough technical analysis of the music the astronomer thought the heavens made, and the logic that led him to find musical patterns in his data. In doing so, Stephenson illuminates crucial aspects of Kepler's intellectual development, particularly his way of classifying and drawing inferences.

Bruce STEPHENSON. — **Kepler's physical astronomy.** — Un vol. broché, 15×23, de 216 p. — Princeton University Press, Princeton, N.J., 1994.

By closely and clearly analyzing the text of Kepler's great astronomical works, in particular the *Astronomia nova* of 1609, Bruce Stephenson demonstrates the importance of Kepler's physical principles - principles now known to be "incorrect" in the creation of his first two laws of planetary motion. This book explores and explains the development of Kepler's planetary theory and the physical hypotheses integral to that theory.

Howard ANTON, Chris RORRES. — **Elementary linear algebra: applications version.** — Seventh edition. — Un vol. broché, de 20×25, de xvi, 779, 57 p. — Prix : £22.50. — John Wiley, New York, 1994.

This book is an expanded version of "Elementary Linear Algebra", seventh edition, by Howard Anton. The first ten chapters of this book are identical to the first ten chapters of that text, the eleventh chapter consists of 20 applications of linear algebra drawn from business, economics, engineering, physics, computer science, approximation theory, ecology, sociology, demography, and genetics.

Ulf GRENANDER. — **General pattern theory: a mathematical study of regular structures.** — Oxford mathematical monographs. — Oxford science publications. — Un vol. relié, 20×26, de XXI, 883 p. — Prix : £130.00. — Clarendon Press, Oxford, 1993.

The aim of pattern theory is to create mathematical knowledge representations of complex systems, analyze the mathematical properties of the resulting regular structures, and to apply them to practically occurring patterns in nature and the man-made world. Starting from an algebraic formulation, this book studies such representations in terms of their topological, dynamical, and probabilistic aspects.

Proceedings of the 7th International Congress on Mathematical Education. — Actes du 7^e Congrès international sur l'enseignement des mathématiques: Québec, 17-23 août 1992. — Edited by Claude Gaulin, Bernard R. Hodgson, David H. Wheeler, John C. Eggsgard. — Un vol. broché, 15×23, de XXIII, 495 p. — Prix: Can\$45.00. — Les Presses de l'Université Laval, Sainte-Foy, 1994.

This book comprises the Proceedings of the 7th International Congress on Mathematical Education (ICME-7) which was held at Université Laval, Québec City, Canada, from August 17 to 23, 1992. It includes the texts of the four plenary lectures, reports of forty-five groups and of the mini-conference on calculators and computers, and an overview of other activities on the program.

Selected lectures from the 7th International Congress on Mathematical Education. — Choix de conférences du 7^e Congrès international sur l'enseignement des mathématiques: Québec 17-23 August 1992. — Edited by David F. Robitaille, David H. Wheeler, Carolyn Kieran. — Un vol. broché, 15×23, de XII, 370 p. — Prix: Can\$45.00. — Les Presses de l'Université de Laval, Sainte-Foy, 1994.

This book is a companion volume to the Proceedings of the 7th International Congress on Mathematical Education (ICME-7), which was held at Université Laval, Québec City, Canada, from 17 to 23, 1992. It comprises the presentations of twenty-seven invited lectures -distinguished theorists, researchers, and practitioners- from around the world.

Margreet KUIJPER. — **First-order representations of linear systems.** — System & control. — Un vol. relié, 16×24, de 196 p. — Prix : DM 98.00. — Birkhäuser, Boston, 1994.

In this book, the author develops representation theory from a behavioral point of view and focuses on various types of (“generalized state space”) first-order representations that commonly arise in the process of modeling. It covers minimality, derives transformation groups and offers realization methods that lead directly to minimal realizations. The book further presents generalized notions of controllability indices and observability indices .

Avner FRIEDMAN, Walter LITTMAN. — **Industrial mathematics : a course in solving real-world problems.** — Un vol. broché, 18×26, de XIII, 136 p. — Prix : US\$22.50. — Society for Industrial and Applied Mathematics, Philadelphia, 1994.

The authors of this book have undertaken the approach of presenting real industrial problems and their mathematical modeling as a motivation for developing mathematical methods that are needed for solving the problems. Each chapter presents and studies, by mathematical analysis and computations, one important problem that arises in today’s industry. This book introduces new ideas on ordinary and partial differential equations, integral equations, and control theory.

Xuerong MAO. — **Exponential stability of stochastic differential equations.** — Monographs and textbooks in pure and applied mathematics, vol. 182. — Un vol. relié, 16 x 24, de XII, 307 p. — Prix : US\$125.00. — Marcel Dekker, New York, 1994.

This volume presents a systematic study of current developments in stochastic differential delay equations driven by nonlinear integrators - detailing various exponential stabilities for stochastic differential equations and largescale systems. It illustrates the practical use of stochastic stabilization, stochastic destabilization, stochastic flows, and stochastic oscillators in numerous real-world situations.

Shui-Nee CHOW, Chengzhi LI, Duo WANG. — **Normal forms and bifurcation of planar vector fields.** — Un vol. relié, 16 x 24, de VIII, 472 p. — Prix : £45.00. — Cambridge University Press, Cambridge, 1994.

This book is concerned with bifurcation theory, the study of the changes in the structure of the solutions of ordinary differential equations as parameters of the model vary. Chapters 1-2 introduce two systematic methods of simplifying equations, center-manifold theory and normal-form theory. Chapters 3-5 study in considerable detail the bifurcation of those one- or two-dimensional equations with one, two or several parameters.

Francis BORCEUX. — **Handbook of categorical algebra 1: basic category theory.** — Encyclopedia of mathematics and its applications, vol. 50. — Un vol. relié, 16×24, de xv, 345 p. — Prix : £45.00. — Cambridge University Press, Cambridge, 1994.

This is an up-to-date and integrated introduction to model theory. Model theory is concerned with the notions of definition, interpretation and structure in a very general setting, and is applied to a wide variety of other areas such as set theory, geometry, algebra and computer science. The author emphasises definability and methods of construction, and introduces the reader to advanced topics such as stability.

The Grothendieck theory of dessins d’enfants. — Edited by Leila Schneps. — London Mathematical Society lecture note series, vol. 200. — Un vol. broché, 16×23, de 368 p. — Prix : £24.95. — Cambridge University Press, Cambridge, 1994.

Dessins d'enfants are combinatorial objects, namely drawings with vertices and edges on topological surfaces. Their interest lies in their relation with the set of algebraic curves defined over the closure of the rationals, and the corresponding action of the absolute Galois group on them. The various articles here unite all the basics of the subject as well as the most recent advances.

S.A. HUGGETT, K.P. TOD. — **An introduction to twistor theory. — Second edition.** — London Mathematical Society student texts, vol. 4. — Un vol. broché, $15,6 \times 23$, de XII, 178 p. — Prix : £35.00. — Cambridge, Cambridge University Press, 1994.

This book is an introduction to twistor theory and modern geometrical approaches to space-time structure. The book will provide graduate students with an introduction to the literature of twistor theory, presupposing some knowledge of special relativity and differential geometry. It would also be of use for a short course on space-time structure independently of twistor theory.

Raoul BOTT. — **Collected papers, vol.1: Topology and Lie groups.** — Edited by Robert D. MacPherson. — Contemporary mathematicians. — Un vol. relié, $18,5 \times 26$, de XII, 584 p. — Prix : DM 198.00. — Birkhäuser, Boston, 1994.

In addition to covering Bott's papers on topology and Lie groups, volume 1 contains personal recollections and mathematical commentaries by some of his students and colleagues, including Hans Samelson, Steve Smale, Wilfried Schmid, Jonathan Block, and Michael J. Hopkins. Volume 1 contains also two autobiographical sketches by Bott and mathematical papers and essays which portray Bott as a mathematician, record his charm and his buoyant enthusiasm for life and mathematics.

Raoul BOTT. — **Collected papers, vol. 2: Differential operators.** — Edited by Robert D. MacPherson. — Contemporary mathematicians. — Un vol. relié, $18,5 \times 26$, de XXXIII, 802 p. — Prix : DM 198.00. — Birkhäuser, Boston, 1994.

This volume contains most of Raoul Bott's papers on the relations between topology and analysis. In the early 1960s, Bott, along with Atiyah, Hirzebruch, and Singer, brought about a revolution in this subject. Volume 2 also contains Bott's own commentaries on some of the papers contained in this volume, a special introduction by R. MacPherson ; additionally there are three commentaries on Bott's legacy from V. Vassiliev, M. Atiyah, and E. Getzler.

S.P. NOVIKOV. — **Solitons and geometry.** — Lezioni Fermiane. — Un vol. broché, 17×24 , de 58 p. — Prix : £9.95. — Accademia Nazionale dei Lincei, Pisa, 1992.

Introduction. Plan of the lectures. Poisson structures. — Poisson structures on finite-dimensional manifolds. Hamiltonian systems. Completely integrable systems. — Classical analogue of the Dirac monopole. Complete integrability and algebraic geometry. — Poisson structures on loop spaces. Systems of hydrodynamic type and differential geometry. — Non-linear WKB (Hydrodynamics of weakly deformed soliton lattices).