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David M. ARNOLD. — **Finite rank torsion free abelian groups and rings.** — Lecture notes in mathematics, vol. 931, — Un vol. broché,  $17 \times 25$ , de vii, 191 p. — Prix: DM 24.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

Types and rank-1 groups. Examples of indecomposable groups and direct sums. Endomorphism rings and decompositions of rank-2 groups. Pure subgroups of completely decomposable groups. Homogeneous completely decomposable groups and generalizations. Completely decomposable groups and generalizations. Additive categories, quasi-isomorphism and near-isomorphism. Stable range, substitution, cancellation, and exchange properties. Subrings of finite dimensional  $Q$ -algebras. Orders in finite dimensional simple  $Q$ -algebras. Maximal orders in finite dimensional simple  $Q$ -algebras. Near isomorphism and genus class. Grothendieck groups. Additive groups of subrings of finite dimensional  $Q$ -algebras.  $Q$ -simple and  $p$ -simple groups.

**Analytic theory of continued fractions.** Proceedings of a seminar-workshop held at Loen, Norway, 1981. — Edited by W. B. Jones, W. J. Thron, and H. Waadeland. — Lecture notes in mathematics, vol. 932. — Un vol. broché,  $17 \times 25$ , de vi, 240 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

In recent years there has been a renewed interest in the subject of continued fractions. This is due in part to the advent of computers and the resulting importance of the algorithmic character of continued fractions. It is also due to the close connection between continued fractions and Padé approximants and their application to theoretical physics and chemistry. The proceedings present recent results in the analytic theory of continued fractions and also in applications and in computational problems. Two survey articles are included.

Richard SOT. — **Simple morphisms in algebraic geometry.** — Lecture notes in mathematics, vol. 935. — Un vol. broché,  $17 \times 25$ , de iv, 146 p. — Prix: DM 19.80. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

The Zariski topology, the Jacobian criterion and examples of simple algebras over a field  $k$ . The Kähler 1-differentials. Every  $k$ -algebra  $A$  which is essentially of finite type over  $k$  and simple is a regular local ring. Brief discussion of unramified and étale homomorphisms. Some corollaries to theorem. Fitting ideals. Proof of the Jacobian criterion and some characterization of simple  $k$ -algebras and  $A$ -algebras. Characterization of simple  $A$ -algebras in terms of étale homomorphisms; invariance of the property of being a simple algebra under composition and change of base. Descent of simple homomorphisms and removal of all noetherian assumptions. Simple morphisms of preschemes and translation of previous theorems into the language of preschemes.

S. M. KHALEELULLA. — **Counterexamples in Topological Vector Spaces.** — Lecture notes in mathematics, vol. 936. — Un vol. broché,  $17 \times 25$ , de XXI, 179 p. — Prix: DM 24.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

Topological vector spaces. — Locally convex spaces. — Special classes of locally convex spaces. — Special classes of topological vector spaces. — Ordered topological vector spaces. — Hereditary properties. — Topological bases. — Topological algebras.

Edmond COMBET. — **Intégrales Exponentielles.** — Lecture notes in mathematics, vol. 937. — Un vol. broché,  $17 \times 25$ , de VIII, 114 p. Prix: DM 19.80. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

*Développements asymptotiques*: Cas des points critiques non-dégénérés. Développement asymptotique des intégrales exponentielles. Cas des singularités isolées. — *Propriétés Lagrangiennes*: Notes sur les exposants critiques. Changements de phases. Variétés Lagrangiennes et hamiltoniens. Phases naturelles en calcul des variations.

**Number theory.** — Proceedings of the Third Matscience Conference held at Mysore, India, June 3-6, 1981. — Edited by K. Alladi. Lecture notes in mathematics, vol. 938. — Un vol. broché,  $17 \times 25$ , de IX, 177 p. — Prix: DM 24.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

10 exposés par: Krishnaswami Alladi. — Paul Erdős. — R. J. Hans-Gill. — R. Jagannathan and T. S. Santhanam. — V. S. Joshi. — L. Mohan and D. Suryanarayana. — K. Ramachandra. — M. Ram Murthy. — R. Sivaramakrishnan and B. K. Vijayan. — S. Vangipuram.

Problems proposed by Krishnaswami Alladi, K. Ramachandra, M. Ram Murthy and R. Sivaramakrishnan in the problem session chaired by Paul Erdős.

**Martingale Theory in Harmonic Analysis and Banach Spaces.** — Proceedings of the NSF-CBMS Conference held at the Cleveland State University, Cleveland, Ohio, July 13-17, 1981. — Edited by J.-A. Chao and W.A. Woyczynski. — Lecture notes in mathematics, vol. 939. — Un vol. broché,  $17 \times 25$ , de VIII, 225 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

19 exposés par: Deborah Allinger. — Klaus Bichteler and David Fonken. — Halina Byczkowska and Andrezj Hulanicki. — J.-A. Chao. — Burgess Davis and John L. Lewis. — Gerald A. Edgar, Annie Millet and Louis Sucheston. — Nassif A. Ghoussoub. — Adalid Gutierrez and H. Elton Lacey. — Anna T. Lawniczak. — Carl Mueller. — C. W. Onneweer. — Chull Park. — Gilles Pisier. — Lawrence H. Riddle and Jerry J. Uhl, Jr. — Jan Rosinski. — Jan Rosinski and Jerry Szulgy. — William H. Ruckle. — Gideon Schechtman. — Wojbor A. Woyczynski.

André LEGRAND. — **Homotopie des Espaces de Sections.** — Lecture notes in mathematics, vol. 941. — Un vol. broché,  $17 \times 25$ , de VII, 132 p. — Prix: DM 19.80. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

Ensembles simpliciaux au-dessus de  $B$ . —  $B$ -fibrés principaux. — Fibrés en groupes de fibre de type  $K(\Pi, n)$ . — Homotopie de l'espace des sections d'un fibré en groupes. — Différentielle de la suite spectrale de Shih.

**Commutative Algebra: Analytical Methods.** — Edited by Richard N. Draper. — Lecture notes in pure and applied mathematics, vol. 68. — Un vol. broché, 18 × 26, de VIII, 291 p. — Prix: FS 115.00. — Marcel Dekker, Inc., New York/Basel, 1982.

19 exposés par: S. C. Kothari and J. C. Wilson. — William J. Gordon. — Jonathan Wahl. — Paul Roberts. — Kei-ichi Watanabe. — Andrew R. Kustin and Matthew Miller. — Sarah Glaz. — Herbert H. Snyder. — Richard N. Draper and Klaus Fischer. — E. Graham Evans and Philipp A. Griffith. — Joseph Lipman. — Gary A. Harris. — Joseph Becker. — Craig Huneke. — Shiro Goto and Yasuhiro Shimoda. — Edward L. Green. — Saul Lubkin. — Paul Eakin and Avinash Sathaye. — Jon L. Hohnson.

Jan Van GEEL. — **Places and Valuations in Noncommutative Ring Theory.** — Lecture notes in pure and applied mathematics, vol. 71. — Un vol. broché, 18 × 26, de VII, 112 p. — Prix: FS 58.00. — Marcel Dekker, Inc., New York/Basel, 1982.

*The General Theory*: Primes in rings. The extension theorem for primes. Primes in algebras. — *Value functions related to primes*: Valuations in skewfields. Value functions in partially ordered sets and total subrings. Arithmetical rings and arithmetical pseudo-valuations. — *Primes related to the arithmetic of central simple algebras*: Primes in central simple algebras. The arithmetic of central simple algebras. Function algebras: the Riemann-Roch Theorem.

**Algebraic Structures and Applications.** — Proceedings of the First Western Australian Conference on Algebra. — Ed. by Phillip Schultz, Cheryl E. Praeger, Robert P. Sullivan. — Lecture notes in pure and applied mathematics, vol. 74. — Un vol. broché, 18 × 26, de IX, 168 p. — Prix: FS 89.00. — Marcel Dekker, Inc., New York/Basel, 1982.

*Gary Davis*: Notes on Zero Divisors and Group Presentations. — *I. Martin Isaacs*: Solvable groups and their characters. — *Cheryl E. Praeger*: Graphs and their automorphism groups. — *Chris Rowley*: The group of the Hungarian magic cube. — *R. A. Bailey*: Dual abelian groups in the design of experiments. — *T. P. Speed and R. A. Bailey*: On a class of association schemes derived from lattices of equivalence relations. — *L. Fuchs*: Modules over valuation rings. — *B. J. Gardner*: When are radical classes of abelian groups closed under direct products? — *William H. Cornish*: On Iséki's BCK-Algebras. — *L. Fuchs and P. Schultz*: The Jacobson radical of the endomorphism ring of a valued vector space. — *J. A. MacDougall*: A survey of length problems in Grassmann spaces. — *Henry Rose*: Semidistributive lattice varieties.

L. BICAN, T. KEPKA, P. NEMEC. — **Rings, Modules, and Preradicals.** — Lecture notes in pure and applied mathematics, vol. 75. — Un vol. broché, 18 × 26, de IX, 241 p. — Prix: FS 105.00. — Marcel Dekker, Inc., New York/Basel, 1982.

Preliminaries. — Preradicals and their properties. — Idempotent radicals and torsion theories. — Filters and radical filters of left ideals. — Injectivity and projectivity. — Semi-perfect and perfect rings. — Splitting properties. — Splitting properties — continuation. — Preradicals and dimensions. — *Appendix*: Rings with trivial orthogonal Ext-theories. Examples.

Peter FLETCHER and William F. LINDGREN. — **Quasi-uniform spaces.** — Lecture notes in pure and applied mathematics, vol. 77. — Un vol. broché, 18 × 26, de VIII, 216 p. — Prix: FS 89.00. — Marcel Dekker, Inc., New York/Basel, 1982.

Elementary properties of quasi-uniformities and quasi-proximities. — Approximations of symmetry. — Completeness. — Topological ordered spaces. — Covering properties of quasi-uniform spaces. — Transitive spaces. — Quasi-metrizable spaces.

Moise SIBONY, Jean-Claude MARDON. — **Analyse numérique I**, Systèmes linéaires et non linéaires. — Actualités scientifiques et industrielles, vol. 1405. — Un vol. broché, 18 × 24, de 532 p. — Prix: FF 138.00. — Hermann, Paris, 1982.

*Rappels et compléments d'algèbre linéaire* : Les matrices. Matrice et application linéaire. Les déterminants. Vecteurs propres et valeurs propres. Localisation des valeurs propres. Matrices irréductibles. Matrices non négatives. Normes vectorielles et normes matricielles. — *Méthodes numériques de résolution de systèmes linéaires* : Introduction. Les méthodes directes. Critères d'inversibilité d'un système linéaire. Notions de stabilité et de précision. Les méthodes itératives. — *Méthodes numériques de résolution de systèmes non linéaires* : Résolution d'une équation non linéaire. Résolution d'une équation algébrique. Résolution de systèmes d'équations non linéaires. Systèmes non linéaires avec contraintes. Problèmes d'optimisation. Application à la résolution numérique de problèmes aux limites non linéaires. — *Méthodes numériques de calcul des valeurs et vecteurs propres* : Méthodes directes, cas de matrices quelconques. Méthodes directes, cas des matrices symétriques. Méthodes itératives, cas des matrices symétriques. Méthodes itératives, cas des matrices quelconques.

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*Approximation, interpolation, dérivation et intégration numériques* : Rappels sur l'approximation. Approximation polynômiale. Autres approximations. Interpolation polynômiale. Dérivation numérique. Intégration numérique. — *Méthodes numériques de résolution d'équations différentielles* : Problèmes de Cauchy. Existence et unicité de la solution. Méthodes numériques, généralités. Méthode d'Euler-Cauchy. Etude générale des méthodes à 1 pas. Etude générale des méthodes à pas multiples. — *Méthodes numériques de résolution d'équations aux dérivées partielles* : Les équations aux dérivées partielles. La méthode des différences finies. La méthode des éléments finis.

**Emmy Noether: a tribute to her life and work.** — Ed. by James W. Brewer and Martha K. Smith. — Un vol. relié, 16 × 24, de VII, 173 p. — Prix: FS 45.00. — Marcel Dekker, Inc., New York/Basel, 1982.

*Biography* : Emmy Noether and her influence (Clark Kimberling) — *Noether and her colleagues* : Mathematics at the university of Göttingen (Saunders Mac Lane). My personal recollections of Emmy Noether (Olga Taussky). Obituary of Emmy Noether (B. L. van der Waerden). In memory of Emmy Noether (P. S. Alexandroff). — *Noether's mathematics* : Galois theory (Richard G. Swan). The calculus of Variations (E. J. McShane). Commutative ring theory (Robert Gilmer). Representation theory (T. Y. Lam). Algebraic

number theory (A. Fröhlich). — *Noether's address to the 1932 international congress of mathematicians*: Hypercomplex systems and their relations to commutative algebra and number theory (Emmy Noether).

Ki Hang Kim. — **Boolean matrix theory and applications**. — Pure and applied mathematics, vol. 70. — Un vol. relié, 16 × 24, de xiv, 288 p. — Prix: FS 115.00. — Marcel Dekker, Inc., New York/Basel, 1982.

*Fundamental concepts*: Boolean vectors. Boolean matrices. Green's relations. Rank and combinatorial set theory. Eigenvectors. Quadratic equations. — *Algebraic properties*: Regular elements and idempotents. Maximal subgroups. Group-complexity. Other properties. — *Inverses*: Generalized inverse. Minimum norm  $g$ -inverses and least squares  $g$ -inverses. Thierrin-Vagner inverses. Moore-Penrose inverses. — *Combinatorial properties of order relations*: Topologies. Similarity relations on partially ordered sets. Connective relations on general partially ordered sets. Applications to economics. Hall relations. — *Asymptotic forms*: Graphical characterization. Convergent and oscillatory matrices. Primitive matrices. Series of powers of Boolean matrix. Applications. *Appendix*: Matrices over an arbitrary Boolean algebra. Fuzzy matrices.

T.A. BANCROFT, Chien-Pai HAN. — **Statistical theory and inference in research**. Statistics: textbooks and monographs, vol. 39. — Un vol. relié, 16 × 24, de xiv, 372 p. — Prix: FS 98.00. — Marcel Dekker, Inc., New York/Basel, 1982.

Introduction. — Probability. — Univariate parent population distributions. — Properties of univariate distribution functions. — Bivariate and multivariate distributions and their properties. Derived sampling distributions. — Point estimation. — Sampling from finite populations. — Interval estimation. — Tests of hypotheses. — Nonparametric testing procedures. — Inference based on conditional specification. — Regression analysis. — Analysis of variance. — Appendix: Matrix algebra. Table of maximum and minimum relative efficiencies for pooling means. Tables of probability distributions.

Christian BLATTER. — **Analysis III**. — Zweite, verbesserte und erweiterte Auflage. — Heidelberger Taschenbücher, vol. 153. — Un vol. broché, 14 × 21, de ix, 296 p. — Prix: DM 26.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

Hauptsätze der mehrdimensionalen Differentialrechnung. — Flächen im  $\mathbf{R}^n$ . — Das Jordansche Mass im  $\mathbf{R}^m$ . — Mehrfache Integrale. — Variablentransformation bei mehrfachen Integralen. — Flächen im  $\mathbf{R}^3$ . — Vektorfelder. — Die Greensche Formel für ebene Bereiche. — Der Satz von Stokes. — Der Satz von Gauss. — Fourier-Reihen. — Die Sätze von Fejér und Jordan. — Fourier-Analyse auf  $\mathbf{R}$ .

**Catastrophe theory and applications**. — Ed. by D. K. Sinha. Un vol. relié, 15 × 22, de 158 p. — Prix: £10.95. — John Wiley & Sons, New York/Chichester/Brisbane/Toronto, 1982.

Introductory glimpses of catastrophe theory (E. C. Zeeman). — Applicable catastrophe theory I, Stability of ships (E. C. Zeeman). — Applicable catastrophe theory II, light caustics (E. C. Zeeman). — Applicable catastrophe theory III, the analysis of some dis-

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Robert KALABA, Karl SPINGARN. — **Control, identification, and input optimization.** — Mathematical concepts and methods in science and engineering, vol. 25. — Un vol. relié, 16 × 24, de XI, 431 p. — Prix: US\$39.50. — Plenum Press, New York/London, 1982.

*Introduction.* — *Optimal control and methods for numerical solutions* : Optimal control. Numerical solutions for linear two-point boundary-value problems. Numerical solutions for nonlinear two-point boundary-value problems. — *System identification* : Gauss-Newton method for system identification. Quasilinearization method for system identification. Applications of system identification. — *Optimal inputs for system identification* : Optimal inputs. Additional topics for optimal inputs. Applications of optimal inputs. — *Computer programs* : Computer programs for the solution of boundary-value and identification problems.

Iain T. ADAMSON. — **Introduction to field theory.** — 2d edition. — Un vol. broché, 12 × 19, de VIII, 181 p. — Prix: £4,95 (relié: £12.50). — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney. 1982.

*Elementary definitions* : Rings and fields. Elementary properties. Homomorphisms. Vector spaces. Polynomials. Higher polynomial rings, rational functions. — *Extensions of fields* : Elementary properties. Simple extensions. Algebraic extensions. Factorisation of polynomials. Splitting fields. Algebraically closed fields. Separable extensions. — *Galois theory* : Automorphisms of fields. Normal extensions. The fundamental theorem of Galois theory. Norms and traces. The primitive element theorem, Lagrange's theorem. Normal bases. — *Applications* : Finite fields. Cyclotomic extensions. Cyclotomic extensions of the rational number field. Cyclic extensions. Wedderburn's theorem. Ruler-and-compasses constructions. Solution by radicals. Generic polynomials.

K. G. BINMORE. — **Mathematical analysis: a straightforward approach.** — Un vol. broché, 16 × 23, de XI, 361 p. — Prix: £6,95 (relié: £18,00). — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1982.

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K. D. ELWORTHY. — **Stochastic differential equations on manifolds.** — London Mathematical Society lecture note series, vol. 70. — Un vol. broché,  $15 \times 23$ , de 325 p. — Prix: £15,00. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1982.

Preliminaries and notation. — Kolmogorov's theorem, Totoki's theorem, and Brownian motion. — The integral: estimates and existence. — Special cases. — The change of variable formula. — Stochastic integral equations. — Stochastic differential equations on manifolds. — Regularity. — Diffusions. — *Appendix*: Manifolds and fibre bundles. Some differential geometry using the frame bundle. Some measure theoretic technicalities.

A. GARDINER. — **Infinite processes, background to analysis.** — Un vol. relié,  $16 \times 24$ , de IX, 306 p. — Prix: US\$32.90. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

*From calculus to analysis*: What's wrong with the calculus? Growth and change in mathematics. — *Number*: Mathematics: rational or irrational? Constructive and non-constructive methods in mathematics. Common measures, highest common factors and the game of Euclid. Sides and diagonals of regular polygons. Numbers and arithmetic — A quick review. Infinite decimals (part 1). Infinite decimals (part 2). Recurring nines. Fractions and recurring decimals. The fundamental property of real numbers. The arithmetic of infinite decimals. Reflections on recurring themes. Continued fractions. — *Geometry*: Numbers and geometry. The role of geometrical intuition. Comparing areas. Comparing volumes. Curves and surfaces. — *Functions*: What is a number? What is a function? What is an exponential function?

André LICHNEROWICZ. — **Choix d'œuvres mathématiques.** — Un vol. relié  $18 \times 25$ , de 633 p. — Prix: FF 248.00. — Hermann, éditeurs des sciences et des arts, Paris, 1982.

*Relativité*: Propriétés statistiques des ensembles de particules en relativité restreinte. L'intégration des équations de la gravitation relativiste et le problème des  $n$ -corps. Sur le caractère euclidien d'espaces-temps extérieurs statiques partout réguliers. Ondes et radiations électromagnétiques et gravitationnelles en relativité générale. Propagateurs et commutateurs en relativité générale. Champs spinoriels et propagateurs en relativité générale. Ondes de choc gravitationnelles et électromagnétiques. — *Géométrie*: Courbures, nombres de Betti, et espaces symétriques. Groupes d'holonomie des variétés riemanniennes. Espaces riemanniens et hermitiens symétriques. Un théorème sur les espaces homogènes complexes. Groupes d'holonomie. Isométries et transformations analytiques d'une variété kählerienne compacte. Laplacien sur une variété riemannienne et spineurs. Spineurs harmoniques. Variétés kähleriennes et première classe de Chern. Applications harmoniques dans un tore. Applications harmoniques et variétés kähleriennes. — *Algèbres de Lie infinies classiques et physique mathématique*: Sur l'algèbre des automorphismes infinitésimaux d'une variété symplectique. Algèbre de Lie des automorphismes infinitésimaux d'une structure unimodulaire. Les variétés de Poisson et leurs algèbres de Lie associées. Algèbres de Lie attachées à un feuilletage. Sur les algèbres formelles associées par déformation à une variété symplectique. La géométrie des transformations canoniques.

Rudy RUCKER. — **Infinity and the mind: the science and philosophy of the infinite.** — Un vol. relié, 16,5 × 24, de x, 342 p. — Prix: FS 35.00. — Birkhäuser, Boston/Basel/Stuttgart, 1982.

*Infinity*: A short history of infinity. Physical infinities. Infinities in the mindscape. The absolute infinite. Connections. — *All the numbers*: From Pythagoreanism to Cantorism. Transfinite numbers. Infinitesimals and surreal numbers. Higher physical infinities. *The unnameable*: The Berry paradox. Random reals. What is truth? — *Robots and souls*: Gödel's incompleteness theorem. Conversations with Gödel. Towards robot consciousness. Beyond mechanism? — *The one and the many*: The classical one/many problem. What is a set? The universe of set theory. Interface enlightenment. — *The transfinite cardinals*: One and alef-one. Cardinality. The continuum. Large cardinals. — *Gödel's incompleteness theorems*: Formal systems. Self-reference. Gödel's proof. A technical note on man-machine equivalence. — Answers to the puzzles and paradoxes. (Puzzles and paradoxes à la fin de chaque chapitre).

J. FRITZ, J. L. LEBOWITZ and D. SZASZ, editors. — **Random fields: rigorous results in statistical mechanics and quantum field theory. Vol. 1.** — Colloquia mathematica societatis Janos Bolyai, 27. — Un vol. relié, 17 × 24 de 568 p. — North-Holland publishing company, Amsterdam/Oxford/New York, 1981.

29 exposés par: L. Accardi — S. Albeverio, R. Høegh-Krohn — H. Araki — H. Baumgärtel, J. Rehberg, M. Wollenberg — J. Bellissard, G. F. De Angelis — G. Benfatto, F. Nicolo — P. M. Bleher — E. Brüning — Ph. Combe, R. Rodriguez, M. Sirugue, M. Sirugue-Collin — A. S. Cooper — R. L. Dobrushin, E. A. Pecherski — F. Dunlop — R. S. Ellis, J. S. Rosen — V. Enss — P. Ferrero, B. Schmitt — K. Fleischmann — R. G. Flood, W. G. Sullivan — H. Föllmer — J. Fritz — J. Fröhlich — S. Goldstein, J. L. Lebowitz, E. Presutti — R. B. Griffiths — Ch. Gruber, Ch. Lugin, Ph. A. Martin — Z. Haba — J. L. van Hemmen, R. G. Palmer — Y. Higuchi — R. Holley, D. Stroock — R. L. Hudson, P. D. F. Ion.

J. FRITZ, J. L. LEBOWITZ and D. SZASZ, editors. — **Random fields: rigorous results in statistical mechanics and quantum field theory. Vol. 2.** — Colloquia mathematica societatis Janos Bolyai, 27. — Un vol. relié, 17 × 24, de p. 571-1111 — Prix: US\$186.00/Dfl 400.00 pour les 2 volumes. — North-Holland publishing company, Amsterdam/Oxford/New York, 1981.

34 exposés par: D. Iagolnitzer, B. Souillard — R. B. Israël — G. Jona-Lasinio, F. Martinelli, E. Scoppola — J. R. Klauder — R. Kotecky, D. Preiss — P. Kruszyński — H. Kunz, B. Souillard — J. T. Lewis, M. Winnink — R. Lang, X. Nguyen-Xuan — J. Löffelholz — V. A. Malyshev, R. A. Minlos — C. Marchioro, A. Pellegrinotti, M. Pulvirenti — D. H. Mayer — A. Messenger — S. Miracle-Sole — M. G. Mürmann — B. S. Nahapetian — I. Palasti — G. C. Papanicolaou, S. R. S. Varadhan — E. N. Petrova — S. Pogosian — G. Roepstorff — L. Rosen — E. Seiler — S. B. Shlosman — R. Siegmund-Schultze, E. Warmuth, W. Warmuth — B. Simon — H. Spohn — A. Süto — D. Szasz — Y. Takahashi — S. Taqqu — A. Verbeure — H. V. Weiszäcker, G. Winkler.

Walter LEDERMANN and Steven VAJDA, editors. — **Handbook of applicable mathematics, vol. 4: Analysis.** — Un vol. relié, 17 × 25, de xxiii, 865 p. — Prix: £27.50/US\$75.00. — John Wiley & Sons, Chichester/New York/Brisbane/Toronto/Singapore, 1982.

Sequences and series. — Functions of one (real) variable. — Differential calculus. — Integral calculus. — Functions of several (real) variables. — Multiple integrals. — Ordinary differential equations. — Partial differential equations. — Functions of a complex variable. — Special functions. — Metric spaces. — Integral transforms. — Mathematical modelling. — Non-linear programming. — Dynamic programming. — Classical mechanics — Stochastic differential equations. — Functional analysis. — Fourier series. — Inequalities.

David J. BARTHOLOMEW. — **Mathematical methods in social science.** — Handbook of applicable mathematics, guidebook 1. — Un vol. broché, 15,5 × 23, de ix, 153 p. — Prix: £5.95/US\$14.90. — John Wiley & Sons, Chichester/New York/Brisbane/Toronto, 1981.

Introduction. — Pattern, variation and inference. — Collection of data: design and analysis of surveys. — Multivariate methods in social science. — The dynamics of social systems.

F. KAPPEL & W. SCHAPPACHER. — **Evolution equations and their applications.** — Research notes in mathematics, vol. 68. — Un vol. broché, 17 × 24, de 313 p. — Pitman advanced publishing program, Boston/London/Melbourne, 1982.

*F. Kappel*: Wolfgang Hahn: an address in honour of his 70th birthday. — 20 exposés par: V. Barbu — V. Capasso & L. Maddalena — N. Carmichael, A. J. Pritchard & M. D. Quinn — G. da Prato — G. W. Desch — G. di Blasio — J. A. Goldstein — R. Grimmer — J. R. Haddock — M. Iannelli — N. H. Pavel — A. Pazy — M. A. Pozio — D. Salamon — E. Sinestrari — A. Vanderbauwhede — G. Vidossich — R. Vinter — G. F. Webb — F. Zanolin.

**Probability and statistical inference.** — Proceedings of the 2nd Pannonian symposium on mathematical statistics, Bad Tatzmannsdorf, Austria, June 14-20, 1981. — Ed. by Wilfried Grossmann, Georg Ch. Pflug and Wolfgang Wertz. — Un vol. relié, 16,5 × 24,5 de viii, 389 p. — Prix: Dfl 120.00. — D. Reidel Publishing Company, Dordrecht/Boston/London, 1982.

35 exposés par: J. Adler — J. Andel — I. Ban & J. Pergel — G. Bankövi, J. Veliczky & M. Ziermann. — T. Bednarski, S. Gnot & T. Ledwina — P. Bod — P. Deheuvels — R. Dutter & I. Ganster — D. M. Enachescu — T. Gerstenkorn — J. K. Ghorai & V. Susarla — W. Grossmann — M. Huskova & T. Ratering — J. Husty — L. B. Klebanov & J. A. Melamed — F. Konecny — P. Kosik & K. Sarkadi — A. Krzyzak & M. Pawlak — N. Kusolitsch — H. Läuter — A. Lesanovsky — F. Moricz — E. Neuwirth — H. Niederreiter — A. Pazman & J. Volaufova — G. Ch. Pflug — W. Polasek — Z. Praskova — S. T. Rachev — E. Ronchetti — L. Rutkowski — E. Stadlober — S. Suján — W. Wertz.

Wilhelm KLINGENBERG. — **Riemannian geometry.** — De Gruyter studies in mathematics vol. 1. — Un vol. relié,  $17 \times 24,5$  de x, 396 p. — Prix: DM 98.00. — Walter de Gruyter, Berlin/New York, 1982.

*Foundations*: Review of differential calculus and topology. Differentiable manifolds. Tensor bundles. Immersions and submersions. Vector fields and tensor fields. Covariant derivation. The exponential mapping. Lie groups. Riemannian manifolds. Geodesics and convex neighborhoods. Isometric immersions. Riemannian curvature. Jacobi fields. — *Curvature and topology*: Completeness and cut locus. Appendix: orientation. Symmetric spaces. The Hilbert manifold of  $H^1$ -curves. The loop space and the space of closed curves. The second order neighborhood of a critical point. Index and curvature. Appendix: the injectivity radius for  $\frac{1}{4}$  pinched manifolds. Comparison theorems for triangles. The sphere theorem. Non-compact manifolds of positive curvature. — *Structure of the geodesic flow*: Hamiltonian systems. Properties of the geodesic flow. Stable and unstable motions. Geodesics on surfaces. Geodesics on the ellipsoid. Closed geodesics on spheres. The theorem of the three cosed geodesics. Manifolds of non-positive curvature. The geodesic flow on manifolds of negative curvature.

Eberhard ZEIDLER. — **Vorlesungen über nichtlineare Funktionalanalysis II: monotone Operatoren.** — 3. Aufl. — Teubner-Texte zur Mathematik, vol. 9. — Un vol. broché,  $14,5 \times 20,5$ , de 256 p. — Prix: M 19.50. — BSB B. G. Teubner Verlagsgesellschaft, Leipzig, 1981.

Einführung in die Gesamtproblematik. — Untersuchung linearer Probleme. — Verallgemeinerung auf nichtlineare stationäre Probleme. — Verallgemeinerung auf nichtlineare instationäre Probleme. — Allgemeine Theorie der Diskretisierungsverfahren. — Anhang.

G. BIESS, H. ERFURTH, G. ZEIDLER. — **Optimale Prozesse und Systeme.** — 2. Aufl. — Mathematik für Ingenieure, Naturwissenschaftler, Ökonomen und Landwirte, vol. 16. — Un vol. broché,  $16,5 \times 23$ , de 108 p. — Prix: M 12.00. — BSB B. G. Teubner Verlagsgesellschaft, Leipzig, 1980.

Einleitung. — Optimale Prozesse und damit zusammenhängende Begriffe. — Stetige Prozesse. — Diskrete Prozesse.

Th. BRÖCKER and K. JÄNICH. — **Introduction to differential topology.** — Translated by C. B. and M. J. Thomas. — Un vol. broché,  $15 \times 23$ , de viii, 160 p. — Prix: £5.95. — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1982.

Manifolds and differentiable structures. — Tangent space. — Vector bundles. — Linear algebra for vector bundles. — Local and tangential properties. — Sard's theorem. — Embedding. — Dynamical systems. — Isotopy of embeddings. — Connected sums. — Second order differential equations and sprays. — The exponential map and tubular neighbourhoods. — Manifolds with boundary. — Transversality.

**The geometric vein: the Coxeter Festschrift.** — Edited by Chandler Davis, Branko Grünbaum, F. A. Sherk. — Un vol. relié, 16 × 24, de VIII, 598 p. — Prix: DM 122.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1981.

Some material presented in this book may be new even to specialists. — *Polytopes and honeycombs*: 14 exposés par: Branko Grünbaum, J. C. P. Miller, and G. C. Shephard. — Branko Grünbaum and G. C. Shephard. — Jean J. Pedersen. — P. McMullen. — William J. Gilbert. — Patrice Assouad. — H. S. M. Coxeter. — I. J. Schoenberg. — Donald W. Crowe. — Patrick Du Val. — J. M. Goethals and J. J. Seidel. — S. G. Hoggar. — Stanley E. Payne. — Asia Weiss. — *Extremal problems*: 6 exposés par: I. M. Yaglom. — L. Fejes Toth. — C. A. Rogers. — J. M. Wills. — P. R. Goodey and M. M. Woodcock. — Ignace I. Kolodner. — *Geometric transformations*: 10 exposés par: J. C. Fisher, D. Ruoff, and J. Shilleto. — W. L. Edge. — I. M. Yaglom. — J. F. Rigby. — J. B. Wilker. — Norman W. Johnson. — Erich W. Ellers. — G. Ewald. — B. A. Rosenfeld, N. I. Hari-tonova, and I. N. Kashirina. — Cyril W. L. Garner. — *Groups and presentations of groups*: 7 exposés par: William M. Kantor. — Jeffrey Cohen. — J. Tits. — David Ford and John McKay. — Howard L. Hiller. — C. M. Campbell and E. F. Robertson. — *The combinatorial side*: 4 exposés par: W. T. Tutte. — Joseph Malkevitch. — W. O. J. Moser. — Harold N. Ward.

Shui-Nee CHOW, Jack K. HALE. — **Methods of bifurcation theory.** — Grundlehren der mathematischen Wissenschaften, vol. 251. — Un vol. relié, 16 × 24, de xv, 515 p. — Prix: DM 128. — Springer-Verlag, New York/Berlin/Heidelberg, 1982.

Elements of nonlinear analysis. — Applications of the implicit function theorem. — Variational method. — The linear approximation and bifurcation. — Bifurcation with one dimensional null space. — Bifurcation with higher dimensional null spaces. — Some applications. — Bifurcation near equilibrium. — Bifurcation of autonomous planar equations. — Bifurcation of periodic planar equations. — Normal forms and invariant manifolds. — Higher order bifurcation near equilibrium. — Perturbation of spectra of linear operators.

Norman ALVEY, Nick GALWEY, Peter LANE. — **An introduction to Genstat.** — Un vol. broché, 19 × 24,5, de VIII, 152 p. — Prix: £8.50. — Academic press, London/New York/Paris/San Diego/San Francisco/Sao Paulo/Sydney/Tokyo/Toronto, 1982.

Basic operations: "reading, writing and arithmetic". — Picturing the data. — Linear regression analysis. — Language: "Genstat as she is spoke". — Tabulation. — Analysis of designed experiments. — Programming: suiting analysis to your problem. — Additional facilities for data manipulation. — Additional facilities for statistical analysis. — Telling the computer about your Genstat job. — Exercices à la fin des chapitres.

**Statistics and probability: essays in honor of C. R. Rao.** — Edited by G. Kallianpur, P. R. Krishnaiah, J. K. Ghosh. — Un vol. relié, 17 × 24,5, de XII, 722 p. — Prix: Dfl 310.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

66 exposés par: T. W. Anderson and George P. H. Styan. — Somesh Chandra Bagchi. — R. R. Bahadur. — A.V. Balakrishnan. — G. A. Barnard. — O. Barndorff-Nielsen. — M. S. Bartlett. — D. Basu and R. C. Tiwari. — B. R. Bhat. — Peter J. Bickel and Joseph

A. Yahav. — R. C. Bose and H. K. Iyer. — Lawrence D. Brown. — O. Bunke and M. Möhner. — T. Cacoulios and H. Papageorgiou. — I. M. Chakravarti and Catherine T. Burton. — Tapas K. Chandra and J. K. Ghosh. — S. D. Chatterji. — D. R. Cox. — Harald Cramer. — Somesh Das Gupta. — A. P. Dempster. — S. W. Dharmadhikari. J. L. Doob. — Hilmar Drygas. — Daniel Dugué. — C. Fang and P. R. Krishnaiah. — J. Gani. — R. Gnanadesikan, J. R. Kettenring and J. M. Landwehr. — V. P. Godambe. — Shanti S. Gupta and Klaus-J. Miescke. — E. J. Hannan. — C. C. Heyde. — J. L. Hodges Jr. and E. L. Lehmann. — A. T. James. — Wesley Johnson and Seymour Geisser. — A. M. Kagan, I. A. Melamed and A.A. Zinger. — G. Kallianpur. — Samuel Karlin. — Tatsuo Kawata. — Oscar Kempthorne. — C. G. Khatri. — J. Kiefer. — Y. Kojima, H. Morimoto and K. Takeuchi. — R. G. Laha and V. K. Rohatgi. — L. Le Cam. — Eugene Lukacs. — M. Mahfoud and G. P. Patil. — Joseph Mathew and M. G. Nadkarni. — Sujit Kumar Mitra. — P. A. P. Moran. — Ingram Olkin and Sam C. Saunders. — R. P. Pakshirajan and R. Vasudeva. — George C. Papanicolaou and S. R. S. Varadhan. — K. R. Parthasarathy and Kalyan B. Sinha. — P. K. Pathak. B. L. S. Prakasa Rao. — Madan L. Puri and Stefan S. Ralescu. — B. Ramachandran. — M. M. Rao. — J. Rice and M. Rosenblatt. — Yu. A. Rozanov. — Pranab Kumar Sen. — Ryoichi Shimizu. — J. N. Srivastava and W. M. Ariyaratna. — V. S. Varadarajan. — G. S. Watson. — Publications of C. R. Rao.

**The numerical solution of nonlinear problems.** — Edited by Christopher T. H. Baker and Chris Phillips. — Un vol. relié, 16 × 24, de VIII, 369 p. — Prix: £16.00. — Oxford university press, London, 1981.

Algebraic and transcendental equations. — Initial-value problems in ordinary differential equations. — Boundary-value problems in ordinary differential equations. — Partial differential equations. Integral equations. — Approximation. — Programming techniques.

F. KASCH. — **Modules and rings.** — A translation of *Moduln und Ringe*. — Translation and editing by D.A.R. Wallace. — London Mathematical Society monographs, vol. 17. — Un vol. relié, 16 × 24, de XI, 372 p. — Prix: £33.80. — Academic press, London/New York/Paris/San Diego/San Francisco/Sao Paulo/Sydney/Tokyo/Toronto, 1982.

Fundamental ideas of categories. — Modules, submodules and factor modules. — Homomorphisms of modules and rings. — Direct products, direct sums, free modules. — Injective and projective modules. — Artinian and Noetherian modules. — Local rings: Krull-Remak-Schmidt theorem. — Semisimple modules and rings. — Radical and socle. — The tensor product, flat modules and regular rings. — Semiperfect modules and perfect rings. — Rings with perfect duality. — Quasi-Frobenius rings.

David BURGHEs, Ian HUNTLEY and John McDONALD. — **Applying mathematics: a course in mathematical modelling.** — Ellis Horwood series in mathematics and its applications. — Un vol. relié, 16 × 24, de 194 p. — Prix: £16.50 (broché: £6.50). — Ellis Horwood Limited, Chichester, Halsted press: a division of John Wiley and Sons, New York/Brisbane/Chichester/Toronto, 1982.

*Mathematics and society*: King Arthur's round table. Aircraft collisions. Whaling. — *Mathematical modelling*: Handicapping weightlifters. Voting models. Attractiveness of

competing shopping centres. Break-even analysis. Shortest stopping distances. Maximising traffic flow through tunnels. Retail price index. Investment opportunity. Stock control. Advertising expenditure. Communication satellites. Kepler's third planetary law. A miracle at Mexico City? Shot putt analysis. Population estimation. Apportionment. Forestry management. Drug therapy. Rats. A replacement policy for fuel injection pumps. — *Applying mathematics*: Mathematics and the real world. Understanding the real world. Getting to grips with problems. Systems thinking, an example. Constructing models. Choice of model from. Model validation. — *Problems*: 26 problems.

Michael WOODROOFE. — **Nonlinear renewal theory in sequential analysis.** — CBMS-NSF regional conference series in applied mathematics, vol. 39. — Un vol. broché, 18 × 25, de IV, 119 p. — Prix: £9.00. — Society for industrial and applied mathematics, Philadelphia, Pennsylvania, (distributed by John Wiley and Sons, Chichester), 1982.

Randomly stopped sequences. — Random walks. — The sequential probability ratio test. — Nonlinear renewal theory. — Local limit theorems. — Open-ended tests. — Repeated significance tests. — Multiparameter problems. — Estimation following sequential testing. — Sequential estimation. — Proof of the renewal theorem.

Bradley EFRON. — **The jackknife, the bootstrap and other resampling plans.** — CBMS-NSF regional conference series in applied mathematics, vol. 38. — Un vol. broché, 18 × 25, de VII, 92 p. — Prix: £8.00. — Society for industrial and applied mathematics, Philadelphia, Pennsylvania (distributed by John Wiley and Sons, Chichester), 1982.

The jackknife estimate of bias. — The jackknife estimate of variance. — Bias of the jackknife variance estimate. — The bootstrap. — The infinitesimal jackknife, the delta method and the influence function. — Cross validation, jackknife and bootstrap. — Balanced repeated replications (half-sampling). — Random subsampling. — Non-parametric confidence intervals.

Michel HERVE. — **Les fonctions analytiques.** — Collection « Mathématiques ». — Un vol. broché, 15 × 22, de 302 p. — Prix: FF 135.00. — Presses universitaires de France, Paris, 1982.

Familles sommables. — Séries entières à une ou plusieurs variables. — L'anneau des séries entières à  $m$  variables dont l'ensemble de sommabilité est voisinage de l'origine. — Applications et fonctions analytiques. — Fonctions analytiques multiformes et prolongement analytique. — Homotopie. — Applications et fonctions holomorphes: cas d'une variable complexe. — Le point de vue de Cauchy sur les applications analytiques: cas d'une variable complexe. — Points singuliers isolés. — Formule des résidus et applications: fonctions elliptiques, développements classiques, calcul d'intégrales. — Le point de vue de Cauchy dans le cas de plusieurs variables complexes. Topologie sur l'espace des applications analytiques. — Construction de fonctions analytiques de variables complexes par des procédés impliquant une convergence. — La représentation conforme. — Fonctions harmoniques d'une variable complexe. — Fonctions sous-harmoniques ou surharmoniques d'une variable complexe. — Problèmes d'approximation dans le plan. — Espaces de Hardy attachés à un disque ouvert. — La fonction modulaire. — Annexes: Notions d'algèbre, d'intégrale, propriétés des espaces de Banach. — Exercices à la fin de chaque chapitre.

Jean COMBES. — **Suites et séries.** — Collection « Mathématiques ». — Un vol. broché, 15 × 22, de 206 p. — Prix: FF 85.00. — Presses universitaires de France, Paris, 1982.

Suites de nombres. — Séries. — Suites et séries de fonctions. — Séries entières. — Séries trigonométriques. — Séries de Fourier. — Exercices à la fin de chaque chapitre.

P. A. FIRBY and C. F. GARDINER. — **Surface topology.** — Ellis Horwood series in mathematics and its applications. — Un vol. relié, 16 × 24, de 216 p. — Prix: £19.50 (broché: £6.90). — Ellis Horwood Ltd., Chichester, Halsted press: a division of John Wiley and Sons, New York/Brisbane/Chichester/Toronto, 1982.

Intuitive ideas. — Plane models of surfaces. — Surfaces as plane diagrams. — Distinguishing surfaces. — Patterns on surfaces. — Maps and graphs. — Vector fields on surfaces. — Plane tessellation representations of compact surfaces. — Some applications of tessellation representations. — Introducing the fundamental group. — Exercices à la fin de chaque chapitre, avec solutions.

**Theory and applications of singular perturbations.** — Proceedings of a conference held in Oberwolfach, August 16-22, 1981. — Edited by W. Eckhaus and E. M. de Jager. — Lecture notes in mathematics, vol. 942. — Un vol. broché, 17 × 25, de v, 363 p. — Prix: DM 44.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

The Oberwolfach conference whose proceedings are contained in this volume, was devoted to recent developments in the theory of singular perturbations, applications to that theory to problems in mechanics, physics and biology, and to numerical methods for problems of singular perturbation. A small number of contributions are surveys of special topics presented at the request of the editors.

Vincenzo ANCONA, Giuseppe TOMASSINI. — **Modifications analytiques.** — Lecture notes in mathematics, vol. 943. — Un vol. broché, 17 × 25, de iv, 120 p. — Prix: DM 19.80. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

*Géométrie analytique formelle*: Espaces analytiques formels. Algèbres analytiques formelles. Solutions d'équations analytiques formelles et théorème de rigidité. — *Quelques constructions*: Théorèmes de comparaison. Spec an et proj an. Faisceaux amples. Eclatements. — *Théorie des modifications*: Modifications analytiques, formelles. Applications méromorphes. Théorèmes de structure des modifications analytiques. — *Théorèmes d'existence des modifications analytiques*: Le cas algébrique. Les théorèmes de Nakano et Fujiki. Analytisation des modifications formelles. Equivalence de voisinages de sous-espaces analytiques. — *Théorèmes d'algébrisation*: Espaces de Moisezon relatifs. Théorèmes d'algébrisation. Applications.

**Representations of algebras.** — Workshop notes of the third international conference on representations of algebras held in Puebla, Mexico, August 4-8, 1980. — Edited by M. Auslander and E. Lluís. — Lecture notes in mathematics, vol. 944. — Un vol. broché, 17 × 25, de v, 258 p. — Prix: DM 33.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

*William H. Gustafson*: The history of algebras and their representations. — *Idun Reiten*: The use of almost split sequences in the representation theory of Artin algebras. —

*Maurice Auslander* : A functorial approach to representation theory. — *Hanspeter Kraft* : Geometric methods in representation theory.

**Measure theory, Oberwolfach 1981.** — Proceedings of the conference held at Oberwolfach, Germany, June 21-27, 1981. — Edited by D. Kölzow and D. Maharam-Stone. — Lecture notes in mathematics, vol. 945. — Un vol. broché, 17 × 25, de xv, 431 p. — Prix: DM 49.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

These are the proceedings of a conference on measure theory attended by 51 mathematicians from 17 countries. 36 papers were presented in a variety of areas such as general measure theory, descriptive set theory and measurable selections, lifting and disintegration, differentiation of measures and integrals, measure theory and functional analysis, non-scalar-valued measures, measures on linear spaces, stochastic processes, ergodic theory, Feynman integral. An additional feature was the problem session, whose discussions are also included.

**Algebraic threefolds.** — Proceedings of the 2nd 1981 session of the Centro internazionale matematico estivo (C.I.M.E.), held at Varenna, Italy, June 15-23, 1981. — Edited by Alberto Conte. — Lecture notes in mathematics, vol. 947. — Un vol. broché, vii, 315 p. — Prix: DM 39.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

*K. Ueno* : Bimeromorphic geometry of algebraic and analytic threefolds. — *J. P. Murre* : Classification of Fano threefolds according to Fano and Iskovskih. — *C. H. Clemens* : Degeneration techniques in the study of threefolds. — *S. Mori* : Threefolds whose canonical bundles are not numerically effective. — *A. Beauville* : Les singularités du diviseur de la jacobienne intermédiaire de l'hypersurface cubique. — *A. Collino* : The fundamental group of the Fano surface. — *A. Conte* : On threefolds whose hyperplane sections are Enriques surfaces. — *A. J. Sommese* : Ample divisors on 3-folds. — *H. Esnault, E. Viehweg* : Revêtements cycliques. — *P. M. H. Wilson* : Some questions on the canonical ring of threefolds of general type. — *M. Levine* : Deformations of irregular threefolds. — *S. L. Kleiman* : Plane forms and multiple-point formulas.

**Complex analysis.** — Proceedings of the Summer school, held at the International centre for theoretical physics Trieste, July 5-30, 1980. — Edited by J. Eells. — Lecture notes in mathematics, vol. 950. — Un vol. broché, 17 × 25, de iv, 428 p. — Prix: DM49.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

*M. G. Eastwood* : Twistor theory (the Penrose transform). — *L. Lemaire and J. C. Wood* : An introduction to analysis on complex manifolds. — *M. Nacinovich* : Complex analysis and complexes of differential operators. — *M. S. Narasimhan* : Deformations of complex structures and holomorphic vector bundles. — *W. Stoll* : Introduction to value distribution theory of meromorphic maps. — *D. Sundararaman* : Compact Hausdorff transversally holomorphic foliations. — *G. Trautman* : Holomorphic vectorbundles and Yang Mills fields.

**Combinatorial and geometric structures and their applications.** — Edited by A. Barlotti. — Annals of discrete mathematics, vol. 14. — North-Holland mathematics studies, vol. 63. — Un vol. broché, 17 × 24, de viii, 292 p. — Prix: Dfl 95.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

In recent times the advent of the electronic age and the development of computer technology has given great impetus to the study of combinatorial techniques both by

providing combinatorists with a powerful new tool and also by creating a new field of application for those techniques. The topics of combinatorics considered in this volume are: Galois geometries; survey of areas recently studied: finite geometries; the state of the art from a combinatorial point of view on generalized quadrangles and nonlinear structures, and design theory; a profound and thorough study of special classes of design.

Jean François COLOMBEAU. — **Differential calculus and holomorphy: real and complex analysis in locally convex spaces.** — North-Holland mathematics studies, vol. 64. — Notas de matematica, vol. 84. — Un vol. broché,  $17 \times 24$ , de XII, 456 p. — Prix: Dfl 140.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

*A review of the linear background.* — *Basic differential calculus and holomorphy:* Differentiable mappings and holomorphic mappings: basic properties. Classical properties of holomorphic mappings. Topologies. Approximation and density results.  $\varepsilon$ -product and kernel theorems. The Fourier-Borel and Fourier transforms. Nuclearity of spaces of holomorphic or  $C^\infty$  mappings. — *Convolution and  $\bar{\partial}$  equations:* Convolution equations in  $P(E)$  and in spaces of entire functions of exponential type. Division of distributions. Convolution equations in spaces of holomorphic functions. Linear finite difference partial differential equations. Pseudo-convex domains and approximation results. The  $\bar{\partial}$  equation. Some applications of the  $\bar{\partial}$  equation.

Bernard BEAUZAMY. — **Introduction to Banach spaces and their geometry.** — North-Holland mathematics studies, vol. 68. — Notas de matematica, vol. 86. — Un vol. broché, de XII, 308 p. — Prix: Dfl 90.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

*Functional analysis:* Baire's property and its consequences. Infinite-dimensional normed spaces. Reflexive Banach spaces — *The structure of some common Banach spaces:* Hilbert spaces. Schauder bases in Banach spaces. Complemented subspaces in Banach spaces. The Banach spaces  $l_p$  ( $1 \leq p \leq +\infty$ ) and  $c_0$ . Extreme points of compact convex sets and the Banach spaces  $\mathcal{C}(K)$ . The Banach spaces  $L_p(\Omega, \mathcal{A}, \mu)$  ( $1 \leq p < +\infty$ ). — *Some metric properties in Banach spaces:* Strict convexity and smoothness. Uniform convexity and uniform smoothness. — *The geometry of super-reflexive Banach spaces:* Finite representability and super-properties of Banach spaces. Basic sequences in super-reflexive Banach spaces. Uniformly non-square and  $J$ -convex Banach spaces. Renorming super-reflexive Banach spaces.

Manuel VALDIVIA. — **Topics in locally convex spaces.** — North-Holland mathematics studies, vol. 67. — Notas de matematica, vol. 85. — Un vol. broché,  $17 \times 24$ , de XIV, 510 p. — Prix: Dfl 150.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

*Some classes of locally convex spaces:* Baire spaces. Convex-Baire spaces. Quasi-barrelled, barrelled, bornological and ultrabornological spaces. Closed graph theorem. Ordered convex-Baire spaces and suprabarrelled spaces. Other results on the closed graph theorem. Finitely additive bounded measures. Weakly realcompact locally convex spaces. Inductive limits of sequences of locally convex spaces. — *Sequence spaces:* Scalar sequence spaces. Echelon and co-echelon spaces. Echelon spaces of order zero and echelon spaces of

infinite order. Examples. A class of spaces of vector sequences. — *Spaces of continuous functions*: Spaces of infinitely differentiable functions and spaces of distributions. Spaces of  $C^m$ -differentiable functions. Spaces of continuous functions.

**Graph theory.** — Proceedings of the conference on graph theory, Cambridge, held at Trinity College, 1981. — Ed. by Béla Bollobas. — North-Holland mathematics studies, vol. 62. — Annals of discrete mathematics, vol. 13. — Un vol. broché, 17 × 24, de viii, 202 p. — Prix: Dfl 100.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

In order to emphasize the variety of questions and to preserve the freshness of research, the theme of the meeting was not restricted. This volume deals with many aspects of graph theory, including: colouring, connectivity, cycles, Ramsey theory, random graphs, flows simplicial decompositions and directed graphs. A number of papers are concerned with related areas, including: hypergraphs, designs, algorithms, game on graphs, designs and social models.

H. DAVENPORT. — **The higher arithmetic: an introduction to the theory of numbers.** — 5th ed. — Un vol. broché, 14 × 22, de 189 p. — Prix: £5.00 (relié: £12.00). — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1982.

Factorization and the primes. — Congruences. — Quadratic residues. — Continued fractions. — Sums of squares. — Quadratic forms. — Some Diophantine equations. — Exercices avec solutions.

B. A. BARNES, G. J. MURPHY, M. R. F. SMYTH and T. T. WEST. — **Riesz and Fredholm theory in Banach algebras.** — Research notes in mathematics, vol. 67. — Un vol. broché, 17 × 24,5, de 123 p. — Prix: £7.95. — Pitman advanced program, Boston/London/Melbourne, 1982.

*Operator theory*: Fredholm operators. Riesz operators. Range inclusion. Action on the commutant. The wedge operators. — *Fredholm theory*: Minimal ideals and Barnes idempotents. Primitive and general Banach algebras. — *Riesz theory*: Riesz elements: algebraic properties, spectral theory. Riesz algebras: characterisation, examples. — *C\*-algebras*: The wedge operator. Decomposition theorems. Riesz algebras. A representation. — *Applications*: Fredholm and Riesz elements in subalgebras. Seminormal elements in C\*-algebras. Operators leaving a fixed subspace invariant. Triangular operators on sequence spaces. Algebras of quasi-triangular operators. Measures on compact groups. — *Banach algebras*: Spectral theory. The structure space. Minimal ideals and the socle. C\*-algebras.

**Nonlinear partial differential equations and their applications. Collège de France, seminar, volume III.** — Edited by H. Brezis and J. L. Lions, coordinated by D. Cioranescu. — Research notes in mathematics, vol. 70. — Un vol. broché, 17 × 24,5, de 432 p. — Prix: £12.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1982.

This book contains the texts of selected lectures delivered at a weekly seminar held at the Collège de France. in 1980-81. It includes contributions by leading experts from various

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

A. M. BERTHIER. — **Spectral theory and wave operators for the Schrödinger equation.** — Research notes in mathematics, vol. 71. — Un vol. broché,  $17 \times 24$ , de 305 p. — Prix: £12.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1982.

Notions from Hilbert space theory. — Self-adjointness. — Spectral theory. — Integration in Hilbert space. — Wave operators. — Completeness of the wave operators. — Restriction to spheres. — The singular spectrum. — Periodic potentials and absence of positive Eigenvalues of Schrödinger operators. — Eigenfunction expansions. — Geometrical approach. — Scattering theory.

Domingo A. HERRERO. — **Approximation of Hilbert space operators, volume I.** — Research notes in mathematics, vol. 72. — Un vol. broché,  $17 \times 24$ , de XIII, 255 p. — Prix: £10.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1982.

Stability and approximation. — An apéritif: approximation problems in finite dimensional spaces. — The main tools of approximation. — Two results borrowed from the theory of  $C^*$ -algebras. — Limits of nilpotent and algebraic operators. — Quasi-triangularity. — The structure of a polynomially compact operators. — Closures of similarity orbits of nilpotent operators.

**Logic colloquium '81.** — Proceedings of the Herbrand symposium held in Marseilles, France, July 1981. — Edited by J. Stern. — Studies in logic and the foundations of mathematics, vol. 107. — Un vol. relié,  $15,5 \times 23$ , de XI, 384 p. — Prix: Dfl 130.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

*Papers connected with the life or work of J. Herbrand*: 7 exposés par: C. Chevalley. — J. Dieudonné. — A. Guinier. — W. Bibel. — J.-Y. Girard. — G. Kreisel. — J. van Heijenoort. — *General contributions*: 18 exposés par: C. N. Delzell. — H. Gaifman. — G. Jäger. — H. R. Jervell. — J. P. Jones and J. V. Matijasevic. — A. S. Kechris. — A. H. Lachlan. — A. Louveau. — M. Makkai. — D. Marker. — J. Porte. — J. P. Res-sayre. — J. Saffe. — U. R. Schmerl. — R. I. Soare and M. Stob. — J. van de Wiele. — J. Vauzeilles. — W. H. Woodin.

**Logic colloquium '80.** — Papers intended for the European Summer meeting of the Association for symbolic logic. — Edited by D. van Dalen, D. Lascar, T. J. Smiley. — Studies in logic and the foundations of mathematics, vol. 108. — Un vol. relié,  $15,5 \times 23$ , de X, 342 p. — Prix: Dfl 120.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

The topics in this book include: set theory, model theory, constructive mathematics, intuitionism and arithmetic. — 18 exposés par: B. Balcar, P. Simon. — M. J. Beeson. — P. Cegielsky, K. McAloon, G. Wilmers. — G. Cherlin, U. Felgner. — D. van Dalen. —

S. Feferman. — R. O. Gandy. — L. Harrington, S. Shelah. — A. Kanamori. — R. Laver. — M. Lerman, J. B. Bremmel. — W. Mitchell. — R. A. Shore. — S. G. Simpson. — C. Smorynski. — A. S. Troelstra. — A. J. Wilkie. — A. Zarach.

**Applied time series analysis.** — Proceedings of the International conference held at Houston, Texas, August 1981. — Edited by O. D. Anderson and M. R. Perryman. — Un vol. relié, 16 × 23, de VIII, 526 p. — Prix: Dfl 160.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

This book contains many of the papers which were presented at the second American time series meeting (5th ITSM) held at Houston, Texas, 6-7 August 1981. It includes a most important plenary contribution on "Direct quadratic spectrum estimation" by D. W. Marquardt and S. K. Acuff, and the very welcome return to time series of Professor J. S. White, who treats the distribution of the serial correlation coefficient. The majority of the remaining articles are extremely workmanlike practical applications of time series analysis and forecasting, mainly in the time domain.

**Nonlinear problems: present and future.** — Proceedings of the first Los Alamos conference on nonlinear problems, Los Alamos, N. M., U.S.A., March 2-6, 1981. — Edited by Alan Bishop, David Campbell, Basil Nicolaenko. — Un vol. broché, 17 × 24, de XII, 482 p. — Prix: Dfl 150.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

Befitting an inaugural conference a wide spectrum of topics in nonlinear science are represented through survey lectures and original contributions. Giving a cross section of active research topics in the field of nonlinear science, it includes: (onset of and fully developed) turbulence in plasmas and fluids; nonlinearity in field theory and low-dimensional solids, reaction-diffusion processes, new methods in nonlinear mathematics.

**Studies in functional analysis.** — Edited by R. G. Bartle. — Studies in mathematics, vol. 21. — Un vol. relié, 14 × 21, de XI, 225 p. — Prix: £12.85. — The mathematical Association of America, Washington, D.C., distributed by John Wiley and Sons Ltd., Chichester, 1980.

*F. F. Bonsall and J. Duncan*: Numerical ranges. — *E. W. Cheney*: Projection operators in approximation theory. — *William B. Johnson*: Complementably universal separable Banach spaces, an application of counterexamples to the approximation problem. — *R. R. Phelps*: Integral representations for elements of convex sets. — *H. H. Schaefer*: Aspects of Banach lattices.

**Groups — St Andrews 1981.** — Edited by C. M. Campbell and E. F. Robertson. — London mathematical society lecture note series, vol. 71. — Un vol. broché, 15 × 22,5, de VIII, 359 p. — Prix: £17.50. — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1982.

An international conference "Groups — St. Andrews 1981" was held in the Mathematical Institute, University of St. Andrews during the period 25th July to 8th August 1981.

The main topics of the conference: combinatorial group theory; infinite groups; general groups, finite or infinite; computational group theory are all well-represented in the survey and research articles that form these proceedings.

Ulrich WITT and Joachim PERSKE. — **SMS — a program package for simulation and gaming of stochastic market processes and learning behavior.** — Lecture notes in economics and mathematical systems, vol. 202. — Un vol. broché, 16,5 × 24, de vii, 266 p. — Prix: DM 44.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

*Problems and results*: Theoretical background. Some applications and results. — *The economic model of individual behavior and the market interaction*: Restrictions on the firm's behavior. Simulating interaction in the market. Simulating the behavioral response. Applications of SMS in laboratory experimentation and classroom-teaching: the gaming version. — *Program organization and input-output facilities: the technical part*: The controlling program sections. Input and control facilities. Output-facilities.

**Compilation of input-output tables.** — Proceedings of a session of the 17th general conference of the International Association for research in income and wealth, Gouvieux, France, August 16-22, 1981. — Edited by Jiri V. Skolka. — Lecture notes in economics and mathematical systems, vol. 203. — Un vol. broché, 16,5 × 24, de vii, 307 p. — Prix: DM 48.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

Professional statisticians and economic model builders will find in the book a good presentation of the state of art in input-output compilation. One can see how input-output statistics are being integrated into national accounts and how they can improve their quality. But vast data systems can be mastered only by efficient computers and rational organization of data storage. Open methodological questions seem to be concentrated in two fields; in pricing (for example, valuation at approximate basic values, treatment of value added tax or construction of tables at constant prices) and in the separation of flows of domestic origin from imported flows.

**Ergodic theory and dynamical systems II.** — Proceedings, special year, Maryland 1979-80. — Edited by A. Katok. — Progress in mathematics, vol. 21. — Un vol. relié, 15,5 × 23,5, de xi, 210 p. — Prix: FS 36.00. — Birkhäuser, Boston/Basel/Stuttgart, 1982.

*Z. Nitecki*: Topological dynamics on the interval. — *W. Szlenk*: Some dynamical properties of certain differentiable mappings of an interval, part II. — *E. M. Coven, J. Madden, Z. Nitecki*: A note on generic properties of continuous maps. — *R. Adler, L. Flatto*: Cross section maps for geodesic flows, I (the modular surface). — *M. Brin*: Ergodic theory of frame flows. — *E. Slud*: Products of independent randomly perturbed matrices. — *P. Rabinowitz*: On large norm periodic solutions of some differential equations.

**Séminaire de théorie des nombres, Paris 1980-81: Séminaire Delange-Pisot-Poitou.** — Edited by Marie-José Bertin. — Progress in mathematics, vol. 22. — Un vol. relié, 15,5 × 23,5, de vii, 362 p. — Prix: FS 44.00. — Birkhäuser, Boston/Basel/Stuttgart, 1982.

Ce livre reproduit la plupart des conférences faites au Séminaire de théorie des nombres de Paris (Delange-Pisot-Poitou), 1980-81. Ces conférences exposent les recherches récentes

d'éminents théoriciens des nombres du monde entier, dans des domaines variés et difficiles où abondent parfois les conjectures de longue date. Cet ouvrage montre donc les progrès réalisés dans ces diverses voies et ouvre aux jeunes chercheurs de talent de brillantes perspectives.

A. WEIL. — **Adeles and algebraic groups.** — Progress in mathematics, vol. 23. — Un vol. relié, 15,5 × 23,5, de 126 p. — Prix: FS 26.00. — Birkhäuser, Boston/Basel/Stuttgart, 1982.

*Preliminaries on Adele-geometry*: Adeles. Adele-spaces attached to algebraic varieties. Restriction of the basic field. — *Tamagawa measures*: The case of an algebraic variety: the local measure. The global measure and the convergence factors. Algebraic groups and Tamagawa numbers. — *The linear, projective and symplectic groups*: The zeta-function of a central division algebra. The projective group of a central division algebra. Isogenies. End of proof of theorem: central simple algebras. The symplectic group. Isogenies for products of linear groups. Application to some orthogonal and hermitian groups. The zeta-function of a central simple algebra. — *The other classical groups*: Classification and general theorems. End of proof of theorem. The local zeta-functions for a quadratic form. The Tamagawa number (hermitian and quaternionic cases). The Tamagawa number of the orthogonal group. — *Appendices*: The case of the group  $G_2$ . A short survey of subsequent research on Tamagawa numbers.

Patrice LIGNELET. — **La pratique du Fortran 77: 77 exercices résolus de Fortran V.** — Un vol. broché, 15,5 × 22, de 288 p. — Prix: FF 88.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Rio de Janeiro, 1982.

Les notions de base du Fortran 77. — L'exécution conditionnelle: tests et choix. — Les boucles. — Sous-programmes et fonctions. — Les tableaux et leurs applications. — Les fichiers binaires à accès séquentiel et direct. — Les entrées/sorties avec format. — Pour chaque chapitre: énoncés des exercices et leurs solutions.

A. BELAGE, J. ROUVRE, R. THEODOR. — **Exercices résolus de mathématiques générales, t. 1 et 2: C.N.A.M. niveau A.** — 2 vol. brochés, 16 × 22, de 278 p. (t. 1) et 335 p. (t. 2). — Prix: FF 78.00 chaque tome. — Masson, Paris/New York/Barcelone/Milan/Mexico/Rio de Janeiro, 1982.

Ce livre propose, outre des rappels de cours, un grand nombre d'exercices, avec leurs solutions, portant sur les programmes du 1<sup>er</sup> cycle de l'enseignement supérieur. Les exercices que proposent les auteurs, sont de niveaux gradués et leur variété permet de couvrir l'ensemble du programme. On trouve en tête de chaque chapitre, quelques rappels de cours, puis les énoncés d'exercices, et enfin les corrigés.

**The making of statisticians.** — Edited by J. Gani. — Un vol. relié, 16 × 24, de VIII, 263 p. — Prix: DM 49.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

This lively, non-technical volume is a collection of sixteen new autobiographical sketches by eminent statisticians and probabilists from widely differing backgrounds and fields of interest: Bruno de Finetti, Eugene Lukacs, Gheorghe Mihoc, M. S. Bartlett,

Mark Kac, Z. W. Birnbaum, R. C. Bose, Wassily Hoeffding, E. J. G. Pitman, R. L. Anderson, D. J. Finney, Tosio Kitagawa, L. H. C. Tippett, Herman Wold, B. Benjamin, Henry Oliver Lancaster. The contributors outline their lives, explain how they became interested in probability and statistics, give an account of their major contributions, and hazard some predictions regarding the future of the subject.

Allen McINTOSH. — **Fitting linear models: an application of conjugate gradient algorithms.** — Lecture notes in statistics, vol. 10. — Un vol. broché, 16 × 24, de vi, 200 p. — Prix: DM 29.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

The linear model. — The conjugate gradient algorithm. — Applications: The non-full rank case, the full rank case. — Examples: Gaussian linear models, generalized linear models. — Appendices: Algorithms, GLIM output.

S. FENYÖ, H. W. STOLLE. — **Theorie und Praxis der linearen Integralgleichungen, Bd. I.** — Lehrbücher und Monographien aus dem Gebiete der exakten Wissenschaften: mathematische Reihe, Bd. 74. — Un vol. relié, 17 × 24, de 328 p. — Prix: FS 80.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1982.

THEORIE DER LINEAREN OPERATOREN: *Spektraltheorie in Banachräumen*: Banachalgebren. Reguläre Elemente. Resolvente und Spektrum. Holomorphe Funktionen mit Werten in einer Banachalgebra. Der Spektralradius. Pole der Resolvente und des lösenden Elements. Pseudoinverse Elemente. Algebren mit Involution. — *Grundlagen der Theorie der linearen Operatoren*: Definitionen und Bezeichnungen. Die Algebra der beschränkten Operatoren. Der Dualraum. Invertierbare Operatoren. Projektoren und Komplementäräume. Die verallgemeinerten Inversen. Homomorphismen. Duale Operatoren. Fredholmoperatoren. Der allgemeine Alternativsatz. Vollstetige Operatoren. Produkt und Summe von Fredholmoperatoren. Das Spektrum von Operatoren. Dualsysteme und transponierte Operatoren. Der Fredholmsche Alternativsatz. — *Beschränkte Operatoren im Hilbertraum*: Normale Operatoren im Hilbertraum. Selbstadjungierte Operatoren im Hilbertraum. Die Schmidtschen Eigenwerte und Eigenelemente. Die Hilbert-Schmidtschen Operatoren. Die verallgemeinerten Schmidtschen Eigenelemente. Eine Charakterisierung linearer beschränkter Operatoren. Matrizendarstellung von Operatoren im Hilbertraum. Spektraldarstellung linearer Operatoren. Symmetrisierbare Operatoren. Von einem Parameter analytisch abhängige Operatoren. Eigenwert- und Eigenelementbestimmung mittels des Newtonschen Iterationsverfahrens. Ueber die extremale Lösung von Gleichungen. — *Integraloperatoren*: Masse und Integrale. Integraloperatoren im Raum der stetigen Funktionen. Integraloperatoren mit Diagonalkernen. Integraloperatoren mit Hadamard-Integralen. Integraloperatoren in  $L^p$ -Räumen. Fredholm-Stieltjessche Integraloperatoren.

**Multivariate approximation theory II.** — Proceedings of the conference held at the Mathematical research institute at Oberwolfach, Black Forest, February 8-12, 1982. — Edited by Walter Schempp, Karl Zeller. — International series of numerical mathematics, vol. 61. — Un vol. relié, 17 × 24, de 429 p. — Prix: FS 60.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1982.

Multivariate approximation theory is a rapidly growing area in applied mathematics and is of particularly current interest. This volume is concerned with problems of representation and approximation of real functions of several variables. Special emphasis lies

on practical applications of the theory to various fields of science. The volume reviews the "state-of-the-art" and indicates new directions for further developments in this highly active field of research.

R. V. AMBARTZUMIAN. — **Combinatorial integral geometry: with applications to mathematical stereology.** — Edited with an appendix by Adrian Baddeley. — Wiley series in probability and mathematical statistics. — Un vol. relié, 16 × 24, de xvii, 221 p. — Prix: £18.75. — John Wiley and Sons, Chichester/New York/Brisbane/Toronto/Singapore, 1982.

The invariant measure for planes in space. — Lines in the plane and other families of curves. — Alternative proofs in two dimensions. — Measures on products of line spaces. — Dimensions three and four, and beyond. — Geometrical inequalities and the construction of measures. — Pleijel-type identities for convex domains. — Shadings of convex domains. — An application to stereology of polygon processes. — An application to stereology of ergodic boolean models in  $R^2$ . — Appendix by Adrian Baddeley. — Appendix by R. V. Ambartzumian: Stereology of polyhedra: numerical results.

Jean-Pierre AUBIN, Pierre NEPOMIASTCHY et Anne-Marie CHARLES. — **Méthodes explicites de l'optimisation.** — Méthodes mathématiques de l'informatique, vol. 10. — Un vol. relié, 16 × 25, de 304 p. — Prix: FF 200.00. — Paris, Dunod, 1982.

*Programmation quadratique*: Rappels d'algèbre linéaire. Minimisation de la distance à un objectif sous contraintes d'égalités. Inverses à droite et à gauche orthogonaux. Introduction au contrôle optimal des systèmes discrets. Algorithmes de simplification de la fonction de perte et de relachement des contraintes. — *Programmation convexe*: Problèmes de minimisation généraux. Fonctions conjuguées et dualité. Calcul sous-différentiel. Résolution des problèmes de minimisation convexes. — *Modèles quadratiques de l'économie*: Sur l'allocation optimale des ressources. Economies d'échange temporelles. Equilibres non coopératifs. Modèles de production par maximisation du profit. — *Présentation du programme « MODULECO »*. — *Exercices*.

Alain BENSOUSSAN, Jacques-Louis LIONS. — **Contrôle impulsionnel et inéquations quasi variationnelles.** — Méthodes mathématiques de l'informatique, vol. 11. — Un vol. relié, 16 × 24, de 612 p. — Prix: FF 280.00. — Paris, Dunod, 1982.

Exemples d'application du contrôle stochastique et du contrôle impulsionnel dans les problèmes de gestion. — Problèmes de temps d'arrêt optimal pour processus de diffusion réfléchis. — Temps d'arrêt et contrôle stochastique relatifs à des diffusions avec saut. — Inéquations quasi variationnelles de type elliptique. — Inéquations quasi variationnelles d'évolution. — Contrôle impulsionnel et interprétation des inéquations quasivariationnelles.

**Actualités mathématiques.** — Actes du VI<sup>e</sup> congrès du regroupement des mathématiciens d'expression latine, Luxembourg, 7-12 septembre 1981. — Collection « Mu-R ». — Un vol. broché, 16 × 24, de xvi, 542 p. — Prix: FF 250.00. — Gauthier-Villars, Paris, 1982.

Ce volume contient les textes des conférences générales et les résumés de communications présentées au VI<sup>e</sup> congrès du GMEL (Luxembourg, 1981). Jean Dieudonné

expose le développement historique de la découverte des fonctions fuchsiennes par Henri Poincaré. Les articles généraux présentent des résultats originaux et font le point sur différents sujets spécifiques: algèbre, topologie, géométrie algébrique, groupes et algèbres de Lie, représentation de groupes, théorie des fonctions de variables complexes, fonctions pluriharmoniques, théorie des équations différentielles, physique et mathématique.

M. FORTIN, R. GLOWINSKI. — **Méthodes de lagrangien augmenté**: applications à la résolution numérique de problèmes aux limites. — *Méthodes mathématiques de l'informatique*, vol. 9. — Un vol. relié, 16 × 25, de xvi, 320 p. — Prix: FF 170.00. — Dunod, Paris, 1982.

Méthodes de lagrangien augmenté en programmation quadratique. — Application aux équations de Stokes et de Navier-Stokes. — Sur des méthodes de décomposition-coordination par lagrangiens augmentés. — Résolution numérique de problèmes faiblement non linéaires par des méthodes de lagrangien augmenté. — Application à la résolution de problèmes aux limites d'ordre deux fortement non linéaires. — Application de l'algorithme ALG2 à un problème d'élasto-plasticité bidimensionnel. — Application à la simulation numérique d'écoulements bidimensionnels de fluides visco-plastiques incompressibles. — Application à la résolution de problèmes d'élasticité non linéaire finie. — Application de la méthode des multiplicateurs aux inéquations variationnelles.

Jesper LÜTZEN. — **The prehistory of the theory of distributions**. — *Studies in the history of mathematics and physical sciences*, vol. 7. — Un vol. relié, 16 × 24, de viii, 232 p. — Prix: DM 118.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

Distributions in the development of functional analysis. — Generalized differentiation and generalized solutions to differential equations. — Generalized Fourier transforms. — Early generalized functions. — De Rham's currents. — Schwartz' creation of the theory of distributions. — Concluding remarks. — Appendix: Alternative definitions of generalized functions.

Jacob PALIS, Jr., Welington de MELO. — **Geometric theory of dynamical systems: an introduction**. — Translated by A. K. Manning. — Un vol. relié, 16 × 24, de xii, 198 p. — Prix: DM 74.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

Differentiable manifolds and vector fields. — Local stability. — The Kupka-Smale theorem. — Genericity and stability of Morse-Smale vector fields.

Cathleen S. MORAWETZ. — **Lectures on nonlinear waves and shocks**. — Lectures delivered at the Indian institute of science, Bangalore under the T.I.F.R. — I.I.S.C. programme in applications of mathematics. — Notes by P. S. Datti. — *Tata institute of fundamental research lectures on mathematics and physics*, vol. 67. — Un vol. broché, 18 × 24, de vi, 137 p. — Prix: DM 16.00. — Tata institute of fundamental research, Bombay; Springer-Verlag, Berlin/Heidelberg/New York, 1981.

The traffic problem and a first order nonlinear equation. — One dimensional gas dynamics. — Two dimensional steady flow.

**Representation theory: selected papers.** — I. M. Gelfand, I. N. Bernstein, S. I. Gelfand, M. I. Graev, V.A. Ponomarev, A. M. Vershik. — London mathematical society lecture note series, vol. 69. — Un vol. broché,  $16 \times 23$ , de 272 p. — Prix: relié: £15.00. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1982.

*G. Segal*: Two papers on representation theory. — *A. M. Vershik, I. M. Gelfand and M. I. Graev*: Representations of the group  $SL(2, R)$ , where  $R$  is a ring of functions. Representations of the group of diffeomorphisms. — *G. Segal*: An introduction to the paper "Schubert cells and cohomology of the spaces  $G/P$ ". — *I. N. Bernstein, I. M. Gelfand and S. I. Gelfand*: Schubert cells and cohomology of the spaces  $G/P$ . — *C.-M. Ringel*: Four papers on problems in linear algebra. — *I. N. Bernstein, I. M. Gelfand and V.A. Ponomarev*: Coxeter functions and Gabriel's theorem. — *I. M. Gelfand and V.A. Ponomarev*: Free modular lattices and their representations. Lattices, representations and algebras connected with them I and II.

R. E. EDWARDS. — **Fourier series: a modern introduction, vol. 2.** — Second edition. — Graduate texts in mathematics, vol. 85. — Un vol. relié,  $24 \times 16$ , de xi, 369 p. — Prix: DM 98.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

Spans of translates. Closed ideals. Closed subalgebras. Banach algebras. — Distributions and measures. — Interpolation theorems. — Changing signs of Fourier coefficients. — Lacunary Fourier series. — Multipliers.

A.A. KIRILLOV, A. D. GVISHIANI. — **Theorems and problems in functional analysis.** — Problem books in mathematics. — Un vol. relié,  $16 \times 24$ , de ix, 347 p. — Prix: DM 98.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

Concepts from set theory and topology. — Theory of measures and integrals. — Linear topological spaces and linear operators. — The Fourier transformation and elements of harmonic analysis. — The spectral theory of operators.

Jacques CHAZARAIN and Alain PIRIOU. — **Introduction to the theory of linear partial differential equations.** — Studies in mathematics and its applications, vol. 14. — Un vol. relié,  $16 \times 23$ , de xiv, 559 p. — Prix: Dfl 175.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

The book should serve a dual purpose: on the one hand, the first four chapters (distributions and operators; Sobolev spaces and applications; symbols, oscillatory integrals and stationary-phase theorems; pseudo-differential operators) can form the basis for an introductory post-graduate course: on the other hand, the last four chapters (elliptic boundary-value problems; evolution equations; mixed hyperbolic problems; micro-localisation) are aimed more particularly at Ph. D. Students and research workers who will find contained numerous results formerly dispersed amongst specialised journals. Each chapter ends with supplements in the form of exercises, together with hints for solution.

**Logic, methodology and philosophy of science VI.** — Proceedings of the sixth international congress of logic, methodology and philosophy of science, Hannover, 1979. — Edited by L. Jonathan Cohen, Jerzy Los, Helmut Pfeiffer, Klaus-Peter Podewski. —

Studies in logic and the foundations of mathematics, vol. 104. — Un vol. relié, 16 × 23, de xiv, 856 p. — Prix: Dfl 295.00. — North-Holland publishing company, Amsterdam/New York/Oxford, and PWN-Polish scientific publishers, Warszawa, 1982.

The general theme of this congress was “The role of mathematics in the sciences”. The scientific programme consisted of 3 plenary lectures, one memorial, 47 invited lectures and 225 contributed papers. The papers range from reports of new specific results and ideas to more general surveys of recent works. They were presented in fourteen sections: proof theory and foundations of mathematics, model theory and its applications, recursion theory and theory of computation, axiomatic set theory, philosophical logic, general methodology of science, foundations of probability and induction, foundations and philosophy of the physical sciences, of biology, of psychology, of the social sciences, of linguistics, history of logic, methodology and philosophy of science, fundamental principles of the ethics of science.

S. MARDESIC, J. SEGAL. — **Shape theory: the inverse system approach.** — North-Holland mathematical library, vol. 26. — Un vol. relié, 15,5 × 23, de xv, 378 p. — Prix: Dfl 175.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

*Foundations of shape theory*: Pro-categories. Abstract shape. Absolute neighborhood retracts. Topological shape. Inverse limits and shape of compacta. Resolutions of spaces and shape. — *Shape invariants*: Shape dimension. Pro-groups. Homotopy and homology pro-groups. Hurewicz theorem in shape theory. Whitehead theorem in shape theory. Movability of pro-groups. Movability of spaces.  $n$ -movability of spaces. Stability of spaces. — *A survey of selected topics*: Basic topological constructions and shape. Shape dimension of metric compacta. Shape of compact connected Abelian groups. Shape of the Stone-Cech compactification.  $LC^n$ -divisors and continua with  $LC^n$  shape. Complement theorems of shape theory. Embeddings up to shape. Shape fibrations. Strong shape. Cell-like maps. — *Appendix 1: polyhedra*: Topology of simplicial complexes. The homotopy type of polyhedra. The Čech expansion. — *Appendix 2: Borsuk's approach to shape*: Shape category of metric compacta. Shape category of compact metric pairs.

C. NASTASESCU and F. VAN OYSTAEYEN. — **Graded ring theory.** — North-Holland mathematical library, vol. 28. — Un vol. relié, 15,5 × 23, de ix, 340 p. — Prix: Dfl 100.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

*Some general techniques in the theory of graded rings*: Graded rings and modules. Some general techniques. *Commutative graded rings*: Some commutative algebra revisited. Arithmetically graded rings. Local conditions for Noetherian graded rings. — *Structure theory for graded rings of type  $Z$* : Non-commutative graded rings. — Filtered rings and modules.

**Selected papers of Kentaro Yano.** — Edited by Morio Obata. — North-Holland mathematics studies, vol. 70. — Un vol. broché, 16,5 × 24, de LIII, 363 p. — Prix: Dfl 125.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

Kentaro Yano — My old friend, by Shiing-shen Chern. Notes on my mathematical works, by Kentaro Yano. Bibliography of the publications of Kentaro Yano. — Les

espaces à connexion projective et la géométrie projective des « paths ». — Sur la théorie des espaces à connexion conforme. — On harmonic and Killing vector fields. — On  $n$ -dimensional Riemannian spaces admitting a group of motions of order  $\frac{1}{2}n(n-1) + 1$ . — On geometric objects and Lie groups of transformations (with N.H. Kuiper). — On invariant subspaces in an almost complex  $X_{2n}$  (with J. A. Schouten). — On real representations of Kaehlerian manifolds (with I. Mogi). — A class of affinely connected spaces (with H. C. Wang). — Einstein spaces admitting a one-parameter group of conformal transformations (with T. Nagano). — Harmonic and Killing vector fields in compact orientable Riemannian spaces with boundary. — Projectively flat spaces with recurrent curvature (with Y. C. Wong). — On a structure defined by a tensor field  $f$  of type (1,1) satisfying  $f^3 + f = 0$ . — Prolongations of tensor fields and connections to tangent bundles, I: general theory (with S. Kobayashi). — Some results related to the equivalence problem in Riemannian geometry (with K. Nomizu). — Vertical and complete lifts from a manifold to its cotangent bundle (with E. M. Patterson). — Almost complex structures on tensor bundles (with A. J. Ledger). — Differential geometric structures on principal toroidal bundles (with D. E. Blair and G. D. Ludden). — Kaehlerian manifolds with constant scalar curvature whose Bochner curvature tensor vanishes (with S. Ishihara). — Notes on infinitesimal variations of submanifolds. — CR submanifolds of a complex space form (with A. Bejancu and M. Kon).

H. G. KAPER, C. G. LEKKERKERKER, J. HEJTMANEK. — **Spectral methods in linear transport theory.** — Operator theory: advances and applications, vol. 5. — Un vol. relié, 17 × 24, de XI, 345 p. — Prix: FS 52.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1982.

Transport theory. — Time-independent transport equations. — Model case: full-range theory. — Model case: half-range theory. — Factorization of operator-valued functions. — Boundary value problems. — Nonhermitian collision operators. — Nonhermitian coordinate operators. — Degenerate spectra. — Other generalizations. — Time-dependent transport equations. — Reactor problem. — Multiple scattering problem.

**Invariant subspaces and other topics.** — 6th international conference on operator theory, Timisoara and Herculane (Romania), June 1-11, 1981. — Edited by C. Apostol, R. G. Douglas, B. Sz.-Nagy, D. Voiculescu. — Managing editor: Gr. Arsene. — Operator theory: advances and applications, vol. 6. — Un vol. relié, 17 × 24, de 229 p. — Prix: FS 48.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1982.

The book consists of a careful selection of papers in operator theory and related fields. Presented are original results of new research in fast developing areas. Several papers deal with invariante subspace problems or with the role of invariant subspaces in the study of linear operators on functional spaces. Other papers concern dilation theory, decomposable operators, operator algebras,... etc.

W. G. DIXON. — **Special relativity: the foundation of macroscopic physics.** — Un vol. broché, 15 × 22,5, de X, 261 p. — Prix: £9.95. — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1982.

The physics of space and time. — Affine spaces in mathematics and physics. — Foundations of dynamics. — Relativistic simple fluids. — Electrodynamics of polarizable fluids. — Vector and dyadic notation in three dimensions.

Robert VICHNEVETSKY and John B. BOWLES. — **Fourier analysis of numerical approximations of hyperbolic equations.** — With a foreword by Garrett Birkhoff. — SIAM studies in applied mathematics, vol. 5. — Un vol. relié, 16 × 23,5, de xii, 140 p. — Prix: £13.00. — SIAM, Philadelphia, 1982.

Fourier analysis of the accuracy of semi-discretizations. — Higher order semi-discretizations. — Full discretizations. — Damping, diffusion and filtering. — Group velocity. — Time-Fourier transforms. — Fourier analysis and  $\mathcal{L}_2$ -norm of the global error. — Spectral methods. — Equations in two dimensions: anisotropy.

**Lie algebras and related topics.** — Proceedings of a conference held at New Brunswick, New Jersey, May 29-31, 1981. — Edited by D. Winter. — Lecture notes in mathematics, vol. 933. — Un vol. broché, 16,5 × 24, de vi, 236 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

*Georgia M. Benkart, J. Marshall Osborn*: Representations of rank one Lie algebras of characteristic  $p$ . — *Richard E. Block*: The classification problem for simple Lie algebras of characteristic  $p$ . — *Steven E. Bowser*: Normalizer towers in semisimple Lie algebras. — *Daniel J. Britten, Frank W. Lemire*: A classification of pointed  $A_n$ -modules. — *Igor B. Frenkel*: Representations of affine Lie algebras, Hecke modular forms and Korteweg-De Vries type equations. — *James F. Hurley*: A note on the centers of Lie algebras. — *Victor G. Kac*: Some problems on infinite dimensional Lie algebras and their representations. — *Irving Kaplansky*: Some simple Lie algebras of characteristic 2. — *James Lepowsky*: Affine Lie algebras and combinatorial identities. — *Arne Meurman*: An embedding of  $PSL(2,13)$  in  $G_2(C)$ . — *Dale H. Peterson*: Affine Lie algebras and theta-functions. — *Alvany Rocha-Caridi*: Resolutions of irreducible highest weight modules over infinite dimensional graded Lie algebras. — *John Schue*: Representations of Lie  $p$ -algebras. — *Earl J. Taft*: Noncommutative sequences of divided powers. — *Robert Lee Wilson*: Euclidean Lie algebras are universal central extensions. — *David J. Winter*: The fitting and Jordan structure of affine semigroups.

Nicolas SPALTENSTEIN. — **Classes unipotentes et sous-groupes de Borel.** — Lecture notes in mathematics, vol. 946. — Un vol. broché, 16,5 × 24, de ix, 259 p. — Prix: DM 33.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

This monograph is a study of unipotent classes in a reductive group  $G$  defined over an algebraically closed field and of the variety  $B_u$ , for  $u \in G$  unipotent, of all Borel subgroups of  $G$  normalized by  $u$ . The case where  $G$  is disconnected is also considered, and considerable attention is given to bad characteristics. The reader is expected to have a background in the theory of linear algebraic groups. That part of the classification of unipotent elements which is needed is reviewed in the first chapter, which also contains material on disconnected reductive groups. The main results on  $B_u$  are contained in a second chapter, together with some applications. The third chapter is an attempt to use the order relation between unipotent classes to describe their behavior under changes in characteristic. Some well-known results are also proved.

**Functional analysis.** — Proceedings of a conference held at Dubrovnik, Yugoslavia, November 2-14, 1981. — Edited by D. Butkovic, H. Kraljevic, and S. Kurepa. — Lecture notes in mathematics, vol. 948. — Un vol. broché, 16,5 × 24, de x, 239 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

*Heinz Langer*: Spectral functions of definitizable operators in Krein spaces. — *Svetozar Kurepa*: Semigroups and cosine functions. — *Dieter Lutz*: Strongly continuous operator cosine functions. — *Hrvoje Kraljevic*: Rank and index in Banach algebras. — *Olga Hadzic*: Fixed point theorems in not necessarily locally convex topological vector spaces. — *Alain Guichardet*: Introduction to Lie groups and their representations. — *Jørgen Hoffmann-Jørgensen*: Probability and geometry of Banach spaces. — *Davor Butkovic*: Completions and the null-completion of vector measures. — *Aljosa Volcic*: On some counterexamples in measure theory.

**Harmonic maps.** — Proceedings of the NSF-CBMS regional conference, held at Tulane University, New Orleans, December 15-19, 1980. — Ed. by R. J. Knill, M. Kalka, and H. C. J. Sealey. — Lecture notes in mathematics, vol. 949. — Un vol. broché, 16,4 × 24, de v, 158 p. — Prix: DM 24.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

*Bruce Bennett and Stephen S.-T. Yau*: Milnor number and classification of isolated singularities of holomorphic maps. — *Jean-Pierre Bourguignon*: Harmonic curvature for gravitational and Yang-Mills fields. — *D. Burns*: Harmonic maps from  $\mathbb{C}P^1$  to  $\mathbb{C}P^n$ . — *Alfred Gray*: Vector cross products, harmonic maps and the Cauchy Riemann equations. — *M. Kalka*: Harmonic maps in Kähler geometry and deformation theory. — *Franz W. Kamber and Philippe Tondeur*: Harmonic foliations. — *Piu-Fai Leung*: On the stability of harmonic maps. — *T. Nagano*: Stability of harmonic maps between symmetric spaces. — *J. H. Sampson*: On a class of harmonic maps. — *H. C. J. Sealey*: Harmonic diffeomorphisms of surfaces. — *Karen K. Uhlenbeck*: Equivariant harmonic maps into spheres.

**Advances in non-commutative ring theory.** — Proceedings of the 12th George H. Hudson Symposium held at Plattsburgh, U.S.A., April 23-25, 1981. — Edited by P. J. Fleury. — Lecture notes in mathematics, vol. 951. — Un vol. broché, 16,5 × 24, de v, 142 p. — Prix: DM 19.80. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

*Paul M. Cohn*: Torsion modules and the factorization of matrices. — *Carl Faith*: Subrings of self-injective and FPF rings. — *Carl Faith*: Embeddings modules in projectives: a report on a problem. — *John A. Beachy*: Maximal torsion radicals over rings with finite reduced rank. — *Robert F. Damiano and Zoltan Papp*: Stable rings with finite global dimension. — *John Dauns*: Sums of uniform modules. — *Yehiel Ilamed*: On central polynomials and algebraic algebras. — *Marsha Finkel Jones*: Flatness and  $f$ -projectivity of torsion-free modules and injective modules. — *Peter Malcolmson*: Construction of universal matrix localizations. — *Erna Nauwelaerts and Jan Van Geel*: Arithmetical Zariski central rings.

**Combinatorial mathematics IX.** — Proceedings of the 9th Australian conference on combinatorial mathematics held at the University of Queensland, Brisbane, Australia, August 24-28, 1981. — Edited by Elisabeth J. Billington, Sheila Oates-Williams, and Anne Penfold Street. — Lecture notes in mathematics, vol. 952. — Un vol. broché, 16,5 × 24, de xi, 443 p. — Prix: DM 55.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

*7 invited addresses by*: D. R. Breach. — Peter J. Cameron. — A. Gardiner. — W. L. Kocay. — Vera Pless. — Cheryl E. Praeger. — R. G. Stanton. — *20 contributed papers by*: David Billington. — Elisabeth J. Billington. — Elisabeth J. Billington and James M. Fitz-

Gerald. — Jeremy E. Dawson. — Peter Eades, L. Foulds and J. Giffin. — M. N. Ellingham. — H. M. Finucan. — D. A. Holton, B. D. McKay and M. D. Plummer. — J. A. Hoskins. — St. John G. Kettle. — C. Lam, L. Thiel and S. Swiercz. — Charles H. C. Little. — A. Marczyk and Z. Skupien. — K. L. McAvaney. — Peter J. Robinson. — Jennifer Seberry. — D. B. Skillicorn. — Anne Penfold Street and Robert Day. — Deborah J. Street. — Marta Sved.

Sudhakar G. PANDIT, Sadashiv G. DEO. — **Differential systems involving impulses.** — Lecture notes in mathematics, vol. 954. — Un vol. broché, 16,5 × 24, de VII, 102 p. — Prix: DM 19.80. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

Preliminaries. — Existence and uniqueness. — Stability and asymptotic equivalence. — Impulsive systems. — Lyapunov's second method.

**Iterative solution of nonlinear systems of equations.** — Proceedings of a meeting held at Oberwolfach, Germany, January 31-February 5, 1982. — Edited by R. Ansorge, Th. Meis, and W. Törnig. — Lecture notes in mathematics, vol. 953. — Un vol. broché, 16,5 × 24, de VII, 202 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

The subject of this meeting was the iterative solution of nonlinear systems of equations in general, with emphasis on three topics in particular: multigrid methods, monotone and interval arithmetic iterations, and applications in industrial practice. Several of the research papers included deal with questions of the effective use of multigrid methods even in bifurcation and other highly nonlinear problems. Others consider acceleration of monotone iterations. Finally, some contributions look at concrete numerical problems in aerodynamics and other fields of engineering.

F. BRACKX, R. DELANGHE and F. SOMMEN. — **Clifford analysis.** — Research notes in mathematics, vol. 76. — Un vol. broché, 17 × 25, de XII, 308 p. — Prix: £12.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1982.

Clifford algebras and modules. — Monogenic functions: general theory. — Spaces of monogenic functions. — Boundary values of monogenic functions and Fourier analysis on the sphere. — Transform analysis in Euclidean space.

H. J. W. ZIEGLER. — **Vector valued Nevanlinna theory.** — Research notes in mathematics, vol. 73. — Un vol. broché, 17 × 25, de XIII, 201 p. — Prix: £9.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1982.

Extension of the first main theorem of Nevanlinna theory and interpretation by Hermitian geometry. — Some quantities arising in the vector valued theory and their relation to Nevanlinna theory. — Generalization of the Ahlfors-Shimizu characteristic and its connection with Hermitian geometry. — Additional results of the elementary theory. — Extension of the second main theorem of Nevanlinna theory.

B. STRAUGHAN. — **Instability, nonexistence and weighted energy methods in fluid dynamics and related theories.** — Research notes in mathematics, vol. 74. — Un vol. broché, 17 × 25, de iv, 169 p. — Prix: £8.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1982.

This book presents an integrated account of modern developments in techniques for instability, nonexistence, stability and uniqueness in partial differential equations as applied to continuum mechanics, with particular emphasis on fluid dynamics.

A. VANDERBAUWHEDE. — **Local bifurcation and symmetry.** — Research notes in mathematics, vol. 75. — Un vol. broché, 17 × 25, de viii, 350 p. — Prix: £12.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1982.

Mathematical preliminaries. — Symmetry and the Liapunov-Schmidt method. — Perturbations of symmetric nonlinear equations. — Generic bifurcation and symmetry. — Symmetry and bifurcation at multiple eigenvalues. — Bifurcation problems with  $SO(2)$ -symmetry and Hopf bifurcation. — Symmetry and bifurcation near families of solutions.

B. M. LEVITAN and V.V. ZHIKOV. — **Almost periodic functions and differential equations.** — Translated by L. W. Longdon. — Un vol. relié, 16 × 24, de xii, 211 p. — Prix: £17.50. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1982.

Almost periodic functions in metric spaces. — Harmonic analysis of almost periodic functions. — Arithmetic properties of almost periods. — Generalisation of the uniqueness theorem ( $N$ -almost periodic functions). — Weakly almost periodic functions. — A theorem concerning the integral and certain questions of harmonic analysis. — Stability in the sense of Lyapunov and almost periodicity. — Favard theory. — The method of monotonic operators. — Linear equations in a Banach space (questions of admissibility and dichotomy). — The averaging principle on the whole line for parabolic equations.

Hervé REINHARD. — **Equations différentielles: fondements et applications.** — Collection « Mu-B ». — Un vol. broché, 16 × 24, de xiv, 446 p. — Prix: FF 135.00. — Gauthier-Villars, Paris, 1982.

Généralités. — Equations linéaires. — Analyse des systèmes linéaires. — Stabilité, théorie de Lyapunov. — Intégrales premières, équations aux dérivées partielles du 1<sup>er</sup> ordre. — Opérateurs linéaires, fonction de Green, équations intégrales, problème de Sturm-Liouville. — Développements en série. — Equations et solutions périodiques.

P. G. CIARLET. — **Introduction à l'analyse numérique matricielle et à l'optimisation.** — Collection « Mathématiques appliquées pour la maîtrise ». — Un vol. broché, 16 × 24, de xii, 279 p. — Prix: FF 110.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Rio de Janeiro, 1982.

*Analyse numérique matricielle*: Rappels et compléments sur les matrices. Généralités sur l'analyse numérique matricielle. Origine des problèmes de l'analyse numérique matricielle. Méthodes directes de résolutions de systèmes linéaires. Méthodes itératives

de résolution des systèmes linéaires. Méthodes de calcul des valeurs propres et des vecteurs propres. — *Optimisation* : Rappels et compléments de calcul différentiel, premières applications. Généralités sur l'optimisation, premiers algorithmes. Introduction à la programmation non linéaire. Programmation linéaire.

P. G. CIARLET, J.-M. THOMAS. — **Exercices d'analyse numérique matricielle et d'optimisation**. — Collection « Mathématiques appliquées pour la maîtrise ». — Un vol. broché, 16 × 24, de 141 p. — Prix: FF 70.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Rio de Janeiro, 1982.

Cet ouvrage vient compléter le livre de cours de P. G. CIARLET: « Introduction à l'analyse numérique matricielle et à l'optimisation », et contient des énoncés d'exercices de nature, de longueur et de difficultés très variées.

Didier DACUNHA-CASTELLE, Marie DUFLO. — **Probabilités et statistiques. Tome 1: problèmes à temps fixe**. — Collection « Mathématiques appliquées pour la maîtrise ». — Un vol. broché, 16 × 24, de XII, 214 p. — Prix: FF 95.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Rio de Janeiro, 1982.

Recensements. — Pile ou face. — Vocabulaire probabiliste de la théorie de la mesure, inventaire des outils utilisés. — Indépendance, statistique basée sur l'observation d'un échantillon. — Échantillons gaussiens, régression, analyse de la variance. — A quoi sert l'expérience? Espérance conditionnelle, chaîne de Markov, information. — Modèle statistique dominé et estimation. Décision statistique.

Didier DACUNHA-CASTELLE, Marie DUFLO. — **Exercices de probabilités et statistiques. Tome 1: problèmes à temps fixe**. — Collection « Mathématiques appliquées pour la maîtrise ». Un vol. broché, 16 × 24, de X, 188 p. — Prix: FF 70.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Rio de Janeiro, 1982.

Recensements et probabilités discrètes. — Pile ou face. — Modèle probabiliste. — Produit d'espaces mesurés, indépendance. — Lois gaussiennes. — Espérance conditionnelle. — Modèle statistique dominé et estimation. — Décision statistique. — Tables statistiques.

**Mathematical techniques of optimization, control and decision**. — Edited by J. P. Aubin, A. Bensoussan, I. Ekeland. — Annals of the C.E.R.E.M.A.D.E. — Un vol. relié, 16 × 24, de VIII, 212 p. — Prix: FS 54.00. — Birkhäuser, Basel/Boston/Stuttgart, 1981.

*J. P. Aubin* : General overview. — CONVEX ANALYSIS: *J. P. Aubin* : Variational principles for differential equations of elliptic, parabolic and hyperbolic type. — *N. Ghoussoub* : Convexity and differentiability in Banach spaces, state of the art. — PARTIAL DIFFERENTIAL EQUATIONS AND CONTROL: *G. M. Troianiello* : Some unilateral problems of the non-variational type. — *J. Frehse* : On the regularity of solutions to elliptic differential inequalities. — *A. Bensoussan* : A partial differential equation arising in the separation principle of stochastic control. — ORDINARY DIFFERENTIAL EQUATIONS AND CONTROL: *P. Bernhard* : From classical to modern signal processing, some aspects of the theory. — *J. Ortman*s : Singularités de champs hamiltoniens; lien avec l'existence de solutions

optimales en calcul des variations. — **NON-CONVEX PROGRAMMING**: *H. Th. Jongen*: A note on non-convex optimization. — **GAME THEORY**: *G. Laffond and H. Moulin*: Stability by threats and counterthreats in normal form games.

**Seminar on stochastic processes, 1981.** — Edited by E. Çinlar, K. L. Chung, R. K. Gettoor. — Progress in probability and statistics, vol. 1. — Un vol. relié, 16 × 24, de 242 p. — Prix: FS 34.00. — Birkhäuser, Boston/Basel/Stuttgart, 1981.

*K. L. Chung and K. M. Rao*: Feynman-Kac functional and the Schrödinger equation. — *R. K. Gettoor and M. J. Sharpe*: Two results on dual excursions. — *F. B. Knight*: Characterization of Lévy measures of inverse local times of gap diffusion. — *J. W. Pitman*: Lévy systems and path decompositions. — *A. O. Pittenger*: Regular birth and death times. — *Z. R. Pop-Stojanovic and K. M. Rao*: Some results on energy. — *J. Walsh and W. Winkler*: Absolute continuity and the fine topology. — *E. Çinlar and J. Jacod*: Representation of semimartingale Markov processes in terms of Wiener processes and Poisson random measures.

**F. G. FRIEDLANDER.** — **Introduction to the theory of distributions.** — Un vol. broché, 15 × 23, de vi, 157 p. — Prix: £6.95 (relié: £17.50). — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1982.

Test functions and distributions. — Differentiation, and multiplication by smooth functions. — Distributions with compact support. — Tensor products. — Convolution. — Distribution kernels. — Coordinate transformations and pullbacks. — Tempered distributions and Fourier transforms. — Plancherel's theorem and Sobolev spaces. — The Fourier-Laplace transform. — Appendix: Topological vector spaces.

**T. C. HU.** — **Combinatorial algorithms.** — Un vol. relié, 17 × 24, de x, 292 p. — Addison-Wesley publishing company, Reading, Mass./Menlo Park, Cal./London/Amsterdam/Don Mills, Ontario/Sydney, 1982.

Shortest paths. — Maximum flows. — Dynamic programming. — Backtracking. — Binary tree. — Heuristic and near optimum. — Matrix multiplication. — *NP*-complete.

**J. D. ACHENBACH, A. K. GAUTESEN and H. MCMAKEN.** — **Ray methods for waves in elastic solids: with applications to scattering by cracks.** — Un vol. relié, 16 × 24, de xi, 251 p. — Prix: £27.50. — Pitman advanced publishing program, Boston/London/Melbourne, 1982.

Introduction. — Wave propagation in elastic solids. — Integral relations and energy considerations. — Waves in a half-space. — Elastodynamic ray theory. — Diffraction of a plane wave by the edge of a semi-infinite crack. — Scattering by cracks in elastic solids. — Geometrical theory of diffraction. — Uniform COD theory.

**E. E. ROSINGER.** — **Nonlinear equivalence, reduction of PDEs to ODEs and fast convergent numerical methods.** — Research notes in mathematics, vol. 77. — Un vol. broché, 17 × 25, de xx, 247 p. — Prix: £10.95. — Pitman advanced publishing program, Boston/London/Melbourne, 1982.

*Stability characterization for the convergence of general nonlinear difference schemes*: The Lax-Richtmyer linear equivalence. A simple case of nonlinear equivalence. Nonlinear

equivalence for finite blow up time. Relative numerical smoothness and nonlinear equivalence. — *General methods for reducing PDEs to ODEs in the case of the existence of smooth solutions*: A direct method for reducing PDEs to ODEs in the case of the existence of smooth solutions. An indirect method of reducing PDEs to ODEs in the case of the existence of smooth solutions. — *Fast convergence method for general nonlinear numerical schemes*: Diagonally approximating fast convergent difference schemes. Diagonally approximating fast convergent spline solutions.

T. J. WILLMORE. — **Total curvature in Riemannian geometry.** — Ellis Horwood series in mathematics and its applications. — Un vol. relié, 16 × 24, de 168 p. — Prix: £15.00 (broché: £7.50). — Ellis Horwood limited, Chichester, and Halsted press, a division of John Wiley and Sons, New York/Brisbane/Chichester/Toronto, 1982.

Riemannian geometry. — The Gauss-Bonnet formula. — Total absolute curvature. — Tight immersions. — Total mean curvature. — Conformal volume.

**Encyclopedia of statistical sciences: volume 1: A to circular probable error, and volume 2: classification to eye estimate.** — Editors-in-chief: Samuel Kotz and Norman L. Johnson. — Associate editor: Campbell B. Read. — A Wiley-interscience publication. — 2 vol. reliés, 18,5 × 26, de x, 480 p. pour le vol. 1 et de viii, 613 p. pour le vol. 2. — Prix: £55.00. pour chacun des deux volumes. — John Wiley and Sons, New York/Chichester/Brisbane/Toronto/Singapore, 1982.

All users of statistics will turn to the *Encyclopedia of statistical sciences* as an essential reference work on statistical methods and their application to virtually all facets of human endeavor. No other source available provides such-in-depth, exhaustive coverage of the philosophical foundations, theoretical bases, and computational techniques of statistical methods in such a wide variety of contexts. The contributions were authored by some of the world's most distinguished statisticians and are entirely new and up-to-date. The entire encyclopedia is written in a language that non-specialist can easily follow. The encyclopedia covers all principal subfields of the statistical sciences, including probability theory, statistical distribution theory, computational methods, sampling survey methods, decision theory, sequential analysis, and multivariable analysis. It also deals with the application of statistics to many fields including: agriculture, computer programming, demography, game theory, engineering, the health sciences, psychology, business and economics, geography, the use of testing, anthropology, quantum mechanics, crystallography, census-taking, systems analysis, military methods... etc. The encyclopedia is planned as an eight volume set.

Martin GARDNER. — **Casse-tête dans le cosmos: 34 problèmes dans l'univers de la S. F.** — Préface d'Isaac Asimov. — Trad. de l'anglais par Agnès Szakonyi. — Un vol. relié, 15 × 21, de xii, 146 p. — Prix: FF 68.00. — Dunod, Paris, 1982.

C'est sous la constante invocation d'Isaac Asimov, grand maître incontesté de la science-fiction, que se déroulent ces 34 histoires de S. F. qui servent de décor à un nombre plus important encore de casse-tête logiques. Martin Gardner propose ici, des « problèmes à ricochets », une réponse rebondissant parfois pour donner lieu à une nouvelle question. Les problèmes s'appuient sur des considérations relevant des diverses branches des mathématiques, géométrie, algèbre, arithmétique, probabilités, topologie, et parfois de la physique.

EUREKA. — **Récréations mathématiques: 200 casse-tête moins un.** — Un vol. relié, 15 × 21, de VIII, 152 p. — Prix: FF 68.00. — Dunod, Paris, 1982.

Voici 199 casse-tête, qui, astucieusement mis en scène dans de courtes anecdotes, constituent autant de divertissantes récréations... mathématiques. Eurêka, alias Marie Berrondo, qui enseigne les mathématiques et la statistique dans une université parisienne, est l'auteur de ces récréations dont la plupart ont fait l'objet d'une première publication dans l'hebdomadaire « Valeurs actuelles ».

Reint de BOER. — **Vektor- und Tensorrechnung für Ingenieure.** — Hochschultext. — Un vol. broché, 17 × 24, de IX, 260 p. — Prix: DM 38.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

Dieses Lehrbuch behandelt die Vektor- und Tensorrechnung weitgehend in absoluter, koordinatenfreier Darstellung, die in wissenschaftlichen Publikationen bevorzugt verwendet wird. Es beinhaltet darüber hinaus eine Einführung in die Kontinuums-mechanik und Ausführungen über die lineare Schalentheorie. Das Werk schliesst damit eine Lücke zwischen den Ingenieurwissenschaften und der angewandten Mathematik. Es ist gedacht für Studenten und Ingenieure des konstruktiven Ingenieurwesens, für Physiker und angewandte Mathematiker. Das Buch enthält zahlreiche Beispiele und über 130 Übungsaufgaben und Lösungen.

Gérard HIRSCH, Jocelyne ROUYER. — **Intégrales simples.** — Avec la collaboration de Joseph Royer. — 2<sup>e</sup> édition. — Collection « Comprendre et appliquer »: mathématiques pratiques et élémentaires, vol. 2. — Un vol. broché, 18 × 24, de VIII, 56 p. — Prix: FF 56.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Rio de Janeiro, 1982.

L'objectif dans ce livre est la résolution de toutes les intégrales simples. Dans ce but, les définitions et théorèmes sont rappelés et commentés brièvement. Des « exercices-exemples » spécifiques à chaque cas et de difficulté croissante, doivent permettre l'acquisition des techniques de calcul.

N. BOURBAKI. — **Eléments de mathématique: groupes et algèbres de Lie, chapitre 9: groupes de Lie réels compacts.** — Un vol. broché, 17 5 × 24, de 144 p. — Prix: FF 120.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Rio de Janeiro, 1982.

Algèbres de Lie compactes. — Tores maximaux des groupes de Lie compacts. — Formes compactes des algèbres de Lie semi-simples complexes. — Système de racines associé à un groupe compact. — Classes de conjugaison. — Intégration dans les groupes de Lie compacts. — Représentations irréductibles des groupes de Lie compacts connexes. — Transformation de Fourier. — Opérations des groupes de Lie compacts sur les variétés. — Structure des groupes compacts. — Représentations de type réel, complexe ou quaternionien. — Exercices.

A. G. HAMILTON. — **Numbers, sets and axioms: the apparatus of mathematics.** — Un vol. broché, 16 × 23, de IX, 255 p. — Prix: £9.50 (relié: £25.00). — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1982.

*Numbers*: Natural numbers and integers. Rational numbers. Real numbers. Decimal notation. — *The size of a set*: Finite and countable sets. Uncountable sets. Cardinal

numbers. — *Ordered sets*: Order relations and ordered sets. Lattices and Boolean algebras. — *Set theory*: What is a set? The Zermelo-Fraenkel axioms. Mathematics in ZF. Sets and classes. Models of set theory. — *The axiom of choice*: The axiom and direct applications. Zorn's lemma and the well-ordering theorem. Other consequences of the axiom of choice. — *Ordinal and cardinal numbers*: Well-ordered sets and ordinal numbers. Transfinite recursion and ordinal arithmetic. Cardinal numbers. — *Hints and solutions to selected exercises*.

**Computing methods in applied sciences and engineering, V.** — Proceedings of the 5th international symposium on computing methods in applied sciences and engineering, Versailles, France, December 14-18, 1981. — Edited by R. Glowinski and J. L. Lions. — Un vol. relié, 16 × 23, de x, 668 p. — Prix: Dfl 240.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1982.

More than 350 scientists and engineers from 22 countries attended this meeting during which particular attention was given to some new, and important topics such as parallel computing, modelling and numerical simulation of turbulence, nonlinear elasticity. The other topics were: numerical algebra, stiff differential equations, approximation of eigenvalues and eigenfunctions bifurcation, wave propagation, fluid mechanics, plasma physics, semiconductors, biomathematics, inverse problems.

E. Tamas SCHMIDT. — **A survey on congruence lattice representations.** — Teubner-Texte zur Mathematik, Bd. 42. — Un vol. broché, 15 × 21, de 115 p. — M 12.00. — B. G. Teubner Verlagsgesellschaft, 1982.

*First concepts*: Algebraic lattices. Ideals of semilattices. Closure operators. Equivalence relations. Algebraic lattices and join-homomorphism. Free Boolean algebra. — *Congruence relations of algebras*: Basic properties of congruences. Extension of congruences. Congruence lattices. Algebras of fixed similarity type. Congruence lattices of semigroups. Congruences of finite algebras. Modular congruence lattices and  $n$ -permutability. — *Congruences of lattices*: Congruence relations and weak projectivity. Congruences and ideals. Finite distributive lattices are congruence lattices. Weak projectivities in modular lattices. Congruence lattices of modular lattices. Distributive congruences of semilattices. Pre-skeleton. Proof of the main theorem. — *Appendix*: Congruence lattices of other algebras.

Hartmut HECKENDORFF. — **Grundlagen der sequentiellen Statistik.** — Teubner-Texte zur Mathematik, Bd. 45. — Un vol. broché, 15 × 21, de 166 p. — M 18.00. — B. G. Teubner Verlagsgesellschaft, 1982.

Im vorliegenden Text wird ein systematischer Zugang zur Darstellung der Grundlagen der Theorie des sequentiellen statistischen Experiments erarbeitet. Dieser Zugang beinhaltet die für die Anwendung stets gleichermassen bedeutsamen Aspekte der Festlegung der Strategie der Versuchsplanung, des Umfangs des Experiments sowie der auf den entstehenden Stichprobenräumen basierenden Entscheidungsregeln. Dabei wird der gerade im sequentiellen Fall besonders relevanten Nutzung des Prinzips der Suffizienz besondere Aufmerksamkeit gewidmet. Ferner wird die sequentielle Bayessche Entscheidungstheorie in gewisser Gründlichkeit eingeordnet. Die Theorie der sequentiellen Versuchsplanung wird für die Aufgabe des zweiarmigen Banditen und für das Regressionsproblem spezifiziert.

**Die Werke von Daniel Bernoulli: Band 2: Analysis, Wahrscheinlichkeitsrechnung.** — Bearbeitet und kommentiert von L. P. Bouckaert und B. L. van der Waerden, unter Benützung von Vorarbeiten von H. Straub. — Im Auftrag der Naturforschenden Gesellschaft Basel und der Otto-Spiess-Stiftung. — Ediert von David Speiser. — Die gesammelten Werke der Mathematiker und Physiker der Familie Bernoulli (Sammlung). — Un vol. relié, 20 × 27, de 403 p. — Prix: FS 120.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1982.

Mit dem vorliegenden Band beginnt die Ausgabe der gesammelten Werke Daniel Bernoullis. Für diese Werkausgabe (ohne Briefe) sind insgesamt 8 Bände vorgesehen, deren Druck in den nächsten Jahren geplant ist. Dieser Band, der zweite der Reihe, enthält Daniel Bernoullis spätere Schriften zur Mathematik. Sie gehören zu etwa gleichen Teilen zur Analysis und zur Wahrscheinlichkeitsrechnung. Die erste Gruppe (Analysis) ist eingeleitet und herausgegeben von L. P. Bouckaert, Löwen. Diese Arbeiten befassen sich vor allem mit rekurrenten Reihen, trigonometrischen Reihen und Kettenbrüchen. Bernoullis Arbeiten zu den trigonometrischen Reihen hängen mit seinen Arbeiten auf dem Gebiete der Elastizitätstheorie (Band 6) zusammen. Die zweite Gruppe (Wahrscheinlichkeitsrechnung) ist eingeleitet von B. L. van der Waerden, Zürich. In seiner ersten Arbeit, der einzigen, die er in seinen Jugendjahren verfasste, führt Bernoulli, um das „Petersburger Paradoxon“ zu erledigen, den Begriff der „moralischey Erwartung“ ein. Die späten Arbeiten gelten vor allem praktischen Fragen der Wahrscheinlichkeitsrechnung. Er wendet sie auf die Bevölkerungsstatistiken an, untersucht den möglichen Nutzen der Impfung u.a. In der letzten Arbeit versucht er ein universelles Fehlergesetz zu bestimmen.

**Ternary quadratic forms and norms.** — Edited by Olga Taussky. — Lecture notes in pure and applied mathematics series, vol. 79. — Un vol. broché, 18 × 26, de vii, 135 p. — Prix: FS 60.00. — Marcel Dekker, Inc., New York/Basel, 1982.

*Hershy Kisilevsky*: The Redei-Reichardt theorem: another proof. — *Wilhelm Plesken*: Automorphs of ternary quadratic forms. — *Hans Peter Rehm*: On a theorem of Gauss concerning the number of integral solutions of the equation  $x^2 + y^2 + z^2 = m$ . — *Olga Taussky*: Two facts concerning rational  $2 \times 2$  matrices leading to integral ternary forms representing zero. — *B. L. van der Waerden*: On the 1st and 2nd quadratic form. — *Alfred Weiss*: Characteristics polynomials of symmetric matrices. — *Hans J. Zassenhaus*: Gauss' theory of ternary quadratic forms, an example of the theory of homogeneous forms in many variables, with applications.

**Volterra and functional differential equations.** — Edited by Kenneth B. Hannsgen, Terry L. Herdman, Harlan W. Stech, Robert L. Wheeler. — Lecture notes in pure and applied mathematics, vol. 81. — Un vol. broché, 18 × 26, de xii, 333 p. — Prix: FS 135.00. Marcel Dekker, Inc., New York/Basel, 1982.

This timely book unites the work of 31 distinguished, international contributors to the 1981 conference on Volterra and functional differential equations held at Virginia Polytechnic Institute and State University in Blacksburgh. Researchers, mathematicians, and computer scientists engaged in the study of ordinary, partial, or functional differential equations; or Volterra integral and integrodifferential equations will welcome this volume as a vital reference of current knowledge on the subject as well as an indispensable guide to applying these equations in their own work.

**Nonlinear partial differential equations and their applications, Collège de France Seminar, volume II.** — Edited by H. Brezis and J. L. Lions. — Coordinated by D. Cioranescu. — Research notes in mathematics, vol. 60. — Un vol. broché,  $17 \times 25$ , de x, 398 p. — Prix : £12.75. — Pitman advanced publishing program, Boston/London/Melbourne, 1982.

This book contains the texts of selected lectures delivered at a weekly seminar held at the Collège de France. It includes contributions by leading experts from various centres on recent results in nonlinear functional analysis and partial differential equations. The emphasis is laid on applications to numerous fields including control theory, theoretical physics, fluid mechanics, free boundary value problems, dynamical systems, numerical analysis and engineering. The book will be of particular interest to postgraduate students and specialists in these areas.

David B. GAULD. — **Differential topology: an introduction.** — Monographs and textbooks in pure and applied mathematics, vol. 72. — Un vol. relié,  $16 \times 24$ , de v, 241 p. — Prix: FS 89.00. — Marcel Dekker, Inc., New York/Basel, 1982.

What is topology? — Topological spaces. — Some topological properties. — Some advanced calculus. — Differentiable manifolds. — Orientability. — Submanifolds and an embedding theorem. — Tangent spaces. — Critical points again. — Vector fields and integral curves. — Surgery. — The trace of a surgery. — Surgery on a surface. — Classification of orientable surfaces. — Whitney's embedding theorem. — The unproved theorems and further topics.

F. LANGOUCHE, D. ROEKAERTS and E. TIRAPEGUI. — **Functional integration and semiclassical expansions.** — Mathematics and its applications, vol. 10. — Un vol. relié,  $16 \times 23$ , de xii, 313 p. — D. Reidel publishing company, Dordrecht/Boston/London, 1982.

Functional integrals defined as limits of discretized expressions. — Correspondence rules and functional integral representations. — Functional integral representations of expectation values. Time-ordered products. — Perturbation expansions. — Short time propagators and the relations between them. — Covariant definitions of functional integrals. — Functional integral methods in Fokker-Planck dynamics. — Product integrals. — The semiclassical expansion in phase space. — The semiclassical expansion in configuration space. — Other approaches. — Computation of the propagator on the sphere  $S^3$ .

Walter FELSCHER — **Naive Mengen und abstrakte Zahlen III: transfiniten Methoden.** — Un vol. broché,  $14 \times 21$ , de 270 p. — Prix: DM 25.80. — Bibliographisches Institut, Mannheim/Wien/Zürich, 1979.

Die Entdeckungen Cantor's. — Wohlordnungen und Ordinalzahlen. — Ordinalzahlarithmetik. — Anwendungen der Ordinalzahlarithmetik. — Wohlordnungen der natürlichen Zahlen. — Fundierte Mengen. — Mächtigkeiten und Kardinalzahlen. — Das Auswahlaxiom. — Die Elimination der transfiniten Zahlen und die Konstruktion wohlgeordneter Mengen. — Mengenlehre als Beweisprinzip.

Daniel LEHMANN, Carlos SACRE. — **Géométrie et topologie des surfaces.** — Collection « Mathématiques ». — Un vol. broché, 15 × 22, de 348 p. — Prix: FF 135.00. — Presses universitaires de France, Paris, 1982.

Surfaces topologiques et différentiables. — Fonctions différentiables, vecteurs tangents et champs de vecteurs sur une surface  $C^\infty$ . — Chaînes singulières différentiables, formes différentielles et intégration sur une surface. — Géométrie riemannienne des surfaces. — Pavages, homologie entière et cohomologie réelle d'une surface compacte. — L'invariant d'Euler-Poincaré d'une surface compacte.

Edwin DIDAY, Jacques LEMAIRE, Jean POUGET, Françoise TESTU. — **Éléments d'analyse de données.** — Dunod décision. — Un vol. broché, 16 × 24, de xv, 462 p. — Dunod, Paris, 1982.

*Les étapes préliminaires à une analyse de données*: Modélisation de la notion d'individu et de variables. Tableaux de données. Éléments descriptifs d'un tableau de données. Le changement de variable. Choix d'une mesure de ressemblance. — *Classification automatique*: Principes généraux. La classification par hiérarchie et par arbre. La classification par partitions. — *Les méthodes linéaires*: Régression linéaire. Analyse factorielle. — *Analyse discriminante*: Forme des données, notation, éléments descriptifs. Buts des méthodes. Critère de décision, règle de décision ou d'affectation associée à un critère de décision. Problèmes de réductibilité, élimination de variables. Tests statistiques utilisés en analyse discriminante. Généralités sur les méthodes d'analyse discriminante sur variables qualitatives. Exemples. — *Méthodes ordinales*: Exemples de données ordinales. Relations sur un ensemble fini. Codage d'une relation (floue) de préférence. Représentation euclidienne de données de préférence. Agrégation de données de préférence. — Exercices à la fin de chaque chapitre.

G. LETAC. — **Intégration et probabilités, analyse de Fourier et analyse spectrale: exercice.** — Collection « Maîtrise de mathématiques pures ». — Un vol. broché, 16 × 24, de 152 p. — Prix: FF 60.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Rio de Janeiro, 1982.

Espaces mesurables et fonctions intégrables. — Mesures Boréliennes et mesures de Radon. — Analyse de Fourier. — Méthodes Hilbertiennes et théorèmes limite en calcul des probabilités. — Errata d'« Intégration et probabilités, analyse de Fourier et analyse spectrale », livre de cours, par P. Malliavin.

Michael OBERGUGGENBERGER. — **Der Graphensatz in lokalkonvexen topologischen Vektorräumen.** — Teubner-Texte zur Mathematik, Bd. 44. — Un vol. broché, 15 × 21, de 148 p. — Prix: M 15.50. — B. G. Teuber Verlagsgesellschaft, Leipzig, 1982.

Grundlagen. — Die klassische Theorie. — Anwendungen von Graphensätzen. — Tonnelierte Räume. — Die Ptaksche Theorie. — Finale Eigenschaften. — Die De Wildesche Theorie. — Maximale Graphensätze. — Zusammenfassung.

Heinrich RENELT. — **Quasikonforme Abbildungen und elliptische Systeme.** — Teubner-Texte zur Mathematik, Bd. 46. — Un vol. broché, 15 × 21, de 140 p. — Prix: M. 14.50. — B. G. Teubner Verlagsgesellschaft, Leipzig, 1982.

Hilfsmittel aus der Analysis. — Quasikonforme Abbildungen und Lösungen Beltrami-scher Differentialgleichungssysteme. — Elliptische Differentialgleichungssysteme erster

Ordnung in der Ebene. — Einige funktionentheoretische Eigenschaften der  $(\nu, \mu)$ -Lösungen. — Integraltransformationen und Fundamentallösungen. — Integralformeln für  $(\nu, \mu)$ -Lösungen. — Variationsmethoden für schlichte  $(\nu, \mu)$ -Lösungen.

**Equadiff 5.** — Proceedings of the 5th Czechoslovak conference on differential equations and their applications held in Bratislava, August 24th to 28th, 1981. — Edited by Michal Gregus. — Teubner-Texte zur Mathematik, Bd. 47. — Un vol. broché,  $15 \times 21$ , de 396 p. — Prix: M. 39.00. — B. G. Teuber Verlagsgesellschaft, Leipzig, 1982.

The conference was attended by 190 participants from Czechoslovakia and 210 participants from all over the world. The scientific program of the conference comprised 12 invited addresses, 77 invited lectures and 155 scientific communications. This volume contains the texts of plenary addresses and of invited lectures which were held in four sections: ordinary differential equations, partial differential equations, numerical methods of differential equations, applications of differential equations.

**Seminar D. Eisenbud/B. Singh/W. Vogel, vol. 2.** — Teubner-Texte zur Mathematik, Bd. 48. — Un vol. broché,  $15 \times 21$ , de 108 p. — Prix: M. 14.00. — B. G. Teubner Verlagsgesellschaft, 1982.

This seminar aims at speedy, informal, and high level information on new developments in pure mathematics, especially in commutative algebra and algebraic geometry. Considered for publication are original papers and seminar reports given at Brandeis university, Waltham, Mass., U.S.A., Tata institute of fundamental research, Bombay, India, or Martin-Luther-university, Halle, GDR.

**Nonlinear analysis, function spaces and applications, vol. 2.** — Proceedings of the Spring school held in Pisek, 1982. — Edited by Oldrich John and Alois Kufner. — Teubner-Texte zur Mathematik, Bd. 49. — Un vol. broché,  $15 \times 21$ , de 268 p. — Prix: M. 27.00. — B. G. Teubner Verlagsgesellschaft, 1982.

*V. I. Burenkov*: Mollifying operators with variable step and their application to approximation by infinitely differentiable functions. — *M. Giaquinta*: On differentiability of the extremals of variational integrals. — *K. P. Hadeler*: Nonlinear differential equations from biology. — *P. L. Lions*: Fully nonlinear elliptic equations and applications. — *V. G. Maz'ya*: Theory of multipliers in spaces of differentiable functions and its applications. — *I. V. Skrypnik*: Topological methods of investigation of operator equations and nonlinear boundary value problems. — *J. R. L. Webb*: Approximation solvability of nonlinear equations. — *T. M. Rassias*: The influence of topology to non-linear analysis.

**Conference on harmonic analysis in honor of Antoni Zygmund.** — Proceedings of a conference at the University of Chicago, March 23-28, 1981. — Edited by William Beckner, Alberto P. Calderon, Robert Fefferman, Peter W. Jones. — The Wadsworth mathematics series. — 2 vol. reliés,  $18 \times 24$ , de 880 p. — Prix: \$107.95. — Wadsworth international group, Belmont, California, 1983.

Introductory paper by E. M. Stein. — TRIGONOMETRIC SERIES: 7 exposés par W. Beckner, S. Janson, and D. S. Jerison. — G. Gasper. — G. Halász and H. L. Montgomery. — J.-P. Kahane. — S. K. Pichorides. — M. H. Taibleson and G. Weiss. — M. Zafran. — FOURIER ANALYSIS ON  $\mathbb{R}^n$  AND REAL ANALYSIS: 8 exposés par A. E. Gatto, C. E. Gutiérrez, and R. L. Wheeden. — R. R. Gundy. — R. A. Hunt and D. S. Kurtz. — R. A. Hunt, D. S. Kurtz, and C. J. Neugebauer. — M. Jodeit, Jr. — B. Muckenhoupt. — A. Ruiz. —

T. Walsh. — SINGULAR INTEGRALS AND PSEUDODIFFERENTIAL OPERATORS: 8 exposés par R. Arocena and M. Cotlar. — D. L. Burkholder. — R. R. Coifman, A. McIntosh, and Y. Meyer. — A. Cordoba. — M. Cotlar and C. Sadosky. — R. Fefferman. — D. H. Phong and E. M. Stein. — D. F. Shea and S. Wainger. — HARDY SPACES: 9 exposés par L. Carleson. — S.-Y.A. Chang. — A. E. Gatto, J. R. Jimenez, and C. Segovia. — J. E. Gilbert, R. A. Kunze, R. J. Stanton, and P. A. Tomas. — P. W. Jones. — U. Neri. — D. Sarason. — J.-O. Strömberg. — A. Uchiyama. — DIFFERENTIATION THEORY: 4 exposés par S. Chanillo and R. L. Wheeden. — M. de Guzmán. — A. Nagel, W. Rudin, and J. H. Shapiro. — G. V. Welland. — PARTIAL DIFFERENTIAL EQUATIONS: 7 exposés par M. Cwikel, E. B. Fabes, and C. E. Kenig. — E. B. Fabes, D. S. Jerison, and C. Kenig. — C. Fefferman and D. H. Phong. — D. Gurarie and M. A. Kon. — L. I. Hedberg. — J. E. Lewis and C. Parenti. — B. Marshall. — OTHER TOPICS RELATED TO HARMONIC ANALYSIS: 14 exposés par R. Beals and R. R. Coifman. — J. Burbea. — A. P. Calderón. — C. F. Dunkl. — M. R. Herman. — Y. Meyer. — S. Janson. — P. Koosis. — H. P. Lotz, N. T. Peck, and H. Porta. — P. Malliavin. — H. N. Mhaskar. — Y. Sagher. — A. L. Shields. — N. T. Varopoulos.

Eric S. LANDER. — **Symmetric designs: an algebraic approach.** — London mathematical society lecture notes series, vol. 74. — Un vol. broché, 15 × 23, de XII, 306 p. — Prix: £15.00. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1983.

*Symmetric designs*: Definitions and simple examples. Hadamard matrices and designs. Projective geometries.  $t$ -designs. Dembrowski-Wagner theorem. — *An algebraic approach*: Existence criteria. The code and the module of a symmetric design. — *Automorphisms*: Fixed points and blocks. Doubly-transitive symmetric designs. Automorphisms of prime order. Counting orbits. — *Difference sets*: Abelian difference sets. Contracting difference sets.  $G$ -matrices. Difference sets with multiplier  $-1$ . Cyclic groups are special. More on cyclic groups. — *Multiplier theorems*: The automorphism theorem. Contracted automorphism theorem. Blocks fixed by multipliers. Further multiplier theorems. — *Open questions*: Existence. Cyclic Sylow subgroups. Cyclic projective planes. Multiplier theorems Tables. — *Appendices*: Permutation groups. Bilinear and quadratic forms. Invariant factors. Representation theory. Cyclotomic fields.  $P$ -adic numbers.

Peter C. FISHBURN. — **The foundations of expected utility.** — Theory and decision library: an international series in the philosophy and methodology of the social and behavioral sciences, vol. 31. — Un vol. relié, 16 × 23, de XII, 176 p. — Prix: Dfl 95.00. — D. Reidel publishing company, Dordrecht/Boston, 1982.

*Expected utility*: Linear utility on mixture sets. Expected utility for probability measures. Lexicographic quasilinear utility. Linear utility for partially ordered preferences. Linear utilities on product sets. Multilinear utility on products of mixture sets. Multilinear utility for probability measures. — *Subjective expected utility*: Subjective linear utility on products of mixture sets. Subjective expected utility for arbitrary state sets, and for partially ordered preferences. Subjective linear utility with conditional preference comparisons.

YASUO MURATA. — **Optimal control methods for linear discrete-time economic systems.** — Un vol. relié, 16 × 25, de X, 202 p. — Prix: DM 85.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

Macroeconomic policies and instrument instability. — Optimal control of linear discrete-time systems. — Observers for linear discrete-time systems. — Filters for linear

stochastic discrete-time systems. — Optimal control of linear stochastic discrete-time systems. — Stabilization of economic systems under the government budget constraint. — Differentials of matrix traces.

K. C. MOSLER. — **Entscheidungsregeln bei Risiko: multivariate stochastische Dominanz.** — Lecture notes in economics and mathematical systems, vol. 204. — Un vol. broché, 17 × 25, de VII, 172 p. — Prix: DM 35.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

Die vorliegende Monographie behandelt die Theorie der stochastischen Dominanz für univariate und multivariate Prospekte sowie für Prospekte in allgemeineren Räumen; für eine grosse Anzahl ökonomisch relevanter Nutzenklassen werden notwendige und hinreichende Bedingungen dafür hergeleitet, dass ein Prospekt einen anderen Prospekt dominiert. Der abschliessende Anwendungsteil enthält durchgerechnete Beispiele und Hinweise auf weitere Anwendungen in der Stochastik und im Operations Research.

Ramu RAMANATHAN. — **Introduction to the theory of economic growth.** — Lecture notes in economics and mathematical systems, vol. 205. — Un vol. broché, 17 × 25, de IX, 347 p. — Prix: DM 52.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

Review of production functions and their properties. — Basic neo-classical growth models. — Technical progress. — Money and economic growth. — Neo-classical models with two income classes. — Cambridge growth models. — The speed of adjustment in growth models. — Optimal growth. — Two sector growth models. — International trade and economic growth. — Review questions.

Y. FUJIMORI. — **Modern analysis of value theory.** — Lecture notes in economics and mathematical systems, vol. 207. — Un vol. broché, 17 × 25, de X, 165 p. — Prix: DM 30.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1982.

Marx's theory of value, price and growth in a Leontief economy. — Fixed capital and the theory of value. — Marx-von Neumann's theory of value. — Reduction of heterogeneous labour. — Fundamental analysis of differential rent.

Des F. NICHOLLS, Barry G. QUINN. — **Random coefficient autoregressive models: an introduction.** — Lecture notes in statistics, vol. 11. — Un vol. broché, 16 × 24, de V, 154 p. — Prix: DM 26.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

Introduction. — Stationarity and stability. — Least squares estimation of scalar models. — Maximum likelihood estimation of scalar models. — A Monte Carlo study. — Testing the randomness of the coefficients. — The estimation of multivariate models. — An application.

Martin JACOBSEN. — **Statistical analysis of counting processes.** — Lecture notes in statistics, vol. 12. — Un vol. broché, 16 × 24, de VII, 226 p. — Prix: DM 38.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

*One-dimensional counting processes*: Probabilities on  $(0, \infty]$ . Definition. Construction of canonical counting processes. Intensities, martingale decompositions, for canonical counting processes. Statistical models and likelihood ratios. — *Multivariate counting*

*processes*: Definition and construction. Intensities and martingale representations. Products of canonical counting processes. Likelihood ratios. Discrete counting processes. — *Stochastic integrals*: Processes and martingales on  $W^E$ . Definition and basic properties. — *The multiplicative intensity model*: Definition of the full Aalen model. Product models and sufficient reductions. Estimation in the Aalen model. Estimation in Markov chains. The Cox regression model. Maximum-likelihood estimation in Aalen models. — *Asymptotic theory*: A limit theorem for martingales. Asymptotic distributions of Aalen estimators, of product-limit estimators. Comparison of two intensities. — *Appendix*: The principle of repeated conditioning. Weak convergence. — Exercices à la fin de chaque chapitre.

J. PFANZAGL. — **Contributions to a general asymptotic statistical theory.** — With the assistance of W. Wefelmeyer. — Lecture notes in statistics, vol. 13. — Un vol. broché, 16 × 24, de vii, 315 p. — Prix: DM 44.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

Introduction. — The local structure of families of probability measures. — Examples of tangent spaces. — Tangent cones. — Differentiable functionals. — Examples of differentiable functionals. — Distance functions for probability measures. — Projections of probability measures. — Asymptotic bounds for the power of tests. — Asymptotic bounds for the concentration of estimators. — Existence of asymptotically efficient estimators for probability measures. — Existence of asymptotically efficient estimators for functionals. — Existence of asymptotically efficient tests. — Inference for parametric families. — Random nuisance parameters. — Inference for symmetric probability measures. — Inference for measures on product spaces. — Dependence-independence. — Two-sample problems.

**GLIM 82.** — Proceedings of the international conference on generalised linear models. — Edited by Robert Gilchrist. — Lecture notes in statistics, vol. 14. — Un vol. broché, 16 × 24, de vi, 188 p. — Prix: DM 29.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

*J. A. Nelder*: Introduction. — *R. J. Baker*: PRISM, an overview. — *M. R. B. Clarke*: GLIM4, the new facilities. — *M. Green*: Array manipulation in prism. — *M. Slater*: The graph module. — *R. W. Payne*: AOV, the PRISM module for analysing designed experiments. — *P. J. Green*: The APL alternative. — *M. Aitkin*: Direct likelihood inference. — *D. Pregibon*: Score tests in GLIM. — *J. Whittaker*: GLIM syntax and simultaneous tests for graphical log linear models. — *J. Hinde*: Compound Poisson regression models. — *A. J. Scallan*: Some aspects of parametric link functions. — *A. Ekholm and J. Palmgren*: A model for a binary response with misclassifications. — *R. Burn*: Loglinear models with composite link functions in genetics. — *K. Phelps*: Use of the complementary log-log function to describe dose-response relationships in insecticide evaluation field trials. — *C. D. Sinclair*: GLIM for preference.

Donald J. NEWMAN. — **A problem seminar.** — Problem books in mathematics. — Un vol. broché, 16 × 24, de vii, 113 p. — Prix: DM 35.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

This book has three parts: first, the list of problems, briefly punctuated by some descriptive pages (on estimation theory, generating functions, limits of integrals, expectations, prime factors, category arguments, convexity); second, a list of hints, which are

merely meant as words to the (very) wise; and third, the (almost) complete solutions. Thus, the problems can be viewed on any of three levels: as somewhat difficult challenges (without the hints), as more routine problems (with the hints), or as a textbook on "how to solve it" (when the solutions are read).

TOSIO KATO. — **A short introduction to perturbation theory for linear operators.** — Un vol. relié, 16 × 24, de XIII, 161 p. — Prix: DM 49.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

*Operator theory in finite-dimensional vector spaces*: Vector spaces and normed vector spaces. Linear forms and the adjoint space. Linear operators. Analysis with operators. The eigenvalue problem. Operators in unitary spaces. Positive matrices. — *Perturbation theory in a finite-dimensional space*: Analytic perturbation of eigenvalues. Perturbation series. Convergence radii and error estimates. Similarity transformations of the eigenspaces and eigenvectors. Non-analytic perturbations. Perturbation of symmetric operators. Perturbation of (essentially) nonnegative matrices.

YU. A. ROZANOV. — **Markov random fields.** — Translated by Constance M. Elson. — Un vol. relié, 16 × 24, de IX, 201 p. — Prix: DM 108.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1982.

*General facts about probability distributions*: Probability spaces. Conditional distributions. Zero-one laws. Regularity. Consistent conditional distributions. Gaussian probability distributions. — *Markov random fields*: Basic definitions and useful propositions. Stopping  $\sigma$ -algebras. Random sets and the strong Markov property. Gaussian fields. Markov behavior in the wide sense. — *The Markov property for generalized random functions*: Biorthogonal generalized functions and the duality property. Stationary generalized functions. Biorthogonal generalized functions given by a differential form. Markov random functions generated by elliptic differential forms. Stochastic differential equations. — *Vector-valued stationary functions*: Conditions for existence of the dual field. The Markov property for stationary functions. Markov extensions of random processes.

O. I. MARICHEV. — **Handbook of integral transforms of higher transcendental functions: theory and algorithmic tables.** — Ellis Horwood series in mathematics and its applications. — Un vol. relié, 16 × 24, de 336 p. — Prix: £30.00. — Ellis Horwood Limited, Chichester, distributed by John Wiley and Sons, 1982.

*Basic theory*: The main theorem. Elementary examples. Background information. The gamma-function and its properties. Functions of hypergeometric type and Mellin-Barnes integrals. Gauss' hypergeometric function. The degenerate hypergeometric function. Bessel functions. Typical examples of the calculation of integrals. General integral transformations and their inversion formulae. — *Algorithmic tables of integral transforms*: Structure of the basic table of Mellin transforms and rules for using it. Basic table of Mellin transforms (table of the Mellin transforms of those functions whose images are the products of ratios of gamma-functions by constants). List of notation and notation of special functions. Index of key formulae for the basic table.

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# Benno Artmann

## Der Zahlbegriff

(Moderne Mathematik in elementarer Darstellung, Band 19). 1983. VIII, 265 Seiten mit 81 Figuren, kart. DM 34,-

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