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BIBLIOTHEK

Complex analysis — 5th Romanian-Finnish seminar. — Proceedings of the seminar held in Bucharest, June 28-July 3, 1981. — Ed. by C. Andreian Cazacu, N. Boboc, M. Jurchescu and I. Suci. — Lecture notes in mathematics, vol. 1013 and 1014. — 2 vol. brochés, 16,5 × 24, de xx, 393 p. et xx, 334 p. — Prix: DM 49.00 et DM 44.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

These 2 volumes contain papers selected from those submitted to the 5th Romanian-Finnish seminar on complex analysis. Except for the two introductory papers dedicated to the work of R. Nevanlinna and S. Stoilow, the founders of the Finnish-Romanian collaboration in complex analysis, only research papers are included which cover recent topics in the field.

Equations différentielles et systèmes de Pfaff dans le champ complexe — II: séminaire. — Edité par R. Gérard et J.-P. Ramis. — Lecture notes in mathematics, vol. 1015. — Un vol. broché, 16,5 × 24, de v, 411 p. — Prix: DM 49.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

This sequel to LNM vol. 712 is a result of the continuation of the Strasbourg seminar on differential equations and Pfaff systems in the complex field. The nine papers contribute new and unpublished material and can be grouped under 5 main headings, which were central themes of the seminar: 1. Finite difference equations in the complex field, 2. Singularities of differential equations, 3. Isomonodromic deformations, 4. Gevrey index theorems, 5. Linear connections with singularities.

Séminaire d'analyse P. Lelong-P. Dolbeault, H. Skoda, années 1981/1983. — Edité par P. Lelong, P. Dolbeault et H. Skoda. — Lecture notes in mathematics, vol. 1028. — Un vol. broché, 16,5 × 24, de viii, 328 p. — Prix: DM 39.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

Extr. de la table des matières: *Airault, H.*: Etude des conditions d'intégrabilité associées à un système différentiel linéaire. — *De Bartolomeis, P.*: Sur l'analyticité complexe de certaines applications harmoniques. — *Ben Messaoud, H.*: Courants intermédiaires associés à un courant positif fermé. — *Demailly, J.-P.*: Constructibilité des faisceaux de solutions des systèmes différentiels holonomes d'après Masaki Kashiwara. — *Klares, B. et Sadler, Ch.*: Systèmes de Pfaff et algèbres de Lie libres, étude d'une singularité polaire normale. — *Lelong, P.*: Discontinuité et annulation de l'opérateur de Monge-Ampère complexe. — *Le Potier, J.*: Fibrés vectoriels sur les surfaces K3. — *Mok, M.*: Application of an extension theorem for closed positive currents to Kähler geometry.

Ulrich CHRISTIAN. — **Selberg's Zeta-, L- and Eisensteinseries.** — Lecture notes in mathematics, vol. 1030. — Un vol. broché, 16,5 × 24, de XII, 196 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

Epstein's zetafunction of a binary quadratic form. — Preparational material. — Selberg's zeta- and L-series. — Selberg's Eisensteinseries. — Siegel's Eisensteinseries.

Dynamics and processes. — Proceedings of the 3d encounter in mathematics and physics, held in Bielefeld, Germany, Nov. 30-Dec. 4, 1981. — Edited by Ph. Blanchard and L. Streit. — Lecture notes in mathematics, vol. 1031. — Un vol. broché, 16,5 × 24, de IX, 213 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

Borchers, H.-J.: Symmetries and covariant representations. — *Combe, P. et al.*: Jump processes and applications to the trigonometric interaction. — *Cuntz, J.*: Generalized homomorphisms between C^* -algebras and KK -theory. — *Dress, A.*: Global equilibria and steady states of discrete networks, according to classical thermodynamics. — *Enss, V.*: Completeness of three body quantum scattering. — *Roberts, J. E.*: Mathematical structure in quantum field theory. — *Rost, H.*: Hydrodynamik gekoppelter Diffusionen: Fluktuation im Gleichgewicht. — *Seneor, R.*: Superrenormalizable infra-red theories. — *Souriau, J.-M.*: Un modèle d'univers confronté aux observations. — *Testard, D.*: Almost Mathieu equations for small and big coupling constants. — *Zehnder, E.*: Periodic solutions of Hamiltonian equations.

Measure theory and its applications. — Proceedings of a conference held at Sherbrooke, Québec, Canada, June 7-18, 1982. — Edited by J. M. Belley, J. Dubois and P. Morales. — Lecture notes in mathematics, vol. 1033. — Un vol. broché, 16,5 × 24, de XV, 317 p. — Prix: DM 39.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

From the contents: *Akcoglu, M.*: Differentiation of superadditive processes. — *Brooks, J. K. and Chacon, R. V.*: Convergence theorems in the theory of diffusions. — *Choquet, G.*: Représentation intégrale. Convexes et cônes convexes non localement compacts. Formes linéaires positives et mesures. — *Diestel, J. and Uhl, J. J.*: Progress in vector measures 1977-83. — *Oxtoby, J. C.*: Transitive points in a family of minimal sets. — *Hida, T. and Streit, L.*: White noise analysis and its application to Feynmann integral.

Julian MUSIELAK. — **Orlicz spaces and modular spaces.** — Lecture notes in mathematics, vol. 1034. — Un vol. broché, 16,5 × 24, de V, 222 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

In this monographic exposition of the theory of modular spaces — in particular of generalized Orlicz spaces of scalar-valued functions — special emphasis is given to modular convergence, without neglecting problems of norm convergence. Among other problems concerning generalized Orlicz spaces and Orlicz spaces, the author considers those of embeddings, compactness, uniform convexity, duality, interpolation of operators, and some applications to integral equations and approximation theory. He further deals with modular spaces such as spaces of functions of finite generalized variation, Sobolev-Orlicz spaces and Hardy-Orlicz spaces.

Nonlinear partial differential operators and quantization procedures. — Proceedings of a workshop held at Clausthal, FRG, 1981. — Edited by S. I. Andersson and H.-D. Doebner. — Lecture notes in mathematics, vol. 1037. — Un vol. broché, 16,5 × 24, de vii, 334 p. — Prix: DM 39.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

Non-linear partial differential operators: Binz, E.: Einstein's evolution equation for the vacuum formulated on a space of differentials of immersions. Forger, M.: Non-linear sigma models on symmetric spaces. Pasemann, F. B.: Linearized non-abelian gauge field theories. Segal, I. E.: Nonlinear wave equations. Wells, R. O.: The twistor-geometric representation of classical field theories. — Quantization procedures: Angermann, B. et al.: Quantum kinematics on smooth manifolds. Blattner, R. J.: On geometric quantization. Guillemin, V. and Sternberg, S.: The Frobenius reciprocity from a symplectic point of view. Kraskiewicz, J. and Raczk, R.: Quantization of models of quantum field theory with solitons. Paneitz, S. M.: Determination of a polarization by non-linear scattering, and examples of the resulting quantization. Sniatycki, J.: Constraints and quantization.

Francis BORCEUX, Gilberte VAN DEN BOSSCHE. — **Algebra in a localic topos with applications to ring theory.** — Lecture notes in mathematics, vol. 1038. — Un vol. broché, 16,5 × 24, de ix, 240 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

Categories of algebraic sheaves. — Formal initial segments. — Localizations and algebraic sheaves. — Integral theories and characterization theorem. — Spectrum of a theory. — Applications to module theory. — Pure representation of rings. — Gelfand rings. — *Appendix: Notes on Pierce's representation theorem.*

Heinz KRES. — **Statistical tables for multivariate analysis.** — A handbook with references to applications. — Translated by Peter Wadsack. — Springer series in statistics. — Un vol. relié, 16 × 24, de xxii, 504 p. — Prix: DM 159.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1983.

Contents: The primary tables for testing multivariate statistical hypotheses. — Tables related to the multivariate normal distribution. — Further tables for multivariate problems. — Appendix: Supplement. — Final remarks: Univariate test distributions as a special case of their multivariate analogs. This is a collection of 30 of the most significant statistical tables for multivariate analysis in applied research. This material — previously available only in isolated and often elusive publications — is presented here complete with a concise, systematic explanation for each table, defining its content and range of values, providing advice on its usage and recommendations on approximations for additional values, and incorporating bibliographical references.

Nonlinear dynamics and turbulence. — Edited by G. I. Barenblatt, G. Iooss, D. D. Joseph. — Interaction of mechanics and mathematics series, 1. — Un vol. relié, 16 × 24, de xvi, 356 p. — Prix: £35.00. — Pitman Advanced Publishing Program, Boston/London/Melbourne, 1983.

Turbulence in fluids has never had a precise mathematical definition although the general notion of dynamical systems can be made precise. Many of the papers in this volume aim to elucidate the implications of the generalized concept of turbulence, and

to study its utility in applications to observed turbulence in fluids. This aim is achieved via a combination of analytical, computer and numerical studies. *From the contents: Belayev, Yu. N. and Yavorskaya, I. M.:* Transition to stochasticity of viscous flow between rotating spheres. *Bunimovich, L. A.:* Statistical properties of Lorentz attractors. *Feigenbaum, M. J.:* Universal behaviour in nonlinear systems. *Foias, C. & Temam, R.:* Asymptotic numerical analysis for the Navier-Stokes equations. *Langford, W. F.:* A review of interactions of Hopf and steady-state bifurcations. *Plykin, R. V.:* Hyperbolic attractors of differentiable dynamical systems. *Takens, F.:* Distinguishing deterministic and random systems. *Zaslavsky, G. M.:* Stochasticity of the dynamical systems and the distribution of eigenvalues.

Magnus J. WENNINGER. — **Dual models.** — Un vol. relié, 19,5 × 26, de XII, 156 p. — Prix: £12.50/US\$19.95. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

Introduction: Basic notions about stellation and duality. Polar reciprocation. How facial planes are embedded in stellation patterns. — The 5 regular convex polyhedra and their duals. — The 13 semiregular convex polyhedra and their duals. — Stellated forms of convex duals. — The duals of nonconvex uniform polyhedra. — Some interesting polyhedral compounds. In this book, M. J. Wenninger presents the complete set of uniform duals of uniform polyhedra, thus rounding out a significant body of knowledge with respect to polyhedral forms. He begins with the simplest convex solids but then goes on to show how all the more difficult non-convex uniform polyhedral duals can be derived from a geometric theorem on duality that unifies and systematises the entire set of such duals.

D. SALAMON. — **Control and observation of neutral systems.** — Research notes in mathematics, vol. 91. — Un vol. broché, 17 × 25, de 207 p. — Prix: £9.95. — Pitman Advanced Publishing Program, Boston/London/Melbourne, 1983.

Preliminaries. — State space theory for neutral functional differential system. — Completeness and small solutions. — Controllability and observability. — Feedback stabilization and dynamic observation. — Appendix.

W. SCHWABHAEUSER, W. SZMIELEW, A. TARSKI. — **Metamathematische Methoden in der Geometrie.** — Hochschultext. — Un vol. broché, 16,5 × 24, de VIII, 482 p. — Prix: DM 69.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

Der erste Teil des Buches — von W. Schwabhäuser, W. Szmielew and A. Tarski — enthält einen bisher nicht veröffentlichten Aufbau der absoluten und der euklidischen Geometrie auf Grund eines Axiomensystems von Tarski, in dem nur die Streckenkongruenz und die Zwischenbeziehung als Grundbegriffe verwendet werden. Im zweiten Teil — von W. Schwabhäuser — werden metamathematische Methoden und Resultate für diese und andere (euklidische und nicht euklidische) Geometrien behandelt. Ueber diesen Gegenstand wird hier nun zum 1. Mal in Buchform berichtet.

Anant M. KSHIRSAGAR. — **A course in linear models.** — Statistics: textbooks and monographs, vol. 45. — Un vol. relié, 16 × 23,5, de XVI, 422 p. — Prix: FS 87.00. — Marcel Dekker, Inc., New York/Basel, 1983.

Linear models. — The general linear model. — Interval estimates and tests of hypotheses. — Multiple regression. — Analysis of variance. — Comparison of indivi-

dual means. — Analysis of variance (multi-way classification). — Analysis of variance: two-way classification, with unequal number of observations per cell. — Analysis of covariance. — Method of generalized least squares. — Missing plots technique and miscellaneous topics. — Variance components analysis.

Didier DACUNHA-DASTELLE, Marie DUFLO. — **Probabilités et statistiques, Tome 2: problèmes à temps mobile.** — Collection « Mathématiques appliquées pour la maîtrise ». — Un vol. broché, 16 × 24, de XIV, 286 p. — Prix: FF 138.00. — Masson, Paris/New York/Barcelone/Milan/Sao Paulo, 1983.

Ce tome donne la possibilité d'aborder en même temps les points essentiels de théorie des probabilités et un large spectre d'applications statistiques. *Table*: Introduction aux processus aléatoires. — Séries chronologiques. — Martingales à temps discret. — Statistique asymptotique. — Chaînes de Markov. — Décisions pas à pas. — Processus de comptage. — Processus à temps continu. — Intégrales stochastiques.

Jacqueline FOURASTIE, Bachira DAHDOUH. — **Exercices résolus de statistiques appliquées à l'économie.** — Un vol. broché, 15 × 22, de 258 p. — Prix: FF 78.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1983.

Les auteurs ont cherché à donner à ce livre un caractère pragmatique et à le rendre accessible à des personnes dont le niveau mathématique est assez élémentaire. Il traite des principaux types de graphiques, des séries statistiques simples: caractéristiques de tendance centrale et de dispersion; des séries statistiques doubles, corrélation linéaire, et des séries chronologiques, particulièrement utiles en économie, notamment des indices statistiques.

P. THUILLIER. — **Cours de mathématiques supérieures, vol. 3: algèbre.** — 5^e édition, 4^e tirage avec adjonction d'un complément sur l'algèbre de Boole. — Collection « Enseignement technique ». — Un vol. broché, 16 × 24, de XIII, 212 p. — Masson, Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1984.

Généralités sur les ensembles. — Applications: lois de composition. — Structures conférées à un ensemble par une ou plusieurs lois de composition internes. — Analyse combinatoire. — Vecteurs. — Produits de vecteurs. — Systèmes de vecteurs glissants, moments. — Nombres complexes. — Applications des nombres complexes. — Espaces vectoriels, applications linéaires. — Éléments de calcul matriciel, déterminants. — Compléments de calcul vectoriel. — Initiation à l'algèbre de Boole, définitions et propriétés fondamentales, fonctions booléennes simples.

Eberhard ZEIDLER. — **Vorlesungen über nicht-lineare Funktionalanalysis III: Variationsmethoden und Optimierung.** — 2. Aufl. — Teubner-Texte zur Mathematik, Band. 16. — Un vol. broché, 15 × 21, de 236 p. — Prix: M 19.00. — B. G. Teubner Verlagsgesellschaft, Leipzig, 1982.

Einführung in die Gesamtproblematik. — Extremalprobleme ohne Nebenbedingungen. — Extremalprobleme mit glatten Nebenbedingungen. — Extremalprobleme mit allgemeinen Nebenbedingungen. — Sattelpunkte und dualität. — Variationsungleichungen.

Jürgen PILZ. — **Bayesian estimation and experimental design in linear regression models.** — Teubner-Texte zur Mathematik, Bd. 55. — Un vol. broché, 15 × 21, de 216 p. — Prix: M 20.00. — B. G. Teubner Verlagsgesellschaft, Leipzig, 1983.

Bayesian regression and prior distributions: Estimation and design as a Bayesian decision problem. Choice of prior distribution. Conjugate prior distributions. — *Bayesian estimation:* Bayes estimation of the regression parameter. Optimality and robustness of the Bayes estimator. Bayesian interpretation of estimators using non-Bayesian prior knowledge. Bayes estimation in case of prior ignorance. Further problems. — *Bayesian experimental design:* The design problem for the linear Bayes estimator. Characterization of optimal designs. Construction of optimal continuous designs. Construction of exact optimal designs. Further problems.

Wolfgang TUTSCHKE. — **Partielle Differentialgleichungen: klassische, funktionalanalytische und komplexe Methoden.** — Teubner-Texte zur Mathematik, Bd. 27. — Un vol. broché, 15 × 21, de 192 p. — Prix: M 19.00. — B. G. Teubner Verlagsgesellschaft, 1983.

Grundbegriffe über partielle Differentialgleichungen. — Zurückführung partieller Differentialgleichungen auf Gewöhnliche. — Klassifikation partieller Differentialgleichungen. — Kriterien der eindeutigen Bestimmtheit von Lösungen partieller Differentialgleichungen. — Elliptische Differentialgleichungen. — Hyperbolische und parabolische Differentialgleichungen. — Die komplexe Schreibweise von partiellen Differentialgleichungen in der Ebene. — Lösungen von Differentialgleichungen im Sobolev'schen Sinn. — Regularitätssätze. — Differenzierbarkeitseigenschaften von Lösungen partieller Differentialgleichungen. — Der ΠG -operator. — Die Dirichlet'sche Randwertaufgabe für Systeme erster Ordnung in der Ebene.

Jindrich NECAS. — **Introduction to the theory of nonlinear elliptic equations.** — Teubner-Texte zur Mathematik, Bd. 52. — Un vol. broché, 15 × 21, de 202 p. — Prix: M 19.00. — B. G. Teubner Verlagsgesellschaft, Leipzig, 1983.

The topic of the lecture notes and something on modelling by partial differential equations. — Sobolev and Morrey-Campanato spaces. — Existence of weak solutions to boundary value problems for nonlinear second order elliptic systems. — An excursion to approximate methods. — Intermediary regularity. — Regularity of weak solutions to second order elliptic systems.

Recent progress of algebraic geometry in Japan. — Ed. by Masayoshi Nagata. — North-Holland mathematics studies, vol. 73. — Un vol. broché, 16,5 × 24, de viii, 214 p. — Prix: Dfl 110.00. — North-Holland publishing company, Amsterdam/New York/Oxford, 1983.

This volume contains survey reports on developments of algebraic geometry in Japan during the 1970's. *Contents:* Shigeru Iitaka: Birational geometry and logarithmic forms. — Masahide Kato: On a certain class of non-algebraic non-Kähler compact complex manifolds. — Makoto Namba: Deformations of compact complex manifolds and some related topics. — Kenji Ueno: Birational classification of algebraic varieties. — Masaki Maruyama: Algebraic vector bundles. — Masayoshi Miyanishi: On group actions. — Tadao Oda: Abelian varieties and related topics in algebraic geometry.

Ordinary differential equations and operators: a tribute to F. V. Atkinson. — Proceedings of a symposium held at Dundee, Scotland, March-July 1982. — Ed. by W. N. Everitt and R. T. Lewis. — Lecture notes in mathematics, vol. 1032. — Un vol. broché, 16,5 × 24,5, de xv, 521 p. — Prix: DM 62.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

The symposium was concerned with recent developments in the spectral theory of ordinary, and to a limited extent partial, differential operators, and in non-linear differential equations. Some of the contributions are survey papers in these areas: the others are research papers reporting on new and recent results. *From the contents:* C. Bennewitz, W. N. Everitt: On second-order left-definite boundary value problems. — L. Collatz: Inclusion theorems for solutions of differential equations with aid of pointwise or vector monotonicity. — W. N. Everitt, S. D. Wray: On quadratic integral inequalities associated with second-order symmetric differential expressions. — A. M. Fink, T. Kusano: Nonoscillation theorems for differential equations with general deviating arguments. — I. Knowles: Eigenvalue problems and the Riemann zeta function II. — K. Kreith, C. A. Swanson: Boundedness criteria for hyperbolic characteristic initial value problems. — N. G. Lloyd: Small amplitude limit cycles of polynomial differential equations. — T. T. Read: On the spectral theory of some non-symmetric second order differential operators. — R. Saxton: The Cauchy and backward Cauchy problem for a non-linearly hyperelastic/viscoelastic infinite rod. — Tung Chin-Chu: Poincaré's type of equations in the study of limit cycles.

Combinatorial mathematics X. — Proceedings of the conference held in Adelaide, Australia, August 23-27, 1982. — Ed. by L. R. A. Casse. — Lecture notes in mathematics, vol. 1036. — Un vol. broché, 16,5 × 24,5, de xi, 419 p. — Prix: DM 49.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

A great deal of research is done in Australia in the areas of graph theory, designs and finite geometries. The C.M.S.A. organizes an annual conference to bring together fellowresearchers from Australia and from several overseas countries. 31 exposés par: C. C. Chen and N. Quimpo. — J. W. P. Hirschfeld. — D. A. Holton. — A. D. Keedwell. — N. J. Pullman. — D. Stinson. — J. A. Thas. — S. Bourn. — L. Caccetta and N. Pullman. — R. J. Clarke. — C. J. Colbourn and M. J. Colbourn. — W. H. Cornish. — W. DeLauney. — M. N. Ellingham. — H. M. Gastineau-Hills. — H. M. Gastineau-Hills and J. Hammer. — D. Glynn. — W. Henderson, R. W. Kennington and C. E. M. Pearce. — S. G. Kettle. — K. L. McAvaney. — J. Pitman and P. Leske. — C. E. Praeger and P. Schultz. — A. Rahilly and D. Searby. — C. A. Rodger. — B. Smetaniuk. — M. Sved. — G. Szekeres. — W. D. Wallis and L. Zhu. — P. R. Wild and L. R. A. Casse. — N. C. Wormald.

Anton GOOD. — **Local analysis of Selberg's trace formula.** — Lecture notes in mathematics, vol. 1040. — Un vol. broché, 16,5 × 24,5, de iii, 128 p. — DM 19.80. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

Preliminaries. — Decompositions of G . — Integral representation of eigenfunctions. — Fourier coefficients and Kloosterman sums. — Computation of some integrals I. — Poincaré series and their Fourier series expansions. — Computation of some integrals II. — Analytic continuations and functional equations. — Sum formulae (first form). — Sum formulae (second form).

Allan GUT, Klaus D. SCHMIDT. — **Amarts and set function processes.** — Lecture notes in mathematics, vol. 1042. — Un vol. broché, 16,5 × 24,5, de III, 258 p. — Prix: DM 33.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

This lecture notes volume is in three disjoint parts. In the first, Allan Gut gives an introduction, for readers already familiar with martingales, to the theory of asymptotic martingales (amarts). The second part, by Klaus D. Schmidt, serves a twofold purpose: firstly, to give an exposition of the theory of integer-indexed, real and vector-valued amarts; secondly, to present a purely measure theoretic approach to amart theory. This method allows for a concise development of the theory and reveals the underlying nature of certain characteristic problems. It also leads to some generalizations of several known results. The third part of this book is a comprehensive bibliography, compiled by both authors and referencing over one hundred papers on amarts and related generalization of martingales.

R. L. WALLIS. — **Differential and integral calculus.** — VNR new mathematics library, vol. 11. — Un vol. relié, 14 × 22,5, de VIII, 153 p. — Prix: £9.95 (broché: £5.25). — Van Nostrand Reinhold (UK) Co. Ltd, Wokingham, Berkshire, England, 1984.

This text for first-year undergraduate students of engineering and science introduces ideas in an intuitive manner and then secures them by formal and rigorous methods when necessary. The basic theory of ordinary differentiation is developed and then extended to embrace the ideas of partial differentiation. An elementary treatment of the integral calculus is given, including a glimpse of the numerical techniques which sometimes need to be employed. *Contents*: Functions and limits. — Differential calculus. — Integration. — Partial differentiation. — Taylor series. — Maxima and minima.

Ivar EKELAND. — **Le calcul, l'imprévu: les figures du temps de Képler à Thom.** — Collection « Science ouverte ». — Un vol. broché, 13,5 × 20,5, de 170 p. — Prix: FF 69.00. — Editions du Seuil, Paris, 1984.

Des progrès spectaculaires ont été accomplis récemment dans la description scientifique du temps et du changement. Rompant avec le morne déterminisme classique, ces idées nouvelles modifient déjà notre pratique de la science et notre conception du savoir. Elles brouillent les frontières du calculable et de l'imprévisible, du déterminé et de l'aléatoire, de l'ordre et du désordre. On peut résumer les nouvelles conceptions en quelques images frappantes: le chat d'Arnold, le fer à cheval de Smale, la fronce de Thom. Elles ont réveillé un écho dans tous les domaines de la science et sont destinées à faire partie de notre bagage culturel. Illustrées d'expériences curieuses et de surprenants paradoxes, ces idées sont aujourd'hui communicables au profane.

Alexander OSTROWSKI. — **Collected mathematical papers, vol. 3: number theory, geometry, topology, convergence.** — Un vol. relié, 17,5 × 24, de 532 p. — Prix: FS 68.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

Alexander M. Ostrowski was born on September 25, 1893, in Kiev, where he received his initial mathematical education. As a member of the "Göttingen School" (at which time he was assistant to Felix Klein) he quickly earned his reputation as one of the world's leading mathematicians. In 1927 he accepted a call to the University of Basel where he remained until his retirement in 1958. Professor Ostrowski is one of the last great mathematicians to command a comprehensive knowledge of

mathematical science while also having worked and published in virtually all of its branches.

Robert Endre TARJAN. — **Data structures and network algorithms.** — CBMS-NSF regional conference series in applied mathematics, vol. 44. — Un vol. broché, 17,5 × 25, de VII, 131 p. — Prix: £10.00. — Society for industrial and applied mathematics, Philadelphia, Penn., distributed by John Wiley and Sons, Chichester, 1983.

In the last fifteen years there has been an explosive growth in the field of combinatorial algorithms. Although much of the recent work is theoretical in nature, many newly discovered algorithms are quite practical. These algorithms depend not only on new results in combinatorics and especially in graph theory, but also on the development of new data structures and new techniques for analyzing algorithms. The purpose of this book is to reveal the interplay of these areas by explaining the most efficient known algorithms for a selection of combinatorial problems. The book covers four classical problems in network optimization, including a development of the data structure they use and an analysis of their running times.

William J. J. REY. — **Introduction to robust and quasi-robust statistical methods.** — Universitext. — Un vol. broché, 16,5 × 24, de IX, 236 p. — Prix: DM 36.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

The first part of the book surveys available methods. The theory is presented in an expository style and in a unifying manner which allows seemingly disparate items to find their place in a common structure. The second part of the book treats the methods as they are encountered in real life situation. Robustness requirements are relaxed a little and "quasi-robust" estimators are obtained; the latter are much more reliable than the standard estimators without being as difficult to handle as the robust estimators. Algorithms are described and test cases are discussed.

Zahlen. — Von H.-D. Ebbinghaus, H. Hermes, F. Hirzebruch, M. Koecher, K. Mainzer, A. Prestel, R. Remmert. — Redaktion von K. Lamotke. — Grundwissen Mathematik, Bd. 1. — Un vol. broché, 16,5 × 24, de XII, 291 p. — Prix: DM 48.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

VON DEN NATÜRLICHEN ZU DEN KOMPLEXEN ZAHLEN: *K. Mainzer*: Natürliche, ganze und rationale Zahlen. — *K. Mainzer*: Reelle Zahlen. — *R. Remmert*: Komplexe Zahlen. — *R. Remmert*: Fundamentalsatz der Algebra. — *R. Remmert*: Was ist π ?. — REELLE DIVISIONSALGEBREN: *M. Koecher*, *R. Remmert*: Repertorium: Grundbegriffe aus der Theorie der Algebren. Hamiltonsche Quaternionen. Isomorphiesätze von Frobenius und Hopf. Cayley-Zahlen oder alternative Divisionsalgebren. Kompositionsalgebren. Satz von Hurwitz. — *F. Hirzebruch*: Divisionsalgebren und Topologie. — AUSBLICKE: *A. Prestel*: Non-standard Analysis. — *H. Hermes*: Zahlen und Spiels. — *H.-D. Ebbinghaus*: Mengenlehre und Mathematik.

Martin BRAUN. — **Differential equations and their applications: an introduction to applied mathematics.** — 3rd edition. — Applied mathematical sciences, vol. 15. — Un vol. relié, 16 × 24, de XIII, 546 p. — Prix: DM 66.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1983.

This textbook is a unique blend of the theory of differential equations and their exciting application to "real world" problems. First and foremost, it is a rigorous

study of ordinary differential equations and can be fully understood by anyone who has completed one year of calculus. However, in addition to the traditional applications, it also contains many "real life" problems. These applications are completely self contained. There are three major changes in this edition. First, the section on singular solutions of differential equations has been completely rewritten. Second major change is the addition of a new section dealing with bifurcation theory. Third major change is in the section "Mechanical vibrations" where the metric system of units has been introduced. — *Contents*: First-order differential equations. — Second-order linear differential equations. — Systems of differential equations. — Qualitative theory of differential equations. — Separation of variables and Fourier series. — Some simple facts concerning functions of several variables. — Sequences and series. — Introduction to APL.

Jan MIKUSINSKI. — **Operational calculus, volume 1.** — 2nd English edition. — Pure and applied mathematics, vol. 109. — Un vol. relié, 17,5 × 24,5, de 321 p. — Prix: \$27.00. — Pergamon press, Oxford/New York/Toronto/Sydney/Paris/Frankfurt, and PWN — Polish scientific publishers, Warszawa, 1983.

Operational algebra: The concept and properties of a convolution of continuous functions. Theorem of Titchmarsh. Operators. Ordinary differential equations with constant coefficients. Theory of electric circuit. General solutions of differential equations and boundary problems. Discontinuous functions. Applications to the statics of beams. — *Sequences and series of operators*: Sequences of operators. Series of translation operators. Difference equations. Power series. — *The operational differential calculus*: Operational functions and their derivatives. Exponential functions. Differential equation $x''(\lambda) = wx(\lambda)$. Vibrations of a string. The equation of heat. The equation of telegraphy. Applications to chromatography. The algebraic derivative.

Vasile I. ISTRATESCU. — **Strict convexity and complex strict convexity: theory and applications.** — Lecture notes in pure and applied mathematics, vol. 89. — Un vol. broché, 18 × 25, de 336 p. — Prix: FS 133.00. — Marcel Dekker, Inc., New York/Basel, 1984.

Applications of linear topological properties, which are inseparably linked with a fixed geometrical object, depend upon the thorough understanding of the linear topological properties within the framework of a given norm on the space. This volume presents a comprehensive survey of the properties of a Banach space related to strict convexity, providing a requisite information base. For easy understanding, the book opens with basic results of linear functional analysis. This valuable introduction leads into a systematic study of this important subject. — *Contents*: Banach spaces. Strict convexity. Complex strict convexity. Classes of operators and the geometric structure of Banach spaces.

Wilhelm BLASCHKE. — **Gesammelte Werke, Bd. 1: Schraublinien, unendliche ebene Gruppen, Geometrie der Sphäre, Hermitesche Geometrie, Geraden-Kugel-Transformation.** — Herausgegeben von W. Burau, S. S. Chern, K. Leichtweiss, H. R. Müller, L. A. Santalo, U. Simon, K. Strubecker. — Kommentiert von K. Strubecker. — Un vol. relié, 17,5 × 24,5, de 365 p. — Prix: DM 164.00. — Thales-Verlag, Essen, 1982.

Thales-Verlag now offers the collected works of Wilhelm Blaschke in 6 volumes. The active cooperation of the Wilhelm-Blaschke-Memorial-Foundation has made it

possible to gain access to works and papers, which until now have been difficult or impossible for mathematicians to obtain. — *Arbeiten von Blaschke*: Bemerkungen über allgemeine Schraubenlinien. Ueber einige unendliche Gruppen von Transformationen orientierter Ebenen im Euklidischen Raume. Ueber einige unendliche Gruppen von Berührungstransformationen in der Ebene. Untersuchungen über die Geometrie der Speere in der Euklidischen Ebene. Zur Geometrie der Speere im Euklidischen Raum. Ueber die Laguerresche Geometrie orientierter Geraden in der Ebene I. Ein Beitrag zur Liniengeometrie. Sulla geometria di Hermite. Trigonometria Hermitiana (mit H. Terheggen). Ueber die Massbestimmungen von Hermite. Contributi alla geometria analitica degli spazi di Hermite. Contributi alla geometria proiettiva complessa. Zur analytischen Geometrie in der Ebene von Hermite. Isotrope Vierfläche. Kinematische Begründung von Lies Geraden-Kugel-Abbildung. Sulla geometria cinematica e descrittiva.

Jacques VEY. — **Travaux de Jacques Vey.** — Articles rassemblés et présentés par les laboratoires de mathématiques pures des Universités de Grenoble I et de Savoie. — Un vol. relié, 16 × 25, de xvi, 277 p. — ISBN: 2-222-03270-9. — Editions du Centre national de la recherche scientifique, Paris, 1983.

Une notion d'hyperbolicité pour les variétés localement plates. — Sur les automorphismes affines des ouverts convexes dans les espaces numériques. — Sur les automorphismes affines des ouverts convexes saillants. — Sur la division des domaines bornés. — Sur la division des domaines de Siegel. — Un invariant pour les feuilletages de codimension 1. — Sur la cohomologie de l'algèbre des champs de vecteurs sur une variété. — Quelques constructions relatives aux Γ -structures. — Déformation du crochet de Poisson sur les variétés symplectiques. — Sur la cohomologie des champs de vecteurs symplectiques formels. — Rapport sur les champs symplectiques formels. — Un problème de cohomologie relative. — Sur le lemme de Morse. — Sur certains systèmes dynamiques séparables. — Sur les orbites périodiques des systèmes dynamiques au voisinage d'un point d'équilibre. — Orbites périodiques d'un système hamiltonien au voisinage d'un point d'équilibre. — Principe de la phase résonnante. — Le lemme de Morse isochore. — Algèbres commutatives de champs de vecteurs isochores. — Verres de Spin I. — Sur les connections riemanniennes. — Un théorème de P. Gilkey. — Verres de Spin II.

S. FENYÖ, H. W. STOLLE. — **Theorie und Praxis der linearen Integralgleichungen, Bd. 3.** — Lehrbücher und Monographien aus dem Gebiete der exakten Wissenschaften. Mathematische Reihe, Bd. 76. — Un vol. relié, 17 × 24, de 548 p. — Prix: FS 106.00. — Birkhäuser-Verlag, Basel/Boston/Stuttgart, 1984.

Lineare Integralgleichungen erster Art: Eine allgemeine Theorie der Integralgleichungen erster Art. Integraltransformationen der mathematischen Physik. — *Spezielle Typen von Integralgleichungen*: Die Wiener-Hopfsche Integralgleichung. Volterrasche Integralgleichungen. Zwei- und dreifache Integralgleichungen. Singuläre Integralgleichungen mit einem Cauchykernel. Weitere spezielle Typen von Integralgleichungen.

S. FENYÖ, H. W. STOLLE. — **Theorie und Praxis der linearen Integralgleichungen, Bd. 4.** — Lehrbücher und Monographien aus dem Gebiete der exakten Wissenschaften. Mathematische Reihe, Bd. 77. — Un vol. relié, 17 × 24, de 708 p. — Prix: FS 118.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

Numerische Methoden zur Lösung linearer Integralgleichungen: Approximation von Kernen durch ausgeartete Kerne. Iterationsverfahren für Fredholmsche Gleichungen zweiter Art. Quadraturformelmethode für Fredholmsche Integralgleichungen zweiter Art. Variationsmethoden und Projektionsverfahren. Weitere numerische Verfahren für Fredholmsche und Volterrasche Integralgleichungen. Lösung von Integralgleichungen mit Splinefunktionen. Einige Lösungsverfahren für Integralgleichungen mit singulären Kernen. Spezielle Methoden zur Eigenwertberechnung. Fehlerschranken, Konvergenz und Stabilität der Näherungslösungen von Operatorgleichungen zweiter Art. — *Einige Anwendungen von Integralgleichungen*: Anwendung der Theorie der Integralgleichungen zur Lösung von Differentialgleichungen. Integralgleichungen und konforme Abbildungen. Einige Probleme der Elastizitätstheorie. Einige Probleme der Strömungsmechanik. Einige Probleme der Elektrodynamik. Die Integralgleichung der Neutronentransporttheorie. Die Integralgleichung der Erneuerungstheorie.

William FULTON. — **Intersection theory**. — Ergebnisse der Mathematik und ihrer Grenzgebiete. 3. Folge, Bd. 2. — Un vol. relié, 17 × 25, de xi, 470 p. — Prix: DM 118.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This is the first modern attempt at a complete and self-contained presentation of intersection theory, including both the local theory of intersection multiplicities and the construction of global intersection rings. After developing the foundations, the author discusses intersection theory in its classical and modern applications. He includes new and stronger theorems and significantly simpler proofs than those which have appeared in the past. Nearly half the volume is devoted to examples which illustrate the range of applications, indicate generalizations of the theorems, and point out relations with the literature. The usefulness of the report is enhanced by historical sections, by summaries outlining the contents of the chapters, by appendices providing the necessary algebra and some basic geometry, and by an extensive bibliography.

A. V. SKOROHOD. — **Random linear operators**. — Mathematics and its applications (Soviet series). — Un vol. relié, 16 × 23, de xvi, 199 p. — Prix: Dfl. 115.00. — D. Reidel publishing company, Dordrecht/Boston/Lancaster, 1984.

This book deals with a subject which is sure to develop considerably in the next decade and which, at the moment, presents many challenging (open) problems as well as a substantial body of applicable results. — Contents: *Random operators in Hilbert space*: Basic definitions. Characteristic functions of random operators. Convergence of random operators. — *Function of random operators*: Spectral representation for symmetric random operators. Equations with symmetric random operators. Equations with semibounded random operators. — *Operator-valued martingales*: Operator-valued martingale sequences. Convergence of infinite products of independent random operators. Continuous operator-valued martingales. — *Stochastic integrals and equations*: Stochastic integrals with respect to an X -valued martingale. Stochastic integral with respect to an operator-valued martingale. Stochastic operator equations. — *Linear stochastic operator equations*: Generalization of the stochastic operator integral. Linear differential operator equations. Continuous stochastic semigroups.

Wilhelm MAGNUS. — **Collected papers.** — Edited by Gilbert Baumslag and Bruce Chandler. — Un vol. relié, 18 × 25, de xvi, 726 p. — Prix: DM 88.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This is a complete collection of the scientific papers of Wilhelm Magnus, known mainly for his work in group theory and the theory of special functions. In addition to writings which first appeared in scientific journals (1930-1981), the volume also includes Magnus's celebrated article „Allgemeine Gruppentheorie“ written for the „Enzyklopädie der mathematischen Wissenschaften“ published in 1939. Completed with introductory essays by Bruce Chandler and Gilbert Baumslag, the book will prove an important tool for scientists working in the author's fields of research.

Luisa Turrin FERNHOLZ. — **Von Mises calculus for statistical functionals.** — Lecture notes in statistics, vol. 19. — Un vol. broché, 15,5 × 23,5, de viii, 124 p. — Prix: DM 28.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1983.

Richard von Mises' theory for the analysis of the asymptotic behavior of non-linear statistical functionals, first developed around 40 years ago, has experienced a renaissance due to developments in the field of robust statistics. Unexpectedly, formal von Mises calculations provide a convenient heuristic tool for the analysis of the asymptotic distributions of robust statistics. This book presents von Mises' theory in a rigorous mathematical framework which is sufficiently straightforward to be applied routinely with little more effort than is required for the calculation of the inference curve. The author's approach is based on the Hadamard derivative and applicable to diverse forms of statistical functionals. — *Contents:* Introduction. Von Mises' method. Hadamard differentiation. Some probability theory en $C[0, 1]$ and $D[0, 1]$. M -, L -, and R -estimators. Calculus on functions spaces. Applications. Asymptotic efficiency.

Mathematical learning models: theory and algorithms: proceedings of a conference, Bad Honnef, 1982. — Edited by Ulrich Herkenrath, Dieter Kalin, Walter Vogel. — Lecture notes in statistics, vol. 20. — Un vol. broché, 15,5 × 23,5, de xiii, 226 p. — Prix: DM 46.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1983.

This conference was organized by the Institute of applied mathematics of the University of Bonn and took place in the Physikzentrum in Bad Honnef, from May 3 to May 7, 1982. The idea of the organizers was to bring together experts who work on very related problems, but partially by using different approaches. The main subjects of the program were: mathematical learning models, bandit problems, stochastic approximation procedures, sequential decision processes with unknown law of nature.

Howell TONG. — **Threshold models in non-linear time series analysis.** — Lecture notes in statistics, vol. 21. — Un vol. broché, 15,5 × 23,5, de x, 323 p. — Prix: DM 59.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1983.

Introduction: Time series model building. Stationarity. Linear Gaussian models. Some advantages and some limitations of ARMA models. What next? — *Some basic concepts:* Orientation. Limit cycles. Some examples of threshold models. Time delay. Discussion. — *Threshold models:* A canonical form. Generality of SETAR models. Non-linear difference equations. Threshold models and discrete-time non-linear vibrations. Ergodicity. Stationary distributions and moments. Cyclical structure and multi-step-ahead forecasting. — *Identification:* A general principle. Estimation of parameters.

Sampling properties. Diagnostics and graphical methods. Miscellanea. — *Some case studies*: Analysis of some ecological data. Analysis of the sunspot numbers. Analysis of some riverflow data. A case study with laboratory data. A fuzzy extension. Concluding remarks.

J. A. HARTIGAN. — **Bayes theory**. — Springer series in statistics. — Un vol. relié, 16 × 24, de XII, 145 p. — Prix: DM 46.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1983.

This text offers a well-balanced Bayesian view of statistics. The author establishes an axiomatic probability calculus suitable for Bayes theory (a theory of statistical inference based on probability). He presents methods for determining the probabilities in practical problems, and relates Bayesian to non-Bayesian methods. This is the first formal treatment of Bayes theory to examine probability distributions in which the total probability is infinite rather than unitary, creating interesting complications in defining conditional probability and limit concepts. Also unique is the technique of objectively deriving probabilities from subjective similarity judgements.

Izu VAISMAN. — **A first course in differential geometry**. — Monographs and textbooks in pure and applied mathematics, vol. 80. — Un vol. relié, 16 × 23,5, de 184 p. — Prix: FS 89.00. — Marcel Dekker, Inc., New York/Basel, 1984.

Differential geometry can be taught in several ways, each with its own advantages and disadvantages. This unique text emphasizes the use of differentiable manifolds, an approach that leads to quicker understanding of modern differential geometry on manifolds. — Contents: *Differentiable manifolds in R^n* : The space R^n . Differentiable manifolds in R^n . Parameterizations and maps. The tangent space of a manifold. Differentiable mappings of manifolds. Orientable and nonorientable manifolds. Tensors and tensor fields on manifolds. — *Curves in E^2 and E^3* : The natural parameterization. Local Euclidean invariants. Computation formulas: comments and applications. Global theorems for embedded curves. Plane curves. — *Surfaces in E^3* : The fundamental tensors. Geometry of the second fundamental form. The covariant derivative and the fundamental theorem. Curves on surfaces: geodesic lines. Some particular classes of surfaces. The Gauss-Bonnet formula. Compact surfaces.

Helmut BAUMGÄRTEL, Manfred WOLLENBERG. — **Mathematical scattering theory**. — Operator theory: advances and applications, vol. 9. — Un vol. relié, 17 × 24, de 449 p. — Prix: FS 85.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1983.

This book provides a rigorous mathematical foundation of several physical scattering theories. Scattering of quantum objects and of classical waves and particles are among the physical phenomena covered by this theory. Mathematically this book presents a branch of operator theory which is concerned with problems of perturbation theory for linear operators. — Contents: *Selfadjoint operators in Hilbert spaces*: Preliminaries. Multiplicity theory. Spectral theory. Direct integrals and spectral representations. Operator spectral integrals. — *Algebras of asymptotic constants*: General theory of asymptotic constants. Special classes of asymptotic constants. The invariance of wave morphisms and wave algebras. — *Two-space wave operators and scattering operators*: Elementary theory of wave and scattering operators. Identification operators. Structural properties of wave and scattering operators. Lax-Phillips evolutions

and two-spaces wave operators. Stationary theory. — *Existence and completeness of wave operators*: Stationary methods. Time-falloff methods. Trace class methods. Smooth perturbations. — *Some properties of the scattering operator, the scattering matrix, and the scattering amplitude*: Representations of the scattering operator and the scattering amplitude, and analyticity properties of the scattering amplitude. Spectral properties of the scattering amplitude.

E. LAMPRECHT. — **Lineare Algebra 2**. — Uni-Taschenbücher, Bd. 1224. — Un vol. broché, 12 × 18,5, de IX, 336 p. — Prix: SF 24.80. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1983.

Der zweite Band der linearen Algebra führt den mit UTB 1021 und mit der „Einführung in die Algebra“ (UTB 739) begonnenen Kurs dieses Gegenstandes weiter und schliesst ihn weitgehend ab. Hierzu gehört die Theorie der sesquilinearen und quadratischen Formen sowie die der unitären und euklidischen Vektorräume in Kapitel III. Kapitel IV enthält einen Abriss von Methoden und Ergebnissen der multilinearen Algebra, so wie sie für Anwendungen gebraucht werden; in Kapitel V wird gezeigt, wie die lineare und multilineare Algebra zur Begründung und Diskussion der linear-analytischen Geometrie verwendet werden kann. Auch hier sind den einzelnen Paragraphen zur inhaltlichen Vertiefung und Einübung der Gegenstände jeweils umfangreiche Ergänzungen und Aufgabensammlungen beigelegt.

V. A. YEMELICHEV, M. M. KOVALEV, M. K. KRAVTSOV. — **Polytopes, graphs and optimisation**. — Translated by G. H. Lawden. — Un vol. relié, 18 × 26, de IV, 423 p. — Prix: £25.00. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

This is the first book devoted to the combinatorial theory of polyhedra, an important branch of applied mathematics. The basis of the work is an examination of combinatorial, geometrical and algebraic properties of polyhedra in close connection with optimisation problems. There is a full account of the classic results (the Euler-Poincaré formula, Minkowski and Weyl duality theorems, Dehn-Sommerville equations) as well as an interesting presentation of new questions emerging from optimisation problems: polyhedral aspects of the theory of matroids and polymatroids, the structure of integer polyhedra from various combinatorial problems, minimax theorems of combinatorics and the connections between linear programming and combinatorial topology. Four basic problems of the combinatorial theory of polyhedra are isolated and examined in detail: the classification and enumeration of polyhedra; the study of the meaning of polyhedron vector functions, the components of which give the number of faces of relative size; the determination of graphical characteristics of polyhedra; constructing convex hulls of discrete sets. There are a great number of challenging exercises provided throughout the text.

Trends in theory and practice of nonlinear differential equations. — Edited by V. Lakshmikantham. — Lecture notes in pure and applied mathematics, vol. 90. — Un vol. broché, 18 × 26, de 592 p. — Prix: SF 163.00. — Marcel Dekker, Inc., New York/Basel, 1984.

Presenting the work of 91 distinguished mathematicians from 18 nations, this volume provides new perspectives on the theory and practice of nonlinear differential equations. This practical resource stimulates interdisciplinary cooperation between

mathematicians and applied scientists, offers details of recent trends and new research results as well as broad surveys of important topics for a unified overview of the field, and combines coverage of such diverse applications as biomathematics, heat transfer, frequency domain analysis of differential equations, and reaction-diffusion equations in a single source.

E. J. N. LOOIJENGA. — **Isolated singular points on complete intersections.** — London mathematical society lecture note series, vol. 77. — Un vol. broché, 15 × 23, de ix, 199 p. — Prix: £12.50. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

Singularity theory is not a field in itself, but rather an application of algebraic geometry, analytic geometry and differential analysis. The adjective "singular" in the title refers here to singular points of complex-analytic or algebraic varieties or mappings. A tractable (and very natural) class of singularities to study are the isolated complete intersection singularities, and much progress has been made over the past decade in understanding these and their deformations. The main purpose of this book is to provide an introduction to the recent work. *Contents*: Examples of isolated singular points. — The Milnor fibration. — Picard-Lefschetz formulas. — Critical space and discriminant space. — Relative monodromy. — Deformations. — Vanishing lattices, monodromy groups and adjacency. — The local Gauss-Manin connection. — Applications of the local Gauss-Manin connection.

Stewart A. ROBERTSON. — **Polytopes and symmetry.** — London mathematical society lecture note series, vol. 90. — Un vol. broché, 15 × 23, de xv, 112 p. — Prix: £7.95. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

Convex polytopes are the analogues in space of any dimension of convex polygons and of convex polyhedra in ordinary space. This book describes a fresh approach to the classification of these objects according to their symmetry properties, based on ideas of topology and transformation group theory. Although there is considerable agreement with traditional treatments, a number of new concepts emerge that present classical ideas in a quite new way. For example, the family of regular convex polytopes is extended to the family of "perfect polytopes". Thus the familiar set of five Platonic polyhedra is replaced by the less familiar set of nine perfect polyhedra. Among the many unsolved problems that arise, that of finding all perfect polytopes, and more generally all perfect convex bodies, is perhaps the most attractive.

Jacqueline MOSSINO. — **Inégalités isopérimétriques et applications en physique.** — Collection « Travaux en cours ». — Un vol. broché, 17 × 24, de 200 p. — Prix: FF 130.00. — Hermann, Paris, 1984.

Ce livre développe les techniques isopérimétriques dans les équations aux dérivées partielles elliptiques, les espaces de travail étant des espaces de Sobolev. L'ouvrage est particulièrement intéressant en ce qu'il renouvelle en grande partie les développements déjà anciens et classiques de Polya et Szegö.

Pierre DAZORD, Nicole DESOLNEUX-MOULIS. — **Séminaire sud-rhodanien de géométrie I: géométrie symplectique et de contact.** — Journées lyonnaises de la Société mathématique de France, 14-17 juin 1983. — Collection « Travaux en cours ». — Un vol. broché, 17 × 24, de 128 p. — Prix: FF 110.00. — Hermann, Paris, 1984.

Ce volume est consacré à la géométrie symplectique et de contact. Les articles ont tous un caractère explicite: construction d'un complexe différentiel abstrait permettant d'étudier génériquement les singularités lagrangiennes, calculs de groupes de cobordisme entre solutions de relations différentielles, caractérisation de structures symplectiques ou de contact dont la forme canonique a une expression globale donnée, résolution de problèmes d'équivalence locale pour les systèmes de Pfaff non complètement intégrales munis d'une polarisation, géométrie métrique des structures de contact, problèmes d'existence et de classification.

Pierre DAZORD, Nicole DESOLNEUX-MOULIS. — **Séminaire sud-rhodanien de géométrie II: feuilletages et quantification géométrique.** — Journées lyonnaises de la Société mathématique de France, 14-17 juin 1983. — Collection « Travaux en cours ». — Un vol. broché, 17 × 24, de 148 p. — Prix: FF 130.00. — Hermann, Paris, 1984.

Ce volume se situe à la charnière entre la géométrie symplectique et les aspects théoriques fondamentaux de la physique mathématique: existence de star-produits sur une variété symplectique quelconque, cohomologie de l'algèbre de Lie des vecteurs tangents à un feuilletage à valeurs dans les formes normales, modèle local d'une orbite d'action hamiltonienne, étude géométrique des polarisations, construction d'une classe de Maslov d'ordre supérieur, introduction du concept de groupe différentiel en vue de la mécanique classique et de la quantification géométrique, problème de la complète intégrabilité.

David R. OWEN. — **A first course in the mathematical foundations of thermodynamics.** — Undergraduate texts in mathematics. — Un vol. relié, 16 × 24, de xvii, 134 p. — Prix: DM 74.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

The author's approach is unique in that it employs a concept of thermodynamical systems general enough to cover important examples outside the scope of classical treatments, and simple enough to be within reach of university students. — *Contents:* Classical thermodynamics. — Systems with perfect accessibility. — A modern treatment of the first and the second law. — Energy and entropy for thermodynamical systems. — Isothermal processes of homogeneous filaments. — Homogeneous bodies with viscosity.

Lev V. PONTRJAGIN. — **Learning higher mathematics, part I: "The method of coordinates", part II: "Analysis of the infinitely small".** — Springer series in Soviet mathematics. — Translated from the Russian by Edwin Hewitt. — Un vol. broché, 15,5 × 23,5, de viii, 304 p. — Prix: DM 78.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This book gives an elementary exposition of basic classical calculus by one of the most eminent mathematicians of this century. Part one: "The method of coordinates", develops an elementary treatise of basic analytic geometry on the plane and in three-dimensional space, including the classification of curves and surfaces of the second order. The fundamental theorem of algebra, based upon the concepts of continuous deformation and the winding number of a closed curve, is proven on an intuitive level. In the second part "Analysis of the infinitely small", real and complex functions are studied together. The basic theory of functions of complex variables is developed through Laurent series and the investigation of the behavior of functions near an essential singularity.

M. A. KRASNOSEL'SKII, P. P. ZABREIKO. — **Geometrical methods of nonlinear analysis.** — Translated from the Russian by Christian C. Fenske. — Grundlehren der mathematischen Wissenschaften, vol. 263. — Un vol. relié, 16,5 × 24, de xix, 409 p. — Prix: DM 138.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Vector fields in finite dimensional spaces: Extensions of vector fields. Homotopic vector fields. Rotation of vector fields. Theorems on singular points. Hopf's theorem. Linear vector fields. Product theorems. Periodic and odd vector fields. Special coverings of spheres. Homogeneous polynomials. Smooth vector fields. Gradient fields. Periodic and bounded solutions of differential equations. Construction of guiding functions. The index of a singular point of a planar vector field. — *Completely continuous vector fields:* Continuous fields in infinite dimensional spaces. Completely continuous operators. Finite dimensional approximations. Homotopy for completely continuous vector fields. Rotation of completely continuous vector fields. Linear and almost linear completely continuous fields. Product of rotations. Smooth completely continuous vector fields. Computing the index of a singular point in critical cases. — *Principles of relatedness:* Invariance principles for the rotation. Composition of operators. Transition to equations in a subspace. Forced vibrations. Boundary value problems. The principle of relatedness for elliptic equations. Vector fields involving iterated operators. — *Fields with noncompact operators:* The methods of partial redefinition of operators. Fields with positive operators. The method of partial inversion. Some generalizations. Multivalued mappings. — *Solvability of nonlinear equations:* Invariant sets and fixed points. Fixed points of monotone operators. Dissipative operators. Almost linear equations. The principle of nonzero rotation. One-sided estimates. — *Equations with many solutions:* Existence of nonzero solutions. Expansions and compressions of cones. Step function nonlinearities. Equations with concave and convex operators. Nonzero solutions of parametrized equations. Connectivity principles. — *Construction of solutions:* The method of successive approximation. Approximating equations. Error estimates. The index of a stable solution. — *Small perturbations of nonlinear equations:* Perturbations and existence theorems. Perturbations of isolated solutions. Functionalizing the parameter. The principle of changing index. Stability of critical values.

David MUMFORD. — **Tata lectures on theta II: Jacobian theta functions and differential equations.** — With the collaboration of C. Musili, M. Nori, E. Previato, M. Stillman and H. Umemura. — Progress in mathematics, vol. 43. — Un vol. relié, 15,5 × 23,5, de xiv, 272 p. — Prix: FS 54.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

The second in a series of three volumes surveying the theory of theta functions, this volume gives emphasis to the special properties of the theta functions associated with compact Riemann surfaces and how they lead to solutions of the Korteweg-de Vries equation as well as other non-linear differential equations of mathematical physics. This book presents an explicit elementary construction of hyperelliptic Jacobian varieties and is self-contained introduction to the theory of the Jacobians. It also ties together 19th century discoveries due to Jacobi, Neumann, and Frobenius with recent discoveries of Gelfand, McKean, Moser, John Fay, and others. — *Contents:* An elementary construction of hyperelliptic Jacobians. — Fay's trisecant identity for Jacobian theta functions. — Resolutions of algebraic equations by theta constants, by Hiroshi Umemura.

Victor G. KAC. — **Infinite dimensional Lie algebras: an introduction.** — Progress in mathematics, vol. 44. — Un vol. relié, 15,5 × 23,5, de xvi, 245 p. — Prix: FS 49.00. — Birkhäuser, Boston/Basel/Stuttgart, 1983.

About 1967, Kac and Moody, in Moscow and Saskatchewan respectively, began a study of a new class of infinite-dimensional Lie algebras, generalizing semi-simple finite-dimensional Lie algebras. In the past 15 years this theory has emerged as a field that has close connections to many areas of mathematics and mathematical physics, such as invariant theory, combinatorics, topology, the theory of modular forms and theta functions, the theory of singularities, Hamiltonian mechanics, and quantum theory. This introduction to the field contains a detailed exposition of the foundations of the theory of Kac-Moody Lie algebras and their representations, as well as applications to, among others, combinatorics, modular forms and theta functions, and KdV-type hierarchies.

Siegfried MORAN. — **The mathematical theory of knots and braids: an introduction.** — North-Holland mathematics studies, vol. 82. — Un vol. broché, 16,5 × 24, de xii, 296 p. — Prix: Dfl 100.00. — North-Holland, Amsterdam/New York/Oxford, 1983.

Some necessary group theory. — Some necessary topology. — Knots and pictures of knots. — Braids and the braid group. — Some connections between braids and links. — The group of a link. — Group rings. — Derivatives. — Alexander matrices. — Elementary ideal of Alexander matrix. — Alexander polynomial of a knot. — Alexander polynomial of a link. — Some matrix representations of the braid group. — Operations on braids and resulting links. — The group of a free endomorphism. — Alexander polynomials revisited. — Meridians and longitudes. — Symmetry of Alexander matrices of knots, and of links. — Conjugacy of group automorphisms. — Plait representations of links. — A list of links.

Jean François COLOMBEAU. — **New generalized functions and multiplication of distributions.** — North-Holland mathematics studies, vol. 84. — Notas de matematica, vol. 90. — Un vol. broché, 16,5 × 24, de xiv, 376 p. — Prix: Dfl 100.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

This volume presents a new mathematical theory of generalized functions, more general than distribution theory, giving a rigorous mathematical sense to any product of a finite number of distributions and to heuristic computations of quantum field theory. Although the physical motivations are emphasized, the book is also addressed to mathematicians with no knowledge of physics. — *Contents*: Introduction to the multiplication of distributions. — A generalized mathematical analysis. — A mathematical setting for quantum field theory.

Albert WILANSKY. — **Summability through functional analysis.** — North-Holland mathematics studies, vol. 85. — Notas de matematica, vol. 91. — Un vol. broché, 16,5 × 24, de xii, 318 p. — Prix: Dfl 120.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

Matrices. — Classical matrices. — Triangles and Banach space. — FK spaces. — Replaceability and consistency. — Bigness theorems. — Sequence spaces. — Inclusion and mapping. — Semiconservative spaces and matrices. — Distinguished subspaces of

FK spaces. — Extension. — Distinguished subspaces of matrix domains. — Distinguished subspaces of c_A . — The functional μ . — The subspace P . — Sequential completeness and separability. — Maps of Banach spaces. — Algebra. — Miscellany.

Functions, series, operators. — Edited by B. Sz.-Nagy and J. Szabados. — *Colloquia mathematica societatis Janos Bolyai*, vol. 35. — 2 vol. reliés, $17,5 \times 24$, de 1308 p. pour l'ensemble des volumes. — Prix: Dfl 375.00 pour l'ensemble des volumes. — North-Holland publishing company, Amsterdam/Oxford/New York, 1984.

These proceedings contain most of the lectures presented at the international conference held in Budapest, August 22-28, 1980, which was held in honour of the centenary of the great Hungarian mathematicians Leopold Fejer and Frederic Riesz. The volumes include papers by P. Halmos, J.-P. Kahane, B. Sz.-Nagy and K. Tandori dealing with the lives and oeuvre of the two masters, as well as original research and survey papers by L. Berg, P. L. Butzer, L. Collatz, R. A. DeVore, N. Dunford, A. Edrei, P. Erdős, H. Grunsky, E. Hewitt, P. P. Korovkin, L. Lorch, H. J. Mertens, T. S. Motzkin, J. Musielak, R. J. Nessel, S. M. Nikolskii, J. Pal, J. D. Pincus, J. Prasad, I. J. Schoenberg, R. Sharpley, D. Szasz, H. Triebel, I. Vincze, W. Wilczynski, and others... many of them delivering a lecture in one of the following three sections: functions of real and complex variables, approximation theory and function series, operator theory.

André WEIL. — **Number theory: an approach through history: from Hammurapi to Legendre.** — Un vol. relié, $15 \times 22,5$, de XXI, 375 p. — Prix: FS 64.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

André Weil, one of the outstanding contributors of our time to number theory, examines texts that span roughly thirty-six centuries of arithmetical work, from an old Babylonian tablet, datable to the time of Hammurapi to Legendre's "Essai sur la théorie des nombres" (1798). Motivated by a desire to present the substance of his field to the educated reader, Weil employs an historical approach in the analysis of problems and evolving methods of number theory and their significance within mathematics. In the course of his study Weil accompanies the reader into the workshops of four major authors of modern number theory (Fermat, Euler, Lagrange and Legendre) and there he conducts a detailed and critical examination of their work. Enriched by a broad knowledge of intellectual history, "Number theory" represents a major contribution to the understanding of our cultural heritage.

Séminaire d'algèbre Paul Dubreil et Marie-Paule Malliavin. — Proceedings, Paris 1982 (35^e année). — Edité par M.-P. Malliavin. — Lecture notes in mathematics, vol. 1029. — Un vol. broché, $16,5 \times 24,5$, de v, 339 p. — Prix: DM 39.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

M. Hazewinkel: Lectures on invariants, representations and Lie algebras in systems and control theory. — *T. A. Springer*: Séries de Poincaré dans la théorie des invariants. — *G. Faltings*: On the cohomology of locally symmetric hermitian spaces. — *A. Van den Essen*: A study of the torsion-free part of the cokernel from the operator $\partial/\partial x_n$ acting on a \mathcal{D}_n -module. — *V. Dlab*: The regular representations of the tame hereditary algebras. — *C. M. Ringel*: Separating tubular series. — *G. B. Seligman*: Higher even Clifford algebras. — *J. Bartijn & J. R. Strooker*: Modifications monomiales. — *J. Lescot*: La série de Bass d'un produit fibré d'anneaux locaux. —

A. Verschoren: Relative invariants for commutative rings. — *J. Alev*: Sur l'extension $R^G \hookrightarrow R$. — *M. Chamarie*: Modules sur les anneaux de Krull non commutatifs. — *P. Hilton*: Localization of crossed-modules. — *R. L. Snider*: The division ring fractions of a group ring.

The mathematics and physics of disordered media: percolation, random walk, modeling and simulation. — Proceedings of a workshop held at the IMA, University of Minnesota, Minneapolis, February 13-19, 1983. — Edited by B. D. Hughes and B. W. Ninham. — Lecture notes in mathematics, vol. 1035. — Un vol. broché, 16,5 × 24,5, de vii, 431 p. — Prix: DM 49.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

The last decade has seen the beginnings of a unity of methods and approaches in statistical mechanics, transport in amorphous and disordered materials, properties of heterogeneous polymers and composites materials, turbulent flow, phase nucleation, and interfacial science. All have an underlying structure characterized in some sense by chaos, self-avoiding irregular walks, percolation and fractals. Some real progress has been made in understanding random walks and percolation processes on the one hand, and through mean field of effective medium approximation and simulation of liquids and porous media on the other. The subject is directly connected with the statistics of extreme events and important pragmatic areas like fracture of solids, comminution of particulate materials, and flow through porous media. In this volume, specialists in various aspects of theory and experiment, generalists concerned with synthesis from the diversity of disciplines, and mathematicians interested in developing some of the new mathematics needed, present their views of the foundations of disordered media.

Analytic functions, Blazejewko 1982. — Proceedings of a conference held in Blazejewko, Poland, August 19-27, 1982. — Edited by J. Lawrynowicz. — Lecture notes in mathematics, vol. 1039. — Un vol. broché, 16,5 × 24,5, de x, 494 p. — Prix: DM 62.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

The main emphasis in this collection of research and expository papers lies on extremal methods and their applications to various branches of complex analysis: one and several complex variables; quasiconformal mappings; and complex manifolds. In addition the volume includes a collection of open problems posed during the seminars corresponding to these four branches of the subject.

Linear and complex analysis problem book: 199 research problems. — Edited by V. P. Havin, S. V. Hruscev and N. K. Nikol'skii. — Lecture notes in mathematics, vol. 1043. — Un vol. broché, 16,5 × 24,5, de xviii, 721 p. — Prix: DM 68.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

This volume on unsolved problems from operator theory and complex analysis is the result of a concerted effort by a team of editors in Leningrad: starting with a pool of problems solicited from about 200 researchers world-wide, they have classified them according to subject, into chapters each with an introduction giving background and historical information, and presented each problem in the form of a mini-article together with an explanation of its ramifications and a discussion of possible modes of solution, with cross-references in many cases, and bibliographic references. This volume can be seen as a sequel to an analogous collection published in 1978, and in the final chapter, solutions are presented for some of the problems of that earlier volume which have been answered in the interim.

Eckart GEKELER. — **Discretization methods for stable initial value problems.** — Lecture notes in mathematics, vol. 1044. — Un vol. broché, $16,5 \times 24,5$, de viii, 201 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

In solving dynamical problems, one selects numerical methods which retain any stability properties of the exact solution. At the same time, however, if a system of partial differential equations is ill-conditioned, this feature also carries over to the corresponding semidiscrete systems of ordinary differential equations and stiff problems result. In the wake of the first papers by Dahlquist in 1963, a host of papers have appeared on the treatment of such problems. The present volume brings together new and recent results and surveys the current state of developments.

Differential geometry. — Proceedings of the international symposium held at Peniscola, Spain, October 3-10, 1982. — Edited by A. M. Naveira. — Lecture notes in mathematics, vol. 1045. — Un vol. broché, $16,5 \times 24,5$, de viii, 194 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Following the tradition of earlier meetings on Differential Geometry held in Spain (Santiago and Salamanca), the international symposium in Peniscola (1982) was devoted to the presentation and discussion of research on differential geometry and related topics by specialists from several European countries, the USA and Japan. The main topics of the communications were Riemannian geometry (submanifolds, homogeneous spaces, and integral geometry), complex and almost-complex manifolds; differential and pseudo-differential operators; Yang-Mills equations, foliations with applications to deformation theory and integral geometry; symplectic and contact manifolds and differential topology (characteristic classes and singularity theory).

Algebraic K-theory, number theory, geometry and analysis. — Proceedings of the international conference held at Bielefeld, FRG, July 26-30, 1982. — Edited by A. Bak. — Lecture notes in mathematics, vol. 1046. — Un vol. broché, $16,5 \times 24,5$, de ix, 464 p. — Prix: DM 55.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

It has become apparent over the last decade that algebraic K -theory is an interdisciplinary activity supplying a common methodological and conceptual basis for many distinct mathematical specializations. This volume contains survey and research articles relating algebraic K -theory to number theory, analysis, algebraic geometry and algebraic topology, as well as on algebraic K -theory itself. Topics treated include symbols in number theory, C^* -algebras, K -theory of sheaves, geometric cycles, characteristic classes, the Quillen-Lichtenbaum conjecture, surgery and L -theory, pseudo-isotopies and K_2 , the Adams e -invariant, stability theory, and K -theory of polynomial extensions.

Alexander PRESTEL; Peter ROQUETTE. — **Formally p -adic fields.** — Lecture notes in mathematics, vol. 1050. — Un vol. broché, $16,5 \times 24,5$, de v, 167 p. — Prix: DM 24.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

These notes resulted from lectures given by the authors at IMPA in Rio de Janeiro. They provide a complete and self-contained introduction to the theory of formally p -adic fields, in analogy to the Artin-Schreier theory of formally real fields. The notion of a formally p -adic field had been discovered in connection with the

work of Ax and Kochen on Artin's conjecture for homogeneous equations over \mathbb{Q}_p . Since then there has been a continuous development with remarkable applications and the time seems now appropriate for a systematic account.

M. LOTHAIRE. — **Combinatorics on words.** — Encyclopedia of mathematics and its applications, vol. 17. — Un vol. relié, 16,5 × 24, de xix, 238 p. — Addison-Wesley Publishing Co., Reading, Mass./London/Amsterdam/Don Mills, Ont./Sydney/Tokyo, 1983.

Combinatorics on words, or finite sequences, is a field which has grown simultaneously within disparate branches of mathematics such as group theory and probability. It has grown into an independent theory finding substantial applications in computer science, automata theory, and linguistics. This volume is the first attempt to present a thorough treatment of this theory. Topics discussed include: unavoidable regularities including A. Thue's square free words, Van der Waerden's theorem, Ramsey's theorem; factorization of free monoids including application to free Lie algebras; equations in words, etc.

H. O. FATTORINI. — **The Cauchy problem.** — Encyclopedia of mathematics and its applications, vol. 18. — Un vol. relié, 16,5 × 24, de xxii, 636 p. — Addison-Wesley Publishing Co., Reading, Mass./London/Amsterdam/Don Mills, Ont./Sydney/Tokyo, 1983.

This work deals with the Cauchy or initial value problem for linear differential equations. It treats in detail some of the applications of linear space methods to partial differential equations, especially the equations of mathematical physics such as the Maxwell, Schrödinger and Dirac equations. *Contents:* Elements of functional analysis. The Cauchy problem for some equations of Mathematical physics: the abstract Cauchy problem. Properly posed Cauchy problems: general theory. Dissipative operators and applications. Abstract parabolic equations: applications to second order parabolic equations. Perturbation and approximation of abstract differential equations. Some improperly posed Cauchy problems. The abstract Cauchy problem for time-dependent equations. The Cauchy problem in the sense of vector-valued distributions.

G. G. LORENTZ, K. JETTER, S. D. RIEMEN-SCHNEIDER. — **Birkhoff interpolation.** — Encyclopedia of mathematics and its applications, vol. 19. — Un vol. relié, 16,5 × 24, de lv, 237 p. — Addison-Wesley Publishing Co., Reading, Mass./London/Amsterdam/Don Mills, Ont./Sydney/Tokyo, 1983.

This work provides the main definitions, theorems and techniques in the theory of Birkhoff interpolation by polynomials. Some of the important developments in approximation and interpolation theory in the last twenty years are discussed, and all the basic material known at the present time is presented in a unified manner. *Contents:* Basic definitions and properties. Further elementary theorems. Coalescence of rows. Applications of coalescence. Rolle extensions and independent sets of knots. Singular matrices. Zeros of Birkhoff splines. Almost Hermitian matrices; special three-row matrices. Applications. Birkhoff quadrature formulas. Interpolation at the roots of unity. Turan's problem of (0, 2) interpolation. Birkhoff interpolation by splines. Regularity theorems and self-dual problems.

H. R. MARGOLIS. — **Spectra and the Steenrod algebra**: modules over the Steenrod algebra and the stable homotopy category. — North-Holland mathematical library, vol 29. — Un vol. relié, 15 × 23, de xix, 489 p. — Prix: Dfl 175.00. — North-Holland Publishing Co., Amsterdam/New York/Oxford, 1983.

This book is a study of the global structure of the stable homotopy category, with special attention to the parallel structure of this category and the category of modules over the Steenrod algebra. It is divided into 3 main parts. Part 1 is an axiomatic treatment of stable homotopy theory including a coherent presentation of most known and many new results of a global nature. Parts 2 and 3 are devoted to an examination of the global structure revealed by the connection to the module category provided by Z_p -cohomology. Part 3 is a systematic exposition of work on the “deep structure” of the category of modules over the mod 2 Steenrod algebra and the corresponding structure in the stable homotopy category.

Ann Hibner KOBLITZ. — **A convergence of lives: Sofia Kovalevskaia: scientist, writer, revolutionary**. — Un vol. relié, 16 × 24, de xx, 305 p. — Prix: FS 44.00. — Birkhäuser, Boston/Basel/Stuttgart, 1983.

The Russian mathematician Sofia Kovalevskaia (1850-1891) was the first woman in modern history to be awarded a doctorate in mathematics, the first to hold a chair in mathematics and the first ever to hold a position on the editorial board of a major scientific journal. Within a brief lifetime of forty-one years Kovalevskaia earned a reputation not only as a scientist, but as an accomplished writer, a proponent of women's rights and education and a champion of radical political causes in Western Europe and her native Russia. This work is the first biography in English to present a unified historical portrait of this extraordinary woman scientist.

Peter BLOOMFIELD, William L. STEIGER. — **Least absolute deviations: theory, applications and algorithms**. — Progress in probability and statistics, vol. 6. — Un vol. relié, 15,5 × 23,5, de xiv, 349 p. — Prix: FS 64.00. — Birkhäuser, Boston/Basel/Stuttgart, 1983.

Fitting methods based on the criterion of least absolute deviations (LAD) have important applications in many fields, including statistics and numerical analysis. Interesting algorithmic aspects are involved, as well as an attractive mathematical theory that intersects linear optimization and convex analysis. This volume provides a unified treatment of the theory, applications, and algorithms for LAD fitting, combining recent literature and new research material. The applications of LAD in regression and time series are of special interest in statistics and econometrics, and the material on LAD splines and algorithms is relevant to a variety of problems in statistical computing. — *Contents*: Historical and mathematical background. — LAD in linear regression, in autoregression, in multiway tables. — LAD spline fitting. — LAD and linear programming. — Algorithms for LAD.

Charles NASH, Siddharta SEN. — **Topology and geometry for physicists**. — Un vol. relié, 16 × 23,5, de x, 311 p. — Prix: £26.00. — Academic press, London/New York/Paris/San Diego/San Francisco/Sao Paulo/Sydney/Tokyo/Toronto, 1983.

One noticeable feature of theoretical physics of the last decade has been rapid growth of the use of topological and geometrical methods. The style and approach of this work reflect the fact that the authors are physicists. The level of rigour has,

in many cases, been appropriately lowered both to shorten arguments and to improve their clarity. — *Contents*: Basic notions of topology and the value of topological reasoning. Differential geometry, manifolds and differential forms. The fundamental group. The homology groups. The higher homotopy groups. Cohomology and De Rham cohomology. Fibre bundles and further differential geometry. Morse theory. Defects, textures and homotopy theory. Yang-Mills theories: instantons and monopoles.

Günter PILZ. — **Near-rings: the theory and its applications.** — Revised edition. — North-Holland mathematics studies, vol. 23. — Un vol. broché, 16,5 × 24, de XII, 474 p. — Prix: Dfl 140.00. — North-Holland publishing company, Amsterdam/Oxford/New York, 1983.

This book presents the first systematic and unified account of the present state of the theory of near-rings. Part one describes the elementary theory of near-rings, part two contains the structure theory (radicals, semi-simplicity) and part three discusses various special classes of near-rings (near-fields, distributively generated near-rings, planar near-rings). This edition contains a tremendous number of minor additions and corrections. Also, most of the results discovered after the first edition are in some way incorporated or at least touched upon in this new book. Four more chapters have been added. These concern regular near-rings, tame near-rings, bicentralizer near-rings and the connections between near-rings and automata. The chapter on polynomial near-rings has been substantially enlarged. The appendix contains an extensive bibliography with classifications and addresses, and included in this edition are 222 remarkable (counter) examples of near-rings.

Fred Wayne DODD. — **Number theory in the quadratic field with golden section unit.** — Examples of mathematical structures, vol. 3. — Un vol. relié, 15 × 22, de 159 p. — Prix: \$16.95. — Polygonal publishing house, Washington, N. J., 1983.

This is a monograph on the ring of algebraic integers in the quadratic extension field $Q(\sqrt{5})$. The book develops number theory in $Z(\omega)$. This development parallels that of ordinary number theory in Z and covers such topics as the division algorithm, units and primes, congruences, the Euler Φ -function, the Chinese remainder theorem, the Euler-Fermat theorem, primitive roots, indices and quadratic residues. — *Contents*: Elementary divisibility properties of $Z(\omega)$. — Units and primes. — Discriminants and integral bases. — Residue class arithmetic in \hat{Z} . — Algebraic congruences. — Primitive roots. — Quadratic residues. — Applications to rational integer theory. — Fibonacci numbers F_1 - F_{40} . — A list of primes. — A list of primitive roots.

Herbert PIEPER. — **Zahlen aus Primzahlen.** — 2., durchgesehene und erweiterte Auflage. — Mit Anhängen von H. Hasse und H. Reichardt. — Mathematische Miniaturen, Bd. 2. — Un vol. broché, 16,5 × 18, de 210 p. — Prix: FS 19.80. — Birkhäuser-Verlag, Basel/Boston/Stuttgart, 1984.

Diese mit wenigen Vorkenntnissen verständliche Einführung in die Zahlentheorie, eines der „reinsten und mathematischsten Gebiete der Mathematik“, erfordert vom Leser sorgfältige Mitarbeit, schrittweise Aneignung der mathematischen Kenntnisse und die Bereitschaft, die zahlentheoretischen Abstraktionen und Schlüsse nachvollziehen zu wollen. Dies gilt vor allem für das erste Kapitel, in dem einige Grundbegriffe der Zahlentheorie eingeführt werden. Mit ausserordentlichem didaktischen Einfühlungsvermögen erläutert und erklärt der Autor sodann anhand ausführlicher Rechen-

beispiele den Begriff der p -adischen Zahlen, der erst im 20. Jahrhundert entstanden ist und in den letzten Jahrzehnten in Teilgebieten der Mathematik grosse Bedeutung gewonnen hat. Eine Würdigung von Kurt Hensel, des „Erfinders“ der p -adischen Zahlen, ergänzt und bereichert im Anhang diese mathematische Miniatur.

Annales de l'Institut Henri Poincaré: analyse non linéaire = nonlinear analysis. — Nouvelle revue de mathématiques de haut niveau. — ISSN: 0294-1449. — Format: $15,5 \times 24$. — Prix de l'abonnement annuel (6 fascicules): FF 610.00 pour la France, et FF 795.00 pour tout autre pays. — Gauthier-Villars, Paris, volume 1, 1984, diffusé par C. D. R. — Centrale des revues, 11, rue Gossin, 92543 Montrouge cedex, France.

Sommaire du premier numéro: *P. H. Rabinowitz*: A rapid convergence method for a singular perturbation problem. — *I. Ekeland*: Une théorie de Morse pour les systèmes hamiltoniens convexes.

Spatial statistics and models. — Edited by Gary L. Gaile and Cort J. Willmott. — Theory and decision library, vol. 40. — Un vol. relié, $15,5 \times 23$, de x, 482 p. — Prix: Dfl 190.00. — D. Reidel publishing company, Dordrecht/Boston/Lancaster, 1984.

In the last decade, geographers have expanded their methodological bag of tools by developing quantitative techniques which are specifically directed towards analysis of explicitly spatial problems. Mathematicians, geologists, economists and regional scientists have shared the geographer's interest in the incorporation of explicitly spatial components into their analytical tools. This volume is a sampling of state-of-the-art papers on topics dealing directly or indirectly with spatial phenomena or processes. The interests of the contributors are highly diverse, e.g. geology, geomorphology, climatology, cartography, human geography, population and migration, urban geography, economic geography, and methodology. The vast majority of the papers included fit equations to data.

Zum Werk Leonhard Eulers: Vorträge des Euler-Kolloquiums in Mai 1983 in Berlin. — Herausgegeben von E. Knobloch, I. S. Louhivaara, J. Winkler. — Un vol. relié, 18×24 , de xi, 238 p. — Prix: FS 68.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

Berichte über Entwicklungen in der mathematischen Analysis seit Euler: Heinz Bauer: Zum heutigen Bild der Potentialtheorie. — *Stefan Hildebrandt*: Euler und die Variationsrechnung. — *Historische Bezüge des Werkes von Euler: Emil A. Fellmann*: Ueber einige mathematische Sujets im Briefwechsel Leonhard Eulers mit Johann Bernoulli. — *Christoph J. Scriba*: Eulers zahlentheoretische Studien im Lichte seines wissenschaftlichen Briefwechsels. — *René Taton*: Euler et d'Alembert. — *Ueberblicke zum jetzigen Stand analytischer Forschungsgebiete Eulers: Albert Baernstein II*: Recent progress in Nevanlinna's theory of meromorphic functions. — *P. L. Butzer*: Some recent applications of functional analysis to approximation theory. — *Aurel Cornea*: Geordnete konvexe Kegel in der Potentialtheorie. — *Gerd Grubb*: On the functional calculus of pseudo-differential boundary problems. — *Günther Hämmerlin*: Entwicklungen bei der praktischen Behandlung von Integralgleichungen. — *Erhard Heinz*: Zum Plateauschen Problem für Polygone. — *Olli Lehto*: A historical survey of quasi-conformal mappings. — *Kurt Strebel*: Quadratic differentials: a survey.

E. RAMIS, C. DESCHAMPS et J. ODOUX. — **Analyse: exercices avec solutions, vol. 1.** — Classes préparatoires aux grandes écoles scientifiques. — Un vol. broché,

16 × 24, de 190 p. — Masson, Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1984.

Réels. Suites: Réels. Suites numériques. — *Topologie*: Topologie générale. Espaces métriques. Espaces vectoriels normés. — *Fonctions d'une variable réelle*: Limites; continuité. Dérivées; Rolle; Taylor. Développements limités. Etude pratique d'une fonction. — *Intégrale*: Intégrale de Riemann. Calcul de primitives et d'intégrales. Intégrales impropres. — *Séries numériques*: Séries à termes positifs. Séries numériques quelconques.

Patrice LIGNELET. — **Fortran 77. Langage Fortran V.** — 2^e édition. — Un vol. broché, 16,5 × 24, de 189 p. — Masson, Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1984.

Notions fondamentales: Eléments de base du langage. Les types de données. Les premiers pas: lire, écrire, calculer. — *Structure des programmes*: Test et choix. Les boucles. — Les procédures: sous-programmes et fonctions. — *Les données structurées*: Les tableaux. Les fichiers séquentiels. Les fichiers à accès direct. Entrées-sorties dirigées par un format. — *Annexes*: Extensions au Fortran 77. Table des caractères ASCII. Lexique des mots-clefs du Fortran 77.

Max MORAND. — **Espaces fibrés et structure de la mécanique classique ou quantique.** — Fondation Singer-Polignac. — Un vol. broché, 16 × 24, de 141 p. — Masson, Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1984.

Introduction géométrique: Rappels concernant un ensemble de notions géométriques de base. Structure de groupes et symétrie d'un espace vectoriel. Structure de la mécanique et symétrie propre à ses espaces. Formulation homéosymétrique du principe de relativité. — *La fusion quantique des translations des espaces vectoriels de la mécanique de Newton et ses conséquences*: Fusion vectorielle et nouvelle fusion relative aux espaces vectoriels de base. Les équations fonctionnelles de la fusion quantique, leurs solutions analytiques et leurs conséquences. Remarques sur la mécanique quantique applicable aux phénomènes mécaniques non relativistes. — *Forme spinorielle de la fusion modulaire des groupes orthogonaux des espaces vectoriels de base*: Anneau et espace définis par la fusion des groupes orthogonaux des espaces vectoriels de base. Représentation spinorielle de la fusion des groupes orthogonaux des espaces vectoriels de base. Structure fondamentale de la mécanique, constantes de structure, homéosymétrie généralisant le principe de relativité.

Robert AZENCOTT, Didier DACUNHA-CASTELLE. — **Séries d'observations irrégulières: modélisation et prévision.** — Collection « Techniques stochastiques ». — Un vol. broché, 16 × 24, de 200 p. — Prix: FF 120.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1984.

Processus aléatoires à temps discret. — Processus gaussiens. — Processus stationnaires. — Prédiction et stationnarité. — Champs aléatoires et intégrales stochastiques. — Représentation spectrale des processus stationnaires. — Filtres linéaires. — Processus ARMA et processus à spectre rationnel. — Processus ARMA non stationnaire et prédiction. — Estimateurs empiriques et périodogramme. — Estimateurs empiriques des paramètres d'un processus ARMA à spectre rationnel. — Estimation efficace des paramètres d'un processus à spectre rationnel. — Maximum de vraisemblance asymptotique. — Identification et vraisemblance compensée. — Quelques problèmes non abordés.

Handbook of statistics, vol. 3: Time series in the frequency domain. — Edited by D. R. Brillinger, P. R. Krishnaiah. — Un vol. relié, $17 \times 24,5$, de xiv, 485 p. — Prix: Dfl 250.00. — North-Holland, Amsterdam/New York/Oxford, 1983.

R. J. Bhansali and D. Karavellas: Wiener filtering (with emphasis on frequency-domain approaches). — *D. R. Brillinger*: The finite Fourier transform of a stationary process. — *W. S. Cleveland*: Seasonal and calendar adjustment. — *R. B. Davies*: Optimal inference in the frequency domain. — *C. W. Granger and R. Engle*: Applications of spectral analysis in econometrics. — *E. J. Hannan*: Signal estimation. — *T. Hasan*: Complex demodulation: some theory and applications. — *M. J. Hinich*: Estimating the gain of a linear filter from noisy data. — *L. H. Koopmans*: A spectral analysis primer. — *R. D. Martin*: Robust-resistant spectral analysis. — *E. Parzen*: Autoregressive spectral estimation. — *J. Pemberton and H. Tong*: Threshold autoregression and some frequency-domain characteristics. — *M. B. Priestley*: The frequency-domain approach to the analysis of closed-loop systems. — *T. Subba Rao*: The bispectral analysis of nonlinear stationary time series with reference to bilinear time-service models. — *E. A. Robinson*: Frequency-domain analysis of multidimensional time-series data. — *P. M. Robinson*: Review of various approaches to power spectrum estimation. — *M. Rosenblatt*: Cumulants and cumulant spectra. — *R. H. Shumway*: Replicated time-series regression: an approach to signal estimation and detection. — *T. Thrall*: Computer programming of spectrum estimation. — *P. R. Krishnaiah, J. C. Lee and T. C. Chang*: Likelihood ratio tests on covariance matrices and mean vectors of complex multivariate normal populations and their applications in time series.

Lie group representations II. — Proceedings of the special year held at the University of Maryland, College Park 1982-1983. — Edited by R. Herb, S. Kudla, R. Lipsman and J. Rosenberg. — Lecture notes in mathematics, vol. 1041. — Un vol. broché, $16,5 \times 24$, de ix, 340 p. — Prix: DM 39.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

J. Arthur: On some problems suggested by the trace formula. — *J. N. Bernstein*: P -invariant distributions on $GL(N)$ and the classification of unitary representations of $GL(N)$ (non-archimedean case). — *W. Casselmann*: Automorphic forms and a Hodge theory for congruence subgroups of $SL_2(\mathbb{Z})$. — *S. Gelbart and I. Piatetski-Shapiro*: Automorphic forms and L -functions for the unitary group. — *H. Jacquet*: On the residual spectrum of $GL(n)$. — *D. Kazhdan*: On lifting. — *R. Langlands and D. Shelstad*: On principal values on p -adic manifolds. — *I. Piatetski-Shapiro*: Work of Waldspurger. — *P. J. Sally, Jr. and J. A. Shalika*: The Fourier transform of orbital integrals on SL_2 over a p -adic field.

Fluid dynamics. — Lectures given at the 3rd 1982 session of the Centro Internazionale Matematico Estivo (C.I.M.E.) held at Varenna, Italy, August 22-September 1, 1982. — Edited by H. Beirao da Veiga. — Lecture notes in mathematics, vol. 1047. — Un vol. broché, $16,5 \times 24$, de vii, 193 p. — Prix: DM 24.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

C. Bardos: Introduction aux problèmes hyperboliques non linéaires. — *A. Majda*: Smooth solutions for the equations of compressible and incompressible fluid flow. — *G. Geymonat, P. Leyland*: The linear transport operator of fluid dynamics. — *A. Lagha-Benabdallah*: Limites des équations d'un fluide compressible lorsque la compressibilité tend vers zéro. — *C. Marchioro*: Vortex theory and Euler and Navier-

Stokes evolution in two dimensions. — *A. Valli*: Free boundary problems for compressible viscous fluids.

Bruno IOCHUM. — **Cônes autopolaires et algèbres de Jordan.** — Lecture notes in mathematics, vol. 1049. — Un vol. broché, 16,5 × 24, de vi, 247 p. — Prix: DM 33.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Cônes autopolaires. — Cônes autopolaires facialement homogènes. — L'algèbre de Jordan d'un cône autopolaire facialement homogène. — Poids sur un cône autopolaire. — Traces sur les J.B. algèbres. — Cônes orientables. — Cônes associés aux J.B.W. algèbres. — Appendices.

Algebraic topology, Aarhus 1982. — Proceedings of a conference held in Aarhus, Denmark, August 1-7, 1982. — Edited by I. Madsen and B. Oliver. — Lecture notes in mathematics, vol. 1051. — Un vol. broché, 16,5 × 24, de x, 665 p. — Prix: DM 69.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

The main themes of the conference and of these proceedings are algebraic K - and L -theory, geometry of manifolds, homotopy theory and transformation groups. — From the contents: *F. T. Farrell, W. C. Hsiang*: On Novikov's conjecture for cocompact discrete subgroups of a Lie-group. — *F. Waldhausen*: Algebraic K -theory of spaces, localization, and the chromatic filtration of stable homotopy. — *M. Davis*: Coxeter groups and aspherical manifolds. — *M. Kreck*: Some closed 4-manifolds with exotic differentiable structure. — *J. F. Adams*: Prerequisites (on equivariant theory) for Carlsson's lecture. — *D. Anderson, E. Pedersen*: Semi-free topological actions of finite groups on spheres. — *J. P. May*: The completion conjecture in equivariant cohomology. — *P. Vogel*: On Steenrod's problem for non-abelian finite groups.

Peter J. HILTON. — **Nilpotente Gruppen und nilpotente Räume: Nachdiplomvorlesung gehalten am Mathematik-Department ETH Zürich 1981/82.** — Aufzeichnungen von Markus Pfenniger. — Lecture notes in mathematics, vol. 1053. — Un vol. broché, 16,5 × 24, de v, 221 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Einleitung. — Endliche und nilpotente Gruppen. — Allgemeine Eigenschaften nilpotenter Gruppen. — Endlich erzeugte nilpotente Gruppen. — Lokalisierung abelscher Gruppen, nilpotenter Gruppen. — Lokalisierung einfach zusammenhängender CW-Komplexe. — Lokalisierung nilpotenter CW-Komplexe.

Gennadi HENKIN, Jürgen LEITERER. — **Theory of functions on complex manifolds.** — Monographs in mathematics, vol. 79. — Un vol. relié, 17 × 24, de 226 p. — Prix: FS 68.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

The theory of functions of several complex variables is usually developed on the basis of the sheaf theory of the $\bar{\partial}$ -Neumann problem. In the seventies global integral formulas turned out to be the natural method for solving several problems in this theory. Moreover, these formulas made it possible to build up a large part of the theory in a new and more constructive way. This book presents a new introduction to the theory of functions of several complex variables with strengthened reasoning supporting the main results: uniform and Hölder estimates for the Cauchy-Riemann equation, bounded extension of bounded holomorphic functions from submanifolds,

uniform approximation of holomorphic functions which are continuous on the boundary... This approach can be considered a direct continuation of the work done by K. Oka between the years 1936 and 1951. — *Contents*: Elementary properties of functions of several complex variables. — The $\bar{\partial}$ -equation and the “fundamental problems” of the theory of functions on Stein manifolds. — Theory of functions on strictly pseudoconvex sets with non-smooth boundary in \mathbb{C}^n . — Global integral formulas on Stein manifolds and applications. — Estimation of some integrals. — On Banach’s open mapping theorem.

Joseph DIESTEL. — **Sequences and series in Banach spaces.** — Graduate texts in mathematics, vol. 92. — Un vol. relié, 16 × 24,5, de XIII, 261 p. — Prix: DM 108.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

Riesz’s lemma and compactness in Banach spaces. — The weak and weak* topologies: an introduction. — The Eberlein-Smulian theorem. — The Orlicz-Pettis theorem. — Basic sequences. — The Dvoretzky-Rogers theorem. — The classical Banach spaces. — Weak convergence and unconditionally convergent series in uniformly convex spaces. — Extremal tests for weak convergence of sequences and series. — Grothendieck’s inequality and the Grothendieck-Lindenstrauss-Pelczynski cycle of ideas. — Rosenthal’s l_1 -theorem. — The Josefson-Nissenzweig theorem. — Banach spaces with weak*-sequentially compact dual balls. — The Elton-Odell $(l + \varepsilon)$ -separation theorem.

B. A. DUBROVIN, A. T. FOMENKO and S. P. NOVIKOV. — **Modern geometry: methods and applications, Part 1: The geometry of surfaces, transformation groups, and fields.** — Transl. by Robert G. Burns. — Graduate texts in mathematics, vol. 93. — Un vol. relié, 16 × 24,5, de xv, 464 p. — Prix: DM 128.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This is the first in a three volume treatise on modern geometry, leading the reader from elementary beginnings to many questions of current research interest, particularly in applied mathematics and mathematical physics. It contains discussions of topics such as Riemannian geometry, the reduction of dynamical systems to smaller ones and the appearance of deformations of Lie algebras appearing in the Kepler problem by restricting different classes of integrals to different level sets. The general topics of this first volume are the geometry of Euclidian and Minkowski space and their transformation groups, the classical geometry of curves and surfaces, tensor analysis and Riemannian geometry, the calculus of variations and field theory, and the fundamentals of the theory of relativity. — *Contents*: Geometry in regions of a space. Basic concepts. — The theory of surfaces. — Tensors: the algebraic theory. — The differential calculus of tensors. — The elements of the calculus of variations. — The calculus of variations in several dimensions. — Fields and their geometric invariants.

Annals of global analysis and geometry, vol. 1, 1983. — Nouvelle revue de mathématiques de haut niveau. — ISSN 0617-8043. — Format: 16,5 × 24. — Prix: Dfl 150.00. — VEB Deutscher Verlag der Wissenschaften, Berlin, North-Holland, Amsterdam.

The “Annals of global analysis and geometry” are intended to contribute to an enlargement of the international exchange of research results in the fields of global analysis and geometry and their applications to problems of theoretical physics. The

areas covered include: global analysis, differential geometry, complex manifolds and related results from complex analysis and algebraic geometry, Lie groups, Lie transformation groups and harmonic analysis, applications of differential geometry and global analysis to problems of theoretical physics.

HARISH-CHANDRA. — **Collected papers, vol. 1: 1944-1954, vol. 2: 1955-1958, vol. 3: 1959-1968, vol. 4: 1970-1983.** — Edited by V. S. Varadarajan. — 4 vol. reliés, 17 × 25, de XLII, 2236 p. — Prix: DM 398.00 pour l'ensemble des 4 vol. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

From the introduction by V. S. Varadarajan: "The first scientific papers of Harish-Chandra were in theoretical physics. However, his interests shifted to mathematics rather early in his career. His prolonged and intense preoccupation with group representations began in the late 1940's when at the suggestion of Dirac, he started investigating the infinite dimensional unitary representations of the Lorentz group. Since then he has erected, almost singlehandedly, a monumental theory of harmonic analysis on reductive groups and their homogeneous spaces. His work is a profound synthesis of algebra, geometry and analysis. The great force and continued resonance of his ideas have inspired a generation of mathematicians... There can be no doubt that his achievement is one of the greatest in mathematics in our time". — The Springer edition of Harish-Chandra's collected papers contains all the scientific papers Harish-Chandra has published to date, and "final" versions of several new papers which circulated as manuscripts but which were never published, among them: The Plancherel formula for reductive p -adic groups. — Some results on differential equations. — Differential equations and semisimple Lie groups. Harish-Chandra's work is important to several areas of mathematics, especially number theory and the theory of group representations and this edition will be of lasting interest to libraries and specialists in those areas of research.

A. N. SHIRYAYEV. — **Probability.** — Translated by R. P. Boas. — Graduate texts in mathematics, vol. 95. — Un vol. relié, 16,5 × 24, de XI, 577 p. — Prix: DM 148.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This volume comprises an uncommonly complete and systematic treatment of probability from the ground up: starting with intuitive ideas, establishing a rigorous basis in measure theory, and gradually developing some of the most sophisticated topics, such as random walks, martingales, Markov chains, ergodic theory, weak convergence of probability measures, stationary stochastic processes, Wold's expansion, and the Kalman-Bucy filter... etc. The treatment of integration is self-contained. The law of large numbers and the central limit theorem are presented in general versions. Many examples are discussed in detail, and there are a large number of exercises. — *Contents:* Elementary probability theory. — Mathematical foundations of probability theory. — Convergence of probability measures. Central limit theorem. — Sequence and sums of independent random variables. — Stationary (strict sense) random sequences and ergodic theory. — Stationary (wide sense) random sequences. L^2 theory. — Sequences of random variables that form martingales. — Sequences of random variables that form Markov chains.

J. L. DOOB. — **Classical potential theory and its probabilistic counterpart.** — Grundlehren der mathematischen Wissenschaften, vol. 262. — Un vol. relié, 16,5 × 24,

de xx, 846 p. — Prix: DM 168.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

Introduction to the mathematical background of classical potential theory. — Basic properties of harmonic, subharmonic, and superharmonic functions. — Infima of families of superharmonic functions. — Potentials on special open sets. — Polar sets and their applications. — The fundamental convergence theorem and the reduction operation. — Green functions. — The Dirichlet problem for relative harmonic functions. — Lattices and related classes of functions. — The sweeping operation. — The fine topology. — The Martin boundary. — Classical energy and capacity. — One-dimensional potential theory. — Parabolic potential theory. — Subparabolic, superparabolic, and parabolic functions on a slab. — The parabolic Dirichlet problem, sweeping, and exceptional sets. — The Martin boundary in the parabolic context. — Fundamental concepts of probability. — Optional times and associated concepts. — Elements of martingale theory. — Basic properties of continuous parameter supermartingales. — Lattices and related classes of stochastic processes. — Markov processes. — Brownian motion. — The Itô integral. — Brownian motion and martingale theory. — Conditional Brownian motion. — Lattices in classical potential theory and martingale theory. — Brownian motion and the *PWB* method. — Brownian motion on the Martin space. — *Appendices*: Analytic sets. Capacity theory. Lattice theory. Lattice theoretic concepts in measure theory. Uniform integrability. Kernels and transition functions. Integral limit theorems. Lower semicontinuous functions.

David GILBARG, Neil S. TRUDINGER. — **Elliptic partial differential equations of second order.** — 2nd edition. — Grundlehren der mathematischen Wissenschaften, vol. 224. — Un vol. relié, 16,5 × 24, de XIII, 513 p. — Prix: DM 128.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1983.

Linear equations: Laplace's equation. The classical maximum principle. Poisson's equation and the Newtonian potential. Banach and Hilbert spaces. Classical solutions the Schrauder approach. Sobolev spaces. Generalized solutions and regularity. Strong solutions. — *Quasilinear equations*: Maximum and comparison principles. Topological fixed point theorems and their applications. Equations in two variables. Hölder estimates for the gradient. Boundary gradient estimates. Global and interior gradient bounds. Equations of mean curvature type. Fully nonlinear equations. — In this edition the authors have made minor revisions and added new material, including two chapters taking account of recent developments in the linear and nonlinear theory.

Kurt STREBEL. — **Quadratic differentials.** — Ergebnisse der Mathematik und ihrer Grenzgebiete, 3. Folge, Bd. 5. — Un vol. relié, 17 × 25, de XII, 184 p. — Prix: DM 98.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

The book deals at length with quadratic differentials on a fixed Riemann surface. Both the local theory of trajectories of a quadratic differential and the global theory are treated. The integration of quadratic differentials is performed by a conformal mapping and analytic continuation, an easier method than the use of differential equations. The differential geometric metric defined by the quadratic differentials is discussed in details. One chapter is devoted exclusively to quadratic differentials with closed trajectories. Here known theorems are presented in a new light and supplemented by essential new results. — *Contents*: Background material on Riemann

surfaces. — Quadratic differentials. — Local behaviour of the trajectories and the ϕ -metric. — Trajectory structure in the large. — The metric associated with a quadratic differential. — Quadratic differentials with closed trajectories. — Quadratic differentials of general type.

Nathan KEYFITZ, John A. BEEKMAN. — **Demography through problems.** — Problem books in mathematics. — Un vol. relié, 16 × 24, de VIII, 141 p. — Prix: DM 78.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This book is concerned with population projections, the life table, stable age distribution results, births and deaths under stability, projection and forecasting, kinship, stochastic population models, birth and conception, and spatial aspects of population. "Demography through problems" presents a new approach to the teaching of population theory and analysis. Each chapter contains a brief introduction to the appropriate theory, followed by a sequence of problems and partial or complete solutions. Over 450 problems secure the active participation of the learner in mastering the nine major themes of the book. Some of the solutions are in terms of *BASIC* computer programs, and illustrate numerical results obtainable from census data.

Topics in operator theory systems and networks. — Workshop on applications of linear operator theory to systems and networks, Rehovot, Israel, June 13-16, 1983. — Edited by H. Dym, I. Gohberg. — Operator theory, vol. 12. — Un vol. relié, 17 × 24, de 384 p. — Prix: FS 84.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

These proceedings include a representative sample of many of the problems which are currently under active investigation by electrical engineers and mathematicians, and of the techniques which are used to deal with them, as well as much expository material. The range of topics include Wiener-Hopf and other integral equations, the theory and application of factorization and interpolation, Riccati equations, scattering theory, Hilbert spaces of analytic functions, inverse spectral problems, and dilation theory, to cite just a few.

Abdel-Ilah BENABDALLAH. — **Opérateurs différentiels invariants.** — Travaux en cours. — Un vol. broché, 17 × 24, de 112 p. — Prix: FF 110.00. — Hermann, Paris, 1984.

L'un des thèmes majeurs de l'analyse harmonique est l'étude des représentations des groupes de Lie et des opérateurs différentiels invariants. L'auteur se propose dans cet ouvrage de déterminer les coefficients des représentations de certains groupes classiques ainsi que les sections propres communes à tous les opérateurs différentiels invariants sur un fibré homogène. Les méthodes utilisées reposent sur l'étude d'équations différentielles dont les solutions sont des intégrales d'Eisenstein.

Jean VAILLANT. — **Equations aux dérivées partielles hyperboliques et holomorphes: séminaire.** — Travaux en cours. — Un vol. broché, 17 × 24, de 192 p. — Prix: FF 130.00. — Hermann, Paris, 1984.

Ce séminaire, qui a pris la suite de celui de Leray, aborde les équations aux dérivées partielles en insistant sur les aspects hyperboliques et holomorphes. On examine ainsi des phénomènes de propagation et les aspects formels algébriques. Le

travail témoigne non seulement de la vivacité de la recherche dans ce domaine, mais de la fertilité des échanges de réflexions entre les équipes de Paris, Liège, Pise et Kyoto.

Séminaire Sud-Rhodanien de géométrie III: géométrie symplectique et de contact: autour du théorème de Poincaré-Birkhoff. — Journées lyonnaises de la Société mathématique de France, 14-17 juin 1983. — Edité par P. Dazord, N. Desolneux-Moulis. — Travaux en cours. — Un vol. broché, 17 × 24, de 176 p. — Prix: FF 110.00. — Hermann, Paris, 1984.

D. Bennequin: Quelques remarques simples sur la rigidité symplectique. — *M. Chaperon, C. Conley et E. Zehnder*: Quelques résultats globaux en géométrie symplectique. — *Y. Colin de Verdières*: Sur les longueurs des trajectoires périodiques d'un billard. — *A. Weinstein*: C^0 perturbation theorems for symplectic fixed points and lagrangian intersections. — *C. Barbance*: Transformations conformes d'une variété kählérienne. — *A. Medina et P. Revoy*: Caractérisation des groupes de Lie avec une pseudo-métrique bi-invariante. Applications.

Henry HELSON. — **Harmonic analysis.** — Un vol. relié, 17 × 24, de XII, 190 p. — Addison-Wesley publishing company, Reading, Mass./London/Amsterdam/Don Mills, Ont./Sydney/Tokyo, 1983.

This book provides a coherent, simply presented introduction to this active mathematical field, organized so that the reader can find a desired piece of information and follow the argument without much preliminary work. The book is designed as an upper-level text for courses in harmonic analysis of Fourier series, but it is also useful as a reference work for physicists and engineers. — *Contents*: Fourier series and integrals. — The Fourier integral. — Hardy spaces. — Conjugate functions. — Translation. — Distribution.

Alain ROBERT. — **Pour comprendre l'analyse non standard.** — Un vol. broché, 14,5 × 20,5, de 119 p. — Université de Neuchâtel (Suisse), 1984.

Ce texte s'adresse aux étudiants en mathématiques des universités et aux enseignants du degré secondaire qui souhaitent apprendre ce qu'est l'analyse non standard et comment l'utiliser. Il comprend de nombreux exercices. — *Table des matières*: Introduction: Euler. — Axiomatique de Nelson: Idéalisation et Transfert. — Nombres réels et fonctions numériques, continuité, différentiabilité, intégration. — Moyennes invariantes sur Z . — Approximation des fonctions. — Equations différentielles: théorème d'existence local. — Perturbation d'une fonction de Green. — Problème des sous-espaces invariants.

Optimal control of partial differential equations. — Conference held at the Mathematisches Forschungsinstitut, Oberwolfach, December 5-11, 1982. — Edited by K.-H. Hoffmann, W. Krabs. — International series of numerical mathematics, vol. 68. — Un vol. relié, 17 × 24, de 261 p. — Prix: FS 62.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

This volume deals specifically with free boundary value problems including multiphase-Stefan problems, hyperbolic problems with free boundaries as well as identification problems and the control of hyperbolic and parabolic processes. Nume-

rical aspects of optimal control, gradient methods, Ritz methods and their convergence behaviour are treated and a number of concrete subjects such as heat propagation, optimal design, finite element methods are explored in depth.

Ruel V. CHURCHILL, James Ward BROWN. — **Complex variables and applications.** — 4th edition. — Un vol. relié, 17×24 , de x, 339 p. — Prix: DM 95.80. — McGraw-Hill Book Company, New York / St. Louis / San Francisco / Auckland / Bogota / Hamburg / Joannesburg / London / Madrid / Mexico / Montreal / New Delhi / Panama / Paris / Sao Paulo / Singapore / Sydney / Tokyo / Toronto, 1984.

Contents: Complex numbers. — Analytic functions. — Elementary functions. — Integrals. — Series. — Residues and poles. — Mapping by elementary functions. — Conformal mapping. — Applications of conformal mapping. — The Schwarz-Christoffel transformation. — Integral formulas of the Poisson type. — Further theory of functions. — *From the prefaces:* "... the first objective of this edition is to develop in a rigorous and self-contained manner those parts of the theory which are prominent in the application of the subject. The second objective is to furnish an introduction to applications of residues and conformal mapping. Special emphasis is given to the use of conformal mapping in solving boundary value problems which arise in studies of heat conduction, electrostatic potential, and fluid flow".

Corneliu CONSTANTINESCU. — **Spaces of measures** — De Gruyter studies in mathematics, vol. 4. — Un vol. relié, $18 \times 24,5$, de 444 p. — Prix: DM 128.00. — Walter de Gruyter, Berlin/New York, 1984.

The theory of spaces of measures arose from the following five classical results of measure theory: Nikodym's convergence theorem, Orlicz-Pettis theorem, Nikodym's boundedness theorem, Vitali-Hahn-Saks theorem, and Phillips' lemma. It is presented here for the first time in a systematic way, which permits a unified approach to the vast literature on generalizations of the above classical results in many directions. Subseries summable sequences (and families), as well as exhaustive and σ -additive measures (on abstract or on topological spaces), are the main objects. Applications of the theory to locally convex vector lattices (including the DP -[Dunford-Pettis]-property and the D -[Dieudonné]-property for these spaces) are given in a final chapter. — *Contents:* Topological preliminaries. — Spaces of functions. — Spaces of supersummable families. — Spaces of measures. — Locally convex lattices.

W. KLINGENBERG. — **Lineare Algebra und Geometrie.** — Hochschultext. — Un vol. broché, $16,5 \times 24$, de xi, 313 p. — Prix: DM 32.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Allgemeine Grundbegriffe. — Vektorräume. — Matrizen. — Lineare Gleichungen und Determinanten. — Eigenwerte und Normalformen. — Metrische Vektorräume. — Affine Geometrie. — Euklidische Geometrie. — Projektive Geometrie. — Nicht-euklidische Geometrie. — Der Autor gibt im ersten Teil eine kurze Darstellung der linearen und bilinearen Algebra; Beispiele und Ergänzungen stammen dabei vorwiegend aus der Analysis. Im zweiten, umfangreicheren Teil werden die Grundlagen für die klassische Geometrie gelegt und durch mannigfache Einzelresultate ergänzt und erläutert; genannt seien hier Berührkreise von Dreiecken, Kegelschnitte, Quadriken, Dandelinsche Sphären.

Jacques DOUCHET et Bruno ZWAHLEN. — **Calcul différentiel et intégral. Tome 1:** Fonctions réelles d'une variable réelle. — Un vol. broché, 16 × 24, de 244 p. — Lausanne, Presses polytechniques romandes, 1983.

Introduction. — Corps des nombres réels. — Suite de nombres réels. — Séries numériques. — Fonctions réelles d'une variable réelle. — Calcul différentiel. — Fonction exponentielle et fonction logarithme. — Calcul intégral. — Intégrales généralisées. — Equations différentielles. (Nombreux exercices à la fin de chaque chapitre.)

B. G. MIRKIN and S. N. RODIN. — **Graphs and genes.** — Translated from the Russian by H. Lynn Beus. — *Biomathematics*, vol. 2. — Un vol. relié, 17 × 25, de xiv, 197 p. — Prix: DM 69.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Graphs in the analysis of gene structure: Gene systems and their maps. The mathematical theory of linear maps: interval graphs. The mathematical theory of linear maps: interval hypergraphs. Linear mapping algorithms. Examples of structural analysis of genetic systems. — *Graphs in the analysis of gene semantics:* Interallelic complementation and the functioning of protein multimers. The approximation of graphs. Analyzing the spatio-functional organization of specific genetic systems. — *Graphs in the analysis of gene evolution:* Trees and phylogenetic trees. The evolution of families of synonymous proteins. — *Epilogue:* Cryptographic problems in genetics.

Kazimierz GOEBEL & Simeon REICH. — **Uniform convexity, hyperbolic geometry, and nonexpansive mappings.** — Pure and applied mathematics: a series of monographs and textbooks, vol. 83. — Un vol. relié, 16 × 23,5, de ix, 170 p. — Prix: FS 96.00. — Marcel Dekker, New York/Basel, 1984.

This volume performs an unusual function in the mathematical literature, linking two seemingly unrelated theories. In exploring the connections between the theory of holomorphic mappings and the theory of nonexpansive mappings, it links the two in an innovative approach that reveals the facts that holomorphic mappings are nonexpansive with respect to certain pseudometrics, and that the concept of uniform convexity turns out to play a central role in both theories.

Functional analysis, holomorphy and approximation theory II. — Proceedings of the Seminario de análise funcional, holomorfia e teoria da aproximação, Universidade federal do Rio de Janeiro, August 3-7, 1981. — Ed. by Guido I. Zapata. — North-Holland mathematics studies, vol. 86 / Notas de matemática, vol. 92. — Un vol. broché, 16,5 × 24, de x, 477 p. — Prix: US\$57.75/Dfl 150.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

R. Arocena: On generalized Toeplitz kernels and their relation with a paper of Adamjan, Arov and Krein. — *R. M. Aron and C. Herves:* Weakly sequentially continuous analytic functions on a Banach space. — *A. Defant and K. Floret:* The precompactness-lemma for sets of operators. — *Z. Ditzian:* On Lipschitz classes and derivative inequalities in various Banach spaces. — *F. A. Doria:* A stratification associated to the copy phenomenon in the space of gauge fields. — *H. O. Fattorini:* On the angle of dissipativity of ordinary and partial differential operators. — *P. Lelong:* Two equivalent definitions of the density numbers for a plurisubharmonic function in a topological vector space. — *J. Mach:* Chebyshev centers

of compact sets with respect to Stone-Weierstrass subspaces. — *M. C. Matos*: On the Fourier-Borel transformation and spaces of entire functions in a normed space. — *J. McGowan and H. Porta*: On representations of distance functions in the plane. — *R. Mennicken*: Spectral theory for certain operators polynomials. — *M. Nikolas*: Integro-differential operators and theory of summation. — *P. S. Milojevic*: Approximation-solvability of some noncoercive nonlinear equations and semilinear problems at resonance with applications. — *L. A. Moraes*: Holomorphic functions on holomorphic inductive limits and on the strong duals of strict inductive limits. — *V. B. Moscatelli*: Nuclear Köthe quotients of Fréchet spaces. — *J. Mujica*: A completeness criterion for inductive limits of Banach spaces. — *P. Pflug*: About the Caratheodory completeness of all Reinhardt domains. — *J. B. Prolla*: Best simultaneous approximation. — *R. Salvitti*: Abstract Frobenius theorem-global formulation. Applications to Lie groups. — *I. Singer*: Optimization by level set methods II. — *G. S. de Souza*: Spaces formed by special atoms II. — *H. Upmeyer*: A holomorphic characterization of C^* -algebras. — *M. Valdivia*: A property of Fréchet spaces.

George W. SWAN. — **Applications of optimal control theory in biomedicine.** — Pure and applied mathematics: a series of monographs and textbooks, vol. 81. — Un vol. relié, $16 \times 23,5$, de XI, 285 p. — Prix: FS 151.00. — Marcel Dekker, New York/Basel, 1984.

Mathematical theories of optimal control. — Overview of systems concepts. — Optimal control of *Diabetes mellitus*. — Optimal management of thyroid disease. — Optimal administration of drugs. — Optimal control in cancer therapy. — Optimal control problems of the circulatory system. — Miscellaneous applications. Applying a number of engineering optimal control procedures to biomedicine, the author presents insights into the factors that affect patient care and suggests means by which more effective therapies may be developed.

P. McCULLAGH and J. A. NELDER. — **Generalized linear models.** — Monographs on statistics and applied probability. — Un vol. relié, 14×22 , de XIII, 261 p. — Prix: £15.00. — Chapman and Hall, London/New York, 1983.

This book provides a definitive and unified treatment of methods for the analysis of diverse types of data commonly met in the biological, health and social sciences, and also in insurance, food processing, and engineering. The book is concerned primarily with examining the ways in which a response variable depends upon a combination of explanatory variables, treatments and classification variables. Particular emphasis is given to the important case where the dependence is through some unknown linear combination of the explanatory variables. This linear structure makes it possible to extend the familiar notions of interaction, nesting, aliasing and factor structure to models that are not linear in the conventional sense. In addition to ordinary linear regression and analysis of variance models, the class of generalized linear models includes linear logistic and probit models for binary responses, log-linear models for counted data, certain models for survival data and various models for data with constant coefficient of variation.

Jean-Michel BISMUT. — **Large deviations and the Malliavin calculus.** — Progress in mathematics, vol. 45. — Un vol. relié, $15,5 \times 23,5$, de VIII, 216 p. — Prix: FS 49.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

This book is a contribution to the investigation of diffusion processes and stochastic analysis on manifolds. It employs the Malliavin calculus and large deviation techniques to study the asymptotics of the conditional probabilities of bridges associated with certain hypoelliptic diffusions. The program is fully completed in the elliptic case. In the hypoelliptic case, a deterministic Malliavin calculus is developed which exhibits the importance of the corresponding Malliavin covariance matrix in studying the curves of minimal action, and their relations to bicharacteristic curves. Two conjectures are formulated in the hypoelliptic case. A case study is done for the Heisenberg group.

Victor GUILLEMIN, Shlomo STERNBERG. — **Symplectic techniques in physics.** — Un vol. relié, 16 × 23,5, de XI, 468 p. — Prix: £32.50/US\$49.50. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

This book is based on lectures on symplectic geometry given by the authors for several years at the Massachusetts Institute of Technology, Harvard University and the University of Tel Aviv. The authors use the uncluttered, coordinate-free approach to symplectic geometry and classical mechanics that has been developed by mathematicians over the course of the last 30 years, but at the same time apply the apparatus to a great number of concrete problems. In the first chapter, the authors provide an elementary introduction to symplectic geometry and explain the key concepts and results. The remainder of the book is devoted to the detailed analysis and study of the ideas discussed in chapter 1. Some of the themes emphasized in the book include the pivotal role of completely integrable systems, the importance of symmetries, analogies between classical dynamics and optics, the importance of symplectic tools in classical variational theory, symplectic features of classical field theories, and the principle of general covariance.

J. W. BRUCE and P. J. GIBLIN. — **Curves and singularities: a geometrical introduction to singularity theory.** — 15 × 22,5, de XII, 222 p. — Prix: £8.95/US\$15.95. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

The object of this book is to introduce to a new generation of students an area of mathematics which has received a tremendous impetus during the last 20 years or so from developments in singularity theory. The differential geometry of curves and surfaces in Euclidean space has fascinated mathematicians and users of mathematics since the time of Newton. The researches of R. Thom and J. Mather, inspired in part by earlier work of H. Whitney, gave birth in the 1960's to what is now called singularity theory, a term which embraces catastrophes and bifurcations. In this book the authors introduce these new ideas and apply them in contexts such as catastrophe machines, geometric optics, differential equations, envelopes, evolutes, contact, duals of plane and space curves, symmetry sets, profiles of surfaces and generic properties of curves. The key ingredients from singularity theory are unfoldings and the systematic use of transversality.

Carl FAITH and Stanley PAGE. — **FPF ring theory: Faithful modules and generators of mod- R .** — London mathematical society lecture note series, vol. 88. — Un vol. broché, 15 × 23, de ca. 140 p. — Prix: £9.95/US\$19.95. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

Introduction. — The basics. — Noncommutative semiperfect and semiprime $(C)FPF$ rings. — Nonsingular FPF rings. — Goldie prime FPF rings with RRM and the structure of Noetherian prime FPF rings. — Self-injective FPF rings, thin rings and FPF group rings. — Summary of the structure of FPF rings. — Open questions.

Martin TAYLOR. — **Classgroups of group rings.** — London mathematical society lecture note series, vol. 91. — Un vol. broché, 15×23 , de xiii, 119 p. — Prix: £8.95/US\$17.95. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

Fröhlich's description of classgroups. — Character action. — Swan modules. — Reduction theory. — Torsion determinants. — The group logarithm. — Swan modules, classgroups of exceptional groups. — The extension theorem for K_0T . — Adams operations for classgroups.

G. D. JAMES. — **Representations of general linear groups.** — London mathematical society lecture note series, vol. 94. — Un vol. broché, 15×23 , de xii, 147 p. — Prix: £9.95/US\$19.95. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

The most important examples of finite groups are the group of permutations of a set n objects, known as the symmetric group, and the group of non-singular n -by- n matrices over a finite field, which is called the general linear group. This book examines the representation theory of the general linear groups, and reveals that there is a close analogy with that of the symmetric groups. It consists of an essay which was joint winner of the Cambridge University Adams prize 1981-2.

R. C. MASON. — **Diophantine equations over function fields.** — London mathematical society lecture note series, vol. 96. — Un vol. broché, 15×23 , de x, 125 p. — Prix: £7.95/US\$15.95. — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

Diophantine equations over number fields have formed one of the most important and fruitful areas of mathematics throughout civilisation. In recent years increasing interest has been aroused in the analogous area of equations over function fields. However, although considerable progress has been made by previous authors, none has attempted the central problem of providing methods for the actual solution of such equations. The latter is the purpose of this volume: algorithms are provided for the complete resolution of various families of equations, such as those of Thue, hyperelliptic and genus one type. The results are achieved by means of an original fundamental inequality, first announced by the author in 1982. Several specific examples are included as illustrations of the general method and as a testimony to its efficiency.

M. J. BECKMANN, H. P. KUENZI. — **Mathematik für Ökonomen III: Analysis in mehreren Variablen.** — Heidelberger Taschenbücher, Bd. 235. — Un vol. broché, $13,5 \times 20,5$, de x, 226 p. — Prix: DM 24.80. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Funktionen mehrerer Veränderlicher. — Differentialrechnung von Funktionen mehrerer Veränderlicher. — Maxima und Minima. — Differentialgleichungen.

Kinetic theories and the Boltzmann equation. — Lectures given at the 1st 1981 session of the Centro internazionale matematico estivo (CIME), held at Montecatini, Italy, June 10-18, 1981. — Edited by C. Cercignani. — Lecture notes in mathematics, vol. 1048. — Un vol. broché, 16,5 × 24, de vii, 243 p. — Prix: DM 33.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

J. Hejtmánek: Time-dependent linear transport theory. — *H. Neunzert*: An introduction to the nonlinear Boltzmann-Vlasov equation. — *P. F. Zweifel*: The Boltzmann equation and its properties. — *M. D. Arthur*: Preliminary results on the non-existence of solutions for a half space Boltzmann collision model with three degrees of freedom. — *T. Elmroth*: The space-homogeneous Boltzmann equation: a survey of recent results. — *H. Spohn*: Boltzmann hierarchy and Boltzmann equation. — *T. Ytrehus*: A nonlinear half-space problem in the kinetic theory of gases.

Number theory. — A seminar held at the Graduate school and University center of the City university of New York, 1982. — Edited by D. V. Chudnovsky, G. V. Chudnovsky, H. Cohn and M. B. Nathanson. — Lecture notes in mathematics, vol. 1052. — Un vol. broché, 16,5 × 24, de v, 309 p. — Prix: DM 39.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

K. Alladi: Moments of additive functions and sieve methods. — *H. Cohen and H. W. Lenstra, Jr.*: Heuristics on class groups. — *D. V. Chudnovsky and G. V. Chudnovsky*: Padé and rational approximations to systems of functions and their arithmetic applications. Padé approximations to solutions of linear differential equations and applications to Diophantine analysis. — *J. Diamond*: p -adic gamma functions and their applications. — *J. C. Lagarias and A. M. Odlyzko*: New algorithms for computing $\pi(x)$. — *J. Lepowsky and M. Primc*: Standard modules for type one affine Lie algebras. — *C. Moreno*: Some problems of effectivity in arithmetic, geometry and analysis. — *M. B. Nathanson*: The exact order of subsets of additive bases. — *C. F. Osgood*: Effective bounds on the Diophantine approximations of algebraic functions, and Nevanlinna theory. — *P. Sarnak*: Additive number theory and Maass forms.

Vidar THOMÉE. — **Galerkin finite element methods for parabolic problems.** — Lecture notes in mathematics, vol. 1054. — Un vol. broché, 16,5 × 24, de vii, 237 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

The standard Galerkin method. — Semidiscrete methods based on more general approximations of the elliptic problem. — Smooth and non-smooth data error estimates for the homogeneous equation. — Parabolic equations with more general elliptic operators. — Maximum-norm estimates. — Negative norm estimates and superconvergence. — Completely discrete schemes for the homogeneous equation and for the inhomogeneous equation. — Time discretization by the discontinuous Galerkin method. — A nonlinear problem. — The method of lumped masses. — The H^1 and H^{-1} methods. — A mixed method. — A singular problem.

Quantum probability and applications to the quantum theory of irreversible processes. — Proceedings of the International workshop held at Villa Mondragone, Italy, September 6-11, 1982. — Edited by L. Accardi, A. Frigerio and V. Gorini. —

Lecture notes in mathematics, vol. 1055. — Un vol. broché, 16,5 × 24, de vi, 411 p. — Prix: DM 49.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

The recognition that a new non-classical probabilistic formalism arises in quantum theory dates back to the early days of quantum mechanics. In recent years there has been an intensive development of this new probabilistic model motivated by problems arising both in pure mathematics and in physics. The main goal of this workshop was to provide an exhaustive picture of the present status of research as well as a reference point for people wishing to do research in this area. The main topics treated include: non-Kolmogorovian probabilistic differential equations and the quantum Langevin equation, quantum Markov processes and their applications in the description of open systems, quantum measurement theory, quantum ergodic, martingale and central limit theorems, and stochastic quantization.

Algebraic geometry, Bucharest 1982. — Proceedings of the International conference held in Bucharest, Romania, August 2-7, 1982. — Edited by L. Badescu and D. Popescu. — Lecture notes in mathematics, vol. 1056. — Un vol. broché, 16,5 × 24, de vii, 380 p. — Prix: DM 44.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

The topics reflect the current research activity of the contributing authors and include the theory of classification and enumeration of special varieties, singularities, projective embeddings of surfaces, topological conditions for finite generatedness of subalgebras, of C -algebras of the finite type, vector bundles on special varieties, and pathological properties of surfaces in characteristic p .

Bifurcation theory and applications. — Lectures given at the 2nd 1983 Session of the Centro internazionale matematico estivo (CIME) held at Montecatini, Italy, June 24-July 2, 1983. — Edited by L. Salvadori. — Lecture notes in mathematics, vol. 1057. — Un vol. broché, 16,5 × 24, de vii, 223 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

S. Busenberg: Bifurcation phenomena in biomathematics. — *J. J. Duistermaat*: Bifurcations of periodic solutions near equilibrium points of Hamiltonian systems. — *J. K. Hale*: Introduction to dynamic bifurcation. — *G. Iooss*: Bifurcation and transition to turbulence in hydrodynamics. — *W. S. Loud*: Some examples of bifurcation. — *A. Vanderbauwhede*: Stability of bifurcation equilibria and the principle of reduced stability.

Bernd AULBACH. — **Continuous and discrete dynamics near manifolds of equilibria.** — Lecture notes in mathematics, vol. 1058. — Un vol. broché, 16,5 × 24, de ix, 142 p. — Prix: DM 24.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Differential equations: Basic results. Asymptotic phase. Saddle point property. Equations with a nonstationary integral manifold. The basic selection model from population genetics for overlapping generations. — *Difference equations*: Basic results. Asymptotic phase. Saddle point property. Equations with a nonstationary invariant manifold. The basic selection model from population genetics for separated generations. — *Appendices*: Reducibility. Linear equations. An algebraic equation arising in population genetics.

Elie CARTAN. — **Oeuvres complètes.** — 4 vol. reliés, 15,7 × 24, environ 4680 p. — Prix: FF 900.00. — Editions du Centre national de la recherche scientifique, Paris, 1984.

Les œuvres complètes d'Elie Cartan ont été éditées en 1952 en trois parties de deux volumes chacune. Cette nouvelle édition est composée de trois parties en quatre volumes. A chaque partie correspond un thème scientifique. La partie I est consacrée aux groupes de Lie, la partie II à l'algèbre, aux systèmes différentiels et aux problèmes d'équivalence, la partie III à la géométrie (riemannienne et projective) ainsi qu'aux études relatives à la mécanique (sur l'usage des invariants intégraux). Cette nouvelle édition couvre l'ensemble des articles de recherche d'Elie Cartan à l'exception de ses monographies et de sa correspondance. Elle contient aussi une notice sur ses travaux, écrite par Elie Cartan à l'occasion de sa candidature à l'Académie des sciences, ainsi que les notices nécrologiques écrites par S. S. Chern et C. Chevalley pour l'American mathematical society et par J. H. C. Witehead pour la Royal society. — Du fait de sa profondeur, de sa variété et de sa grande originalité, l'œuvre d'Elie Cartan apparaît de plus en plus comme un tournant fondamental dans l'évolution de la géométrie, tournant dont toutes les conséquences n'ont pas encore été explorées. Beaucoup de géomètres contemporains trouvent dans la lecture des œuvres d'Elie Cartan une source d'inspiration.

Numerical methods for bifurcation problems. — Proceedings of the conference at the University of Dortmund, August 22-26, 1983. — Edited by T. Küpper, H. D. Mittelmann, H. Weber. — International series of numerical mathematics, vol. 70. — Un vol. relié, 17 × 24, de 584 p. — Prix: FS 88.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

In past years considerable progress has been made in analyzing and applying numerical methods for bifurcation problems. This volume tries to give a systematic and comprehensive account of the recent developments in this area by presenting several survey articles. These include a survey of applications of bifurcation theory to the engineering sciences. Some of the topics treated are: continuation methods, direct methods for the computation of singular points, applications of singularity theory, multi-grid methods for bifurcation problems, Hopf bifurcation and various problems from the natural and engineering sciences.

Several complex variables. — Proceedings of the 1981 Hangzhou conference. — Edited by J. J. Kohn, Q.-k. Lu, R. Remmert, Y.-T. Siu. — Un vol. relié, 15,5 × 23,5, de XIII, 267 p. — Prix: FS 60.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

These papers, originally presented at the first international conference in several complex variables held in China, cover complex differential geometry, integral representation, boundary behavior of holomorphic functions, invariant metrics, holomorphic vector bundles, and pseudoconvexity. This is a field where fruitful interplays among methods of algebraic geometry, differential geometry, and partial differential equations are leading to new directions of research.

Emil GROSSWALD. — **Topics from the theory of numbers.** — 2nd edition. — Un vol. relié, 16 × 24, de XIII, 333 p. — Prix: FS 64.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

Many of the important and creative developments in modern mathematics resulted from attempts to solve questions that originate in number theory. The publication

of this newly revised and expanded edition of Emil Grosswald's classic text presents an illuminating introduction to number theory. Combining the historical developments with the analytical approach, this book offers the reader a diverse range of subjects to investigate, including: divisibility, congruences, the Riemann zeta function, Diophantine equations and Fermat's conjecture, the theory of partitions. Comprehensive in nature, "Topics from the theory of numbers" will prove to be an ideal text for advanced undergraduates and graduate students alike.

Automorphic forms of several variables. — Taniguchi symposium, Katata, 1983. — Edited by Ichiro Satake and Yasuo Morita. — Progress in mathematics, vol. 46. — Un vol. relié, 15,5 × 23,5, de ix, 383 p. — Prix: FS 74.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

This Taniguchi symposium focused on the geometric aspect of the theory of automorphic forms of several variables. These papers cover such topics as Eisenstein series, Hilbert and Siegel modular varieties, dimension formulae for the space of automorphic forms, and families of abelian varieties. Other papers present more number-theoretic viewpoints: arithmetic automorphic forms, Shimura varieties, and p -adic group representations, reflecting recent developments in this field.

John TATE. — **Les conjectures de Stark sur les fonctions L d'Artin en $s = 0$.** — Notes d'un cours à Orsay rédigées par Dominique Bernardi et Norbert Schappacher. — Progress in mathematics, vol. 47. — Un vol. relié, 15,5 × 23,5, de 143 p. — Prix: FS 38.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

This book presents a self-contained introduction to H. M. Stark's remarkable conjectures about the leading term of the Taylor expansion of Artin's L -functions at $s = 0$. These conjectures can be viewed as a vast generalization of Dirichlet's class number formula and Kronecker's limit formula. They provide an unexpected contribution to Hilbert's 12th problem on the generalization of class fields by the values of transcendental functions. This volume treats these topics: a proof of the main conjecture for rational characters, and Chinburg's invariant; P. Deligne's proof of a function field analogue; p -adic versions of the conjectures due to B. Gross and J.—P. Serre.

Albrecht FRÖHLICH. — **Classgroups and Hermitian modules.** — Progress in mathematics, vol. 48. — Un vol. relié, 15,5 × 23,5, de xvii, 226 p. — Prix: FS 54.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

The primary motivation for this work comes from the connection with the Galois module structure of rings of algebraic integers. This book contains a systematic and comprehensive account of the Galois homomorphism approach to various classgroups attached to orders, and in particular to group rings, which has been fundamental in much recent work. The forms studied are more general than those usually considered by topologists and K -theorists. The main application, which motivated the theory is to the Hermitian Galois module of algebraic integers, defined in terms of the trace.

Henrik SCHLICHTKRULL. — **Hyperfunctions and harmonic analysis on symmetric spaces.** — Progress in mathematics, vol. 49. — Un vol. relié, 15,5 × 23,5, de xiv, 185 p. — Prix: FS 48.00. — Birkhäuser, Boston/Basel/Stuttgart, 1984.

This book gives an introductory exposition of the theory of hyperfunctions and regular singularities, and on this basis it treats two major applications to harmonic analysis. The first is to the proof of Helgason's conjecture, due to Kashiwara et al., which represents eigenfunctions on Riemannian symmetric spaces as Poisson integrals of their hyperfunction boundary values. A generalization of this result involving the full boundary of the space is also given. The second topic is the construction of discrete series for semisimple symmetric spaces, with an unpublished proof, due to Oshima, of a conjecture of Flensted-Jensen.

W. BARTH, C. PERS, A. VAN DE VEN. — **Compact complex surfaces.** — *Ergebnisse der Mathematik und ihrer Grenzgebiete. 3. Folge, Bd. 4.* — Un vol. relié, 17 × 25, de x, 304 p. — Prix: DM 118.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This book provides a systematic descriptions of traditional classification theory as well as many new results presented in a systematic way. The point of view is analytic, distinguishing the book from practically all other treatments of classification theory which concentrate primarily on algebraic surfaces. — *Contents:* Curves on surfaces. — Mappings of surfaces. — Some general properties of surfaces. — Examples. — The Enriques-Kodaira classification. — Surfaces of general type. — $K3$ -surfaces and Enriques surfaces.

Jean-Pierre AUBIN, Arrigo CELLINA. — **Differential inclusions: set-valued maps and viability theory.** — *Grundlehren der mathematischen Wissenschaften, vol. 264.* — Un vol. relié, 16 × 24, de XIII, 342 p. — Prix: DM 118.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Background notes. — Set-valued maps. — Existence of solutions to differential inclusions. — Differential inclusions with maximal monotone maps. — Viability theory: the nonconvex case. — Viability theory and regulation of controlled systems: the convex case. — Liapunov functions.

Harold M. EDWARDS. — **Galois theory.** — *Graduate texts in mathematics, vol. 101.* — Un vol. relié, 16 × 24, de XIII, 152 p. — Prix: DM 68.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This is a constructive and concrete introduction to Galois theory presenting an exposition of the theory in terms near enough to Galois' own to make his main memoir accessible to the reader. Antecedents of the theory in the works of Newton, Lagrange and Gauss are used to set the stage for the introduction of Galois' ideas. Galois' own memoir is included (in translation) as appendix to the book. In addition to the historical material, the book contains an explanation of the modern formulation of Galois theory along with a large number of challenging exercises with complete answers.

Y. MOTOHASHI. — **Lectures on sieve methods and prime number theory.** — *Tata institute of fundamental research lectures on mathematics and physics, vol. 72.* — Un vol. broché, 18,5 × 24, de XIV, 205 p. — Prix: DM 20.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1983.

The 1st part of this book concentrates on sieve methods, and deals especially with Selberg's fundamental sieve idea in its hybridized version with Linnik's large

sieve, and with elements of the combinatorial sieve and the linear sieve. In the 2nd part, the author turns to applications of results from the 1st part in some basic problems in the theory of the distribution of prime numbers. The main topics considered are zero-free regions for the Riemann zeta function and Dirichlet L -series, zero-density estimates and the existence of primes in short intervals and in short arithmetic progressions.

Francis CAILLIEZ. — **Analyse des données.** — Séminaire de mathématiques supérieures, vol. 87. — Un vol. broché, $21,5 \times 28$, de 103 p. — Prix: C\$12.00. — Les Presses de l'Université de Montréal, Montréal, 1984.

Rappels d'algèbre linéaire. — Schéma de dualité, géométrie dans R^n . — Analyse en composantes principales. — Analyse canonique. — Analyse factorielle discriminante. — Analyse factorielle des correspondances.

Badaoui EL MABSOUT. — **Calcul différentiel: exercices.** — Collection « Maîtrise de mathématiques pures ». — Un vol. broché, 16×24 , de 168 p. — Prix: FF 75.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1984.

Ce livre d'exercices se base sur le livre de cours « Calcul différentiel » de A. Avez paru dans la même collection. Pour des raisons pédagogiques, l'ouvrage se divise en 3 parties: énoncés, indications, solutions. La 2^e partie contient des suggestions concernant les démarches à suivre pour résoudre les exercices. Ces derniers suivent la division en chapitres du livre de cours: notion de différentielle, théorèmes de la moyenne, notions de difféomorphismes — résolution d'équations différentielles d'ordre supérieur, fonctions exponentielles — équations différentielles linéaires à coefficients constants, produit intégral — équations différentielles linéaires, champs de vecteurs — équations différentielles, conjugaisons et coordonnées locales, sous-variétés différentiables, calcul des variations.

David SALSBERG. — **Understanding randomness: exercises for statisticians.** — Lecture notes in statistics, vol. 6. — Un vol. broché, $18 \times 25,5$, de vii, 105 p. — Prix: FS 48.00. — Marcel Dekker, New York/Basel, 1983.

Statistical analysis requires skill in deciding what components of the data reflect an underlying structure or model, and what components are random noise around that model. This concise, easy-to-follow book provides examples of simple well-defined structures and associated random noise, along with exercises designed to develop proficiency in that skill. — *Contents*: Uniform distributions. — Single samples of continuously distributed random variables with positive skew. — Paired data. — Contingency tables. — Models versus data. — Real life data.

Siegfried BOSCH, Ulrich GUNTZER, Reinhold REMMERT. — **Non-Archimedean analysis: a systematic approach to rigid analytic geometry.** — Grundlehren der mathematischen Wissenschaften, vol. 261. — Un vol. relié, $16 \times 23,5$, de xii, 436 p. — Prix: DM 168.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

LINEAR ULTRAMETRIC ANALYSIS AND VALUATION THEORY: *Norms and valuations: Semi-normed and normed groups and rings. — Power-multiplicative semi-norms. — Strictly convergent power series. — Non-Archimedean valuations. — Discrete valuation rings. — Bald and discrete B -rings. — Quasi-Noetherian B -rings. — Normed*

modules and normed vector spaces: Normed and faithfully normed modules. — *Examples of normed and faithfully normed A -modules*. — Weakly cartesian spaces. — Cartesian spaces. — Strictly cartesian spaces. — Weakly cartesian spaces of countable dimension. — Normed vector spaces of countable type. The lifting theorem. — Banach spaces. — *Extensions of norms and valuations*: Normed and faithfully normed algebras. — Algebraic field extensions. Spectral norm and valuations. — Classical valuation theory. — Properties of the spectral valuation. — Weakly stable fields. — Stable fields. — Banach algebras. — Function algebras. — Tame modules and Japanese rings (Appendix). — AFFINOID ALGEBRAS: *Strictly convergent power series*: Definition and elementary properties of T_n and \bar{T}_n . — Weierstrass-Rückert theory for T_n . — Stability of $Q(T_n)$. — *Affinoid algebras and finiteness theorems*: Elementary properties of affinoid algebras. — The spectrum of a k -affinoid algebra and the supremum semi-norm. — The reduction functor $A \rightarrow \tilde{A}$. — The functor $A \rightarrow \dot{A}$. — RIGID ANALYTIC GEOMETRY: *Local theory of affinoid varieties*: Affinoid varieties and subdomains. — Immersions of affinoid varieties. — Čech cohomology of *affinoid varieties*: Čech cohomology with values in a presheaf. — Tate's acyclicity theorem. — *Rigid analytic varieties*: Grothendieck topologies. — Sheaf theory. — Analytic varieties. Definitions and constructions. — Coherent modules. — Closed analytic subvarieties. — Separated and proper morphisms. — An application to elliptic curves.

David A. RATKOWSKY. — **Nonlinear regression modeling: a unified practical approach**. — Statistics: textbooks and monographs, vol. 48. — Un vol. relié, 16 × 23,5, de VIII, 276 p. — Prix: FS 108.00. — Marcel Dekker, New York/Basel, 1983.

“Nonlinear regression modeling” is the only available work in this field focusing on statistical properties of the parameter estimates. The volume inspires the search for models that behave almost linearly, and considers nonlinearity in such models as yield-density, sigmoidal growth, and asymptotic regression. *Contents*: Introduction to regression models. — Assessing nonlinearity in nonlinear regression models. — Yield-density models. — Sigmoidal growth models. — Asymptotic regression models. — Some miscellaneous models. — Comparing parameter estimates from more than one data set. — Obtaining good initial parameter estimates. — *Summary*: toward a unified approach to nonlinear regression modeling.

Robustness of Bayesian analyses. — Edited by Joseph B. Kadane. — Studies in Bayesian econometrics, vol. 4. — Un vol. relié, 17 × 24,5, de XII, 310 p. — Prix: Dfl 150.00. — North-Holland, Amsterdam/New York/Oxford, 1984.

Ward Edwards, Harold Lindman, Leonard J. Savage: Bayesian statistical inference for psychological research. — *James O. Berger*: The robust Bayesian viewpoint. — Comments on “The robust Bayesian viewpoint” by James Berger. — *Joseph B. Kadane and David T. Chuang*: Stable decision problems. — *David T. Chuang*: Further theory of stable decisions. — *Wolfgang Polasek*: Multivariate regression systems — estimation and sensitivity analysis of two-dimensional data. — *From the preface*: The first paper by Edwards, Lindman and Savage, is a classic in this area. The paper of Berger, with comments by Brown, Hill, Kadane and Lindsey, represents a Bayesian view that draws on some non-Bayesian elements. The brief paper of Kadane and Chuang introduces the Chuang dissertation, which treats robustness as a kind of limiting sensitivity analysis. Finally, the paper of Polasek shows an econometrically-oriented view of Bayesian robustness, with applications.

Clifford E. LUNNEBORG, Robert D. ABBOTT. — **Elementary multivariate analysis for the behavioral sciences: applications of basic structure.** — Un vol. relié, 16 × 23,5, de xvi, 522 p. — Prix: Dfl 120.00. — North-Holland, New York/Amsterdam/Oxford, 1983.

Basic tools of multivariate data analysis: The data matrix. Working with matrices. The information in a matrix. The basic structure of a matrix. Transforming data matrices. Optimizing transformations. — *Basic structure and the univariate criterion:* Least squares: data fitting. Linear regression: some theory and applications. — *Basic structure and the multivariate criterion:* Basic structure and multivariate normal samples. The multivariate general linear model: some principles and applications. — *Multivariate approaches and other applications:* An analysis model for categorical data. Basic structure and the analysis of interdependence. Latent variable structural equation models.

M. S. SRIVASTAVA, E. M. CARTER. — **An introduction to applied multivariate statistics.** — Un vol. relié, 16 × 23,5, de x, 394 p. — Prix: Dfl 115.00. — North-Holland, New York/Amsterdam/Oxford, 1983.

Some results on matrices. — Multivariate normal distributions. — Inference on location, Hotelling's T^2 . — Multivariate analysis of variance. — Multivariate regression. — Analysis of growth curves. — Repeated measures and profile analysis. — Classification and discrimination. — Correlation. — Principal component analysis. — Factor analysis. — Inference on covariance matrices.

P. G. CIARLET. — **Lectures on three-dimensional elasticity.** — Lectures delivered at the Indian institute of science, Bangalore. — Tata Institute of fundamental research lectures on mathematics, vol. 71. — Un vol. broché, 18 × 24, de v, 149 p. — Prix: DM 20.00. — Narosa publishing house, New Delhi, 1983.

Description of three-dimensional elasticity: Geometrical preliminaries. — Equilibrium equations. — Constitutive equations. — Hyperelasticity. — *Some mathematical aspects of three-dimensional elasticity:* General considerations about the boundary value. — Problems of three-dimensional elasticity. — The linearized system of elasticity. — Existence theorems via the implicit function theorem. — Convergence of semi-discrete incremental methods. — An existence theorem for minimizing functionals and outline of its application to non-linear elasticity. — J. Ball's polyconvexity and existence theorems in three-dimensional elasticity. — Bibliography, comments and some open problems.

Kiyoshi OKA. — **Collected papers.** — Translated from the French by R. Narasimhan, with commentaries by H. Cartan. — Edited by R. Remmert. — Un vol. relié, 17 × 25, de xiv, 223 p. — Prix: DM 98.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Rationally convex domains. — Domains of holomorphy. — The second Cousin problem. — Domains of holomorphy and rationally convex domains. — The Cauchy integral. — Pseudoconvex domains. — On some arithmetical notions. — Fundamental lemma. — Unramified domains without points at infinity. — A new method of generating pseudoconvex domains. — Note on families of multivalued analytic functions. — On pseudoconvex domains.

H. M. SRIVASTAVA and H. L. MANOCHA. — **A treatise on generating functions.** — Ellis Horwood series in mathematics and its applications. — Un vol. relié, 15,5 × 23,5, de 569 p. — Prix: £37.50. — Ellis Horwood limited, Chichester, distributed by John Wiley and sons, New York/Chichester/Brisbane/Toronto, 1984.

This carefully written graduate level book is the first to present a systematic introduction to the subject. The authors give several interesting and useful applications of, and treat in meticulous detail, the various methods of obtaining linear, bilinear, bilateral or mixed multilateral generating functions for polynomials in one, two or more variables. They incorporate recent work which is important in a wide variety of fields. The authors develop a wide range of methods shown to apply to the Bessel polynomials, the classical orthogonal polynomials, including those of Hermite, Jacobi, Gegenbauer, Legendre, Tchebycheff and Laguerre, and to their various generalisations as well as to many other special functions, e.g. Meixner and Cesaro polynomials, the generalised Sylvester polynomials, the Lauricella polynomials in several variables. This book is made self-contained by including the necessary background material in the theory of special functions. Each chapter concludes with a set of problems, based on the material presented in that chapter. The extensive and up-to-date bibliography contains references also to other methods of obtaining generating functions which are not dealt with at length in the book.

Keith J. DEVLIN. — **Constructibility.** — Perspectives in mathematical logic. — Un vol. relié, 17 × 25, de xi, 425 p. — Prix: DM 158.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This book is intended to give a fairly comprehensive account of the theory of constructible sets at an advanced level. The intended reader is a graduate mathematician with some knowledge of mathematical logic. The book is not intended to provide a complete coverage of the many and diverse applications of the methods of constructibility theory, rather the theory itself. Such applications as are given are there to motivate and to exemplify the theory. The book is divided into two parts. Part A ("Elementary theory") deals with the classical definition of the L_α -hierarchy of constructible sets. With some pruning, this part could be used as the basis of a graduate course on constructibility theory. Part B ("Advanced theory") deals with the J_α -hierarchy and the Jensen "fine-structure theory".

Christian BERG, Jens Peter Reus CHRISTENSEN, Paul RESSEL. — **Harmonic analysis on semigroups: theory of positive definite and related functions.** — Graduate texts in mathematics, vol. 100. — Un vol. relié, 16 × 24, de x, 289 p. — Prix: DM 118.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

Positive definite functions on abelian semigroups are a common generalization of Laplace and Fourier transforms, generating functions, moment sequences, and related concepts. This book provides a self contained treatment of those and related classes of functions. The theory has many applications in other areas of mathematics, particularly in probability theory and statistics. *Contents*: Introduction to locally convex topological vector spaces and duals pairs. — Radon measures and integral representations. — General results on positive and negative definite matrices and kernels. — Main results on positive and negative definite functions on semigroups. — Schoenberg type results for positive and negative definite functions. — Positive definite functions and moment functions. — Hoeffding's inequality and multivariate majorization. — Positive and negative definite functions on Abelian semigroups without zero.

V. S. VARADARAJAN. — **Lie groups, Lie algebras, and their representations.** — Graduate texts in mathematics, vol. 102. — Un vol. relié, 16 × 24, de XIII, 430 p. — Prix: DM 88.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This is a basically unchanged reprint of a very well respected introduction to Lie groups, Lie algebras and their representations. A special feature of the book is the integrated treatment of the global and infinitesimal aspects of Lie groups and their representations, a fact which, together with the general clarity of the exposition, has made the book popular not only among specialists but also among users of Lie theory, particularly physicists.

D. H. LUECKING, L. A. RUBEL. — **Complex analysis: a functional analysis approach.** — Universitext. — Un vol. broché, 15,5 × 23,5, de VII, 176 p. — Prix: DM 45.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This book is addressed to mathematicians and graduate students of mathematics with at least one semester of "conventional" complex variables. The authors present the theory of complex variables in a unified new approach based on the identification of the dual of the space of analytic functions on a region as a space of germs of holomorphic functions on the complement. Once this has been shown, many of the standard results follow easily, and the reader obtains an efficient and stimulating introduction to complex analysis in a spirit that is very close to Cauchy's original ideas.

Hans GRAUERT, Reinhold REMMERT. — **Coherent analytic sheaves.** — Grundlehren der mathematischen Wissenschaften, vol. 265. — Un vol. relié, 16 × 23,5, de XVIII, 249 p. — Prix: DM 118.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Complex spaces. — Local Weierstrass theory. — Finite holomorphic maps. — Analytic sets. Coherence of ideal sheaves. — Dimension theory. — Analyticity of the singular locus. Normalization of the structure sheaf. — Riemann extension theorem and analytic coverings. — Normalization of complex spaces. — Irreducibility and connectivity. Extension of analytic sets. — Direct image theorem. — *Annex*: Theory of sheaves. Notion of coherence.

Reinhold REMMERT. — **Funktionentheorie I.** — Grundwissen Mathematik, Bd. 5. — Un vol. broché, 16,5 × 24, de XIII, 324 p. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Dieses Buch wird viele Studierende auf ihrem Weg in dieses klassische Gebiet der Mathematik begleiten, das bis heute wohl das fruchtbarste Beispiel des innigen Zusammenhangs zwischen Analysis und Algebra darstellt. Bei Prüfungsvorbereitungen hat man schnell die wesentlichen Resultate zur Verfügung und erhält eine Fülle von interessanten Anregungen. Auch der Lehrer und der Mathematiker in der Wirtschaft und Industrie wird dieses Buch mit grossem Gewinn lesen und immer wieder gerne hierauf zurückgreifen. — *Inhaltsübersicht*: Historische Einführung. — Zeittafel. — Elemente der Funktionentheorie. — Cauchysche Funktionentheorie. — Cauchy-Weierstrass-Riemannsche Funktionentheorie. — Kurzbiographen von Abel, Cauchy, Eisenstein, Euler, Riemann und Weierstrass. — Literatur.

George W. BLUMAN. — **Problem book for first year calculus.** — Problem books in mathematics. — Un vol. relié, 16,5 × 24, de xv, 385 p. — Prix: DM 124.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

Graphing. — Geometry. — Physics and engineering. — Business and economics. — Biology and chemistry. — Numerical methods. — Theory. — Techniques. — Answers to supplementary problems. — The chapters are arranged according to areas of applications, preceded by two chapters with problems emphasizing the importance of graphs and geometry in applications. Most of the chapters contain brief introductions to the background material necessary for doing the corresponding problems. The problems themselves range from routine questions to challenging exercises; about a third of each chapter's problems are worked out in detail.

Charles W. CURTIS. — **Linear algebra: an introductory approach.** 4th ed. — Undergraduate texts in mathematics. — Un vol. relié, 16 × 24, de x, 337 p. — Prix: DM 72.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

Introduction to linear algebra. — Vector spaces and systems of linear equations. — Linear transformations and matrices. — Vector spaces with an inner product. — Determinants. — Polynomials and complex numbers. — The theory of a single linear transformation. — Dual vector spaces and multilinear algebra. — Orthogonal and unitary transformations. — Some applications of linear algebra. — Bibliography and solutions of selected exercises.

G. Baley PRICE. — **Multivariable analysis.** — Un vol. relié, 16,5 × 24, de xiv, 655 p. — Prix: DM 118.00. — Springer-Verlag, New York/Berlin/Heidelberg/Tokyo, 1984.

This book is an innovative, geometrically oriented introduction to the theory of functions, real and complex. The book combines full generality with careful step-by-step explanations, augmented by numerous illustrations, examples, and exercises. — *Contents:* Differentiable functions and their derivatives. — Uniform differentiability and approximations, mappings. — Simplexes, orientations, boundaries, and simplicial subdivisions. — Sperner's lemma and the intermediate-value theorem. — The inverse-function theorem. — Integrals and the fundamental theorem of the integral calculus. — Zero integrals, equal integrals, and the transformation of integrals. — The evaluation of integrals. — The Kronecker integral and the Sperner degree. — Differentiable functions of complex variables. — Determinants. — Real numbers, Euclidean spaces, and functions.

Séminaire de probabilités XVIII, 1982/83: proceedings. — Edité par J. Azéma et M. Yor. — Lecture notes in mathematics, vol. 1059. — Un vol. broché, 16,5 × 24, de iv, 518 p. — Prix: DM 62.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This 18th of the now Paris-based Séminaires de probabilités consists of original research papers in diverse areas of the theory of stochastic processes such as Brownian motion, local times, semimartingales and stochastic integration, probabilistic study of Riesz transforms, stochastic mechanics, and multiparameter processes. — *From the contents:* R. F. Bass: Markov processes and convex minorants. — L. C. G. Rogers: Brownian local times and branching processes. — F. B. Knight: On the Ray topo-

logy. — *R. F. Gundy*: Temps locaux et intégrale d'aire de Lusin. — *P. A. Meyer*: Transformations de Riesz pour les lois gaussiennes.

Topology: general and algebraic topology, and applications. — Proceedings of the International topological conference, held in Leningrad, August 23-27, 1982. — Edited by L. D. Faddeev and A. A. Mal'cev. — Lecture notes in mathematics, 1060. — Un vol. broché, $16,5 \times 24$, de vi, 389 p. — Prix: DM 44.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Current trends in the field are reflected in this Leningrad international topology conference volume: general topology, algebraic topology, topology of manifolds and some related subjects such as differential geometry, dynamical systems and real algebraic geometry. All the most active topics are covered, from very abstract parts of set-theoretic topology to applications to problems of physical origin.

Séminaire de théorie du potentiel, Paris, No. 7. — Directeurs: M. Brelot, G. Choquet et J. Deny. — Rédacteurs: F. Hirsch et G. Mokobodzki. — Lecture notes in mathematics, vol. 1061. — Un vol. broché, $16,5 \times 24$, de iv, 281 p. — Prix: DM 33.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

D. Arques: Représentation des opérateurs vérifiant le principe du maximum positif. — *H. Ben Saad*: Généralisation des noyaux V_h et applications. Fonction de Green sur un espace de Brelot. — *N. Bouleau*: Quelques résultats probabilistes sur la subordination au sens de Bochner. Opérateur carré du champ, subordinateurs et processus de Dirichlet. — *R. M. Dubois*: Systèmes paraboliques et dissipativité pour différentes normes. — *D. Feyel*: Potentiels adjoints et potentiels directs. Remarques sur les cônes de potentiels. — *F. Hirsch*: Générateurs étendus et subordination au sens de Bochner. — *M. Ito*: Sur une décomposition des noyaux de convolution de Hunt. L'unicité de la décomposition des noyaux de convolution de Hunt. Sur le problème de Choquet concernant la TV -inégalité. L'existence des noyaux de convolution N sur R^+ vérifiant $N \in (TV)$ et $N \notin B$. — *G. Lumer*: Equations de diffusion générales sur des réseaux infinis. — *M. J. Raynaud-Pimienta*: Lien entre: différentiabilité en norme, la différentiabilité fine, les capacités Newtonniennes. — *E. Smyrnelis*: Axiome de domination dans les espaces biharmoniques.

Jürgen JOST. — **Harmonic maps between surfaces.** — Lecture notes in mathematics, vol. 1062. — With a special chapter on conformal mappings. — Un vol. broché, $16,5 \times 24$, de x, 133 p. — Prix: DM 19.80. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This book contains a fairly complete and self-contained treatment of harmonic maps between surfaces, giving existence, uniqueness and regularity results together with several applications ranging from complex analysis to algebraic topology. Conformal mappings are used consistently throughout the book. The book illustrates the variety of methods and the interplay of different fields within the subject, in particular the calculus of variations, partial differential equations, differential geometry, algebraic topology and complex analysis.

Orienting polymers. — Proceedings of a workshop held at the IMA, University of Minnesota, Minneapolis, March 21-26, 1983. — Edited by J. L. Ericksen. — Lecture

notes in mathematics, vol. 1063. — Un vol. broché, 16,5 × 24, de vii, 166 p. — Prix: DM 24.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

Among those concerned with the macroscopic behavior of high polymers, a common notion is that these materials may not be oriented or may be oriented in different ways, and that the nature of this orientation can be changed, sometimes dramatically, by various factors. The Institute for Mathematics and its Applications sponsored this workshop to seek better understanding of such phenomena. It focused on relevant observations and some promising attempts to construct appropriate mathematical models.

Probability measures on groups VII. — Proceedings of a conference held in Oberwolfach, 24-30 April 1983. — Edited by H. Heyer. — Lecture notes in mathematics, vol. 1064. — Un vol. broché, 16,5 × 24, de x, 588 p. — Prix: DM 76.00. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

The 31 research and survey papers included in the present volume reflect progress in various directions of research (within the theory of probability) on algebraic-topological-geometrical structures such as groups, semigroups, hypergroups, Sturm-Liouville systems, Gelfand pairs, and general homogeneous spaces. The papers are grouped under the following headings: probability measures on locally compact groups (decomposition, infinite divisibility, canonical representation, holomorphy, stability), random walks on groups and homogeneous spaces, Markov processes on hypergroups, noncommutative probability theory, and random matrices and operators.

Annie CUYT. — **Padé approximants for operators: theory and applications.** — Lecture notes in mathematics, vol. 1065. — Un vol. broché, 16,5 × 24, de ix, 138 p. — Prix: DM 19.80. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

This research monograph centres on a generalization for nonlinear operators of the concept of Padé approximants; although the univariate Padé approximant becomes a special case of the theory, many of its properties extend to the general case. — *Contents:* Abstract Padé-approximants in operator theory. — Multivariate Padé-approximants. — The solution of nonlinear operator equations.

Numerical analysis. — Proceedings of the 10th Biennial conference held at Dundee, Scotland, June 28-July 1, 1983. — Edited by David F. Griffiths. — Lecture notes in mathematics, vol. 1066. — Un vol. broché, 16,5 × 24, de xi, 275 p. — Prix: DM 33.50. — Springer-Verlag, Berlin/Heidelberg/New York/Tokyo, 1984.

The objective of this conference, as in the more recent conferences in the series, was to promulgate recent research results from as wide an area as possible under the general heading of numerical analysis. The topics covered in these proceedings range from the use of splines in interactive computer graphics and high precision floating point arithmetic through approximation theory and optimization to the study of integral equations and differential equations. The treatment of differential equations is the dominant theme and coverage includes discussion of stiffness, singular perturbations, bifurcation, singularities and miscible displacements.

Multivariate statistical methods in physical anthropology: a review of recent advances and current developments. — Edited by G. N. Van Vark and W. W. Howells. — Un

vol. relié, 16,5 × 24,5, de x, 433 p. — Prix: Dfl 160.00. — D. Reidel publishing company, Dordrecht/Boston/Lancaster, 1984.

This volume constitutes an updated and revised selection from among the papers presented at a symposium which was held in Amsterdam on April 23-25, 1981. The purpose of the scientific editors of this symposium has been to bring mathematical statisticians and anthropologists together, for personal discussions across disciplinary lines as well as within disciplines. The papers are devoted both to new methodology and to its practical application. — *Contents: W. W. Howells: Introduction. — R. S. Corruccini: Interpretation of metrical variables in multivariable analysis. — J. C. Gower and P. G. N. Digby: Some recent advances in multivariate analysis applied to anthropometry. — W. H. V. de Goede: Incomplete samples from multivariate normal distributions with the same, known covariance matrix. — C. Radhakrishna Rao: Use of diversity and distance measures in the analysis of qualitative data. — M. Finnegan and R. M. Rubison: Multivariate distances and multivariate classification systems using non-metric traits in biological studies. — C. Susanne: Generalized distance in familial studies of anthropometrical characters. — E. Defrise-Gussenhoven and R. Orban-Segebarth: Generalized distance between different thigh-bones and a reference population. — J. Hiernaux: The use of multivariate distances for non-classificatory purposes in anthropobiology. — A. W. Ambergen, W. Schaafsma: Interval estimates for posterior probabilities, applications to border cave. — F. W. Wilmlink and H. T. Uytterschaut: Cluster analysis, history, theory and applications. — N. A. Campbell: Some aspects of allocation and discrimination. — C. E. Oxnard: Interpretation and testing in multivariate statistical approaches to physical anthropology: the example of sexual dimorphism in the primate. — T. Sjøvold: A report on the heritability of some cranial measurements and non-metric traits. — J. G. Rhoads: Improving the sensitivity, specificity, and appositeness of morphometric analyses. — S. R. Wilson: Towards an understanding of data in physical anthropology. — I. Schwidetzky: Data banks and multivariate statistics in physical anthropology. — J.-P. Bocquet-Appel: Biological evolution and history in 19th century Portugal. — On the determination of hominid affinities. — A. Bilsborough: Multivariate analysis and cranial diversity in plio-pleistocene hominids. — D. W. Read: From multivariate statistics to natural selection: a reanalysis of plio-pleistocene hominid dental material.*

Statistics and probability. — Proceedings of the 3rd Pannonian symposium on mathematical statistics, Visegrad, Hungary, 13-18 September, 1982. — Edited by J. Mogyoródi, I. Vincze, W. Wertz. — Un vol. relié, 16,5 × 24,5, de x, 415 p. — Prix: Dfl 180.00. — D. Reidel publishing company, Dordrecht/Boston/Lancaster, 1984.

The aim of the Pannonian symposia is to create a forum for recent results obtained by statisticians from the eastern part of Central Europe (in Roman times, known as the province of Pannonia). The present volume, which is the result of fruitful collaboration between the Eötvös Lorand University of Budapest and the Technical University of Vienna, contains contributions on the theory of probability in abstract spaces, on martingale theory (maximal inequalities and stochastic games), on Markov chains (urn models, replacements) and point processes on classical probability distributions (superposition, compounding, mixture and characterization), on stochastic mathematical programming problems (Monte Carlo techniques, optimization) and on statistical problems as commutation matrices and singular values

decomposition of real matrices with statistical applications, randomly censored data, polynomial regression, symmetric statistics, linear models and multivariate mixed models.

Methods in ring theory. — Edited by F. van Oystaeyen. — *NATO ASI series* (Advanced Science Institutes series). Series C: mathematical and physical sciences, vol. 129. — Un vol. relié, 16,5 × 24,5, de VIII, 576 p. — Prix: Dfl 195.00. — D. Reidel publishing company, Dordrecht/Boston/Lancaster, 1984.

J. Alajbegovic: *R*-Prüfer rings and approximation theorems. — *T. Albu*: Certain Artinian lattices are Noetherian. Applications to the relative Hopkins-Levitzki theorem. — *J. L. Bueso and P. Jara*: A generalization of semisimple modules. — *S. Caenepeel*: Graded complete and graded Henselian rings. — *B. Fein and M. Schacher*: Cyclic classes in relative Brauer groups. — *K. R. Goodearl*: Simple Noetherian non-matrix rings. — *R. Gordon*: Group-gradings of categories. — *W. Haboush*: Brauer groups of homogeneous spaces I. — *M. Harada*: Simple submodules in a finite direct sum of uniform modules. — *R. T. Hoobler*: Functors of graded rings. — *A. Hudry*: Sur une classe d'algèbres filtrées. — *Y. Iwanaga*: Some special class of Artin rings of finite type. — *E. Jespers and P. F. Smith*: Group rings and maximal orders. — *T. Kanzaki*: A note on infinite torsion primes of a commutative ring. — *I. Kersten and J. Michalíček*: Applications of Kummer theory without roots of unity. — *A. A. Klein*: The index of nility of a matrix ring over a ring with bounded index. — *J. Krempa and J. Matczuk*: On algebraic derivations of prime rings. — *L. Le Bruyn*: Smooth maximal orders in quaternion algebras I. — *M. Lorenz*: Group rings and division rings. — *L. Makar-Limanov*: On free subobjects of skew fields. — *W. S. Martindale, 3rd and C. R. Miers*: Herstein's Lie and Jordan theory revisited. — *H. Marubayashi*: Divisorially graded orders in a simple Artinian ring. — *K. Masaike*: Δ -injective modules and *QF-3* endomorphism rings. — *S. Montgomery*: Group actions on rings: some classical problems. — *B. J. Müller*: Links between maximal ideals in bounded Noetherian prime rings of Krull dimension one. — *I. N. Musson*: Noetherian subrings of quotient rings. — *C. Nastasescu and S. Raianu*: Stability conditions for commutative rings with Krull dimension. — *D. S. Passman*: Cancellative group-graded rings. — *M. Pittaluga*: The automorphism group of a polynomial algebra. — *K. W. Roggenkamp*: Auslander-Reiten quivers for some Artinian torsion theories and integral representations. Automorphisms and isomorphisms of integral group rings of finite groups. — *H. Sato*: Self-injective dimension of serial rings. — *W. F. Schelter*: Smooth affine *PI* algebras. — *A. H. Schofield*: Questions on skew fields. — *S. K. Sehgal*: Torsion units in group rings. — *J.-P. Tignol*: On the length of decompositions of central simple algebras in tensor products of symbols. — *M. Van den Bergh*: A duality theorem for Hopf algebras. — *F. Van Oystaeyen*: Note on central class groups of orders over Krull domains. — *A. Verschoren*: On the Picard group of a quasi-affine scheme. — *J. L. Zelmanowitz*: Duality theory for quasi-injective modules.

Geostatistics for natural resources characterization, Part 1 and 2. — Proceedings of a NATO Advanced Study Institute, Stanford Sierra Lodge, South Lake Tahoe, California, U.S.A., September 6-17, 1983. — Edited by G. Verly, M. David, A. G. Journel, A. Marechal. — *NATO ASI series*. Series C: mathematical and physical sciences, vol. 122. — 2 vol. reliés, de xxxiii, 1092 p. — Prix: Dfl 355.00. — D. Reidel publishing company, Dordrecht/Boston/Lancaster, 1984.

This second NATO ASI "Geostat — Tahoe 1983", was intended as a high-level teaching activity yet opened to all new ideas and contributions to the discipline of geostatistics. It was expected that the institute would bridge the gap since "Geostat — Roma 1975", and establish the state of the art of the discipline as of 1983. "Geostat — Tahoe 1983" fulfilled all expectations. The institute was attended by all major players in the field, representing evenly the academy and the industry of 23 different countries. Twelve guest lecturers were backed by some 50 original contributions. Particularly important for the future was the active participation of graduate students, giving evidence of the dynamism of a still very young discipline. Applications of geostatistics are no longer limited to the mining industry, and the original scope of the ASI had to be widened to witness the progress made in such fields as hydrology, soil sciences, pollution control and geotechnical engineering. Also important was the cross-fertilization from other statistical branches such as spectral analysis and robust statistics. The NATO ASI "Geostat — Tahoe 1983" will be remembered as a major milestone in the development of the discipline. — *Contents*: Variogram. — Precision of global estimation. — Kriging. — Indicator kriging. — Recoverable reserves. — Spectral analysis and data analysis. — Applications in the petroleum industry and automatics contouring. — Geotechnical applications. — Applications in hydrogeology and geochemical exploration. — Applications in pollution control and soil sciences. — Case studies in ore reserves estimation. — Simulation.

Dragoslav S. MITRINOVIĆ and Jovan D. KEČKIĆ. — **The Cauchy method of residues: theory and applications.** — Mathematics and its applications (East European series). — Un vol. relié, 15,5 × 23, de xiv, 361 p. — Prix: Dfl 180.00. — D. Reidel publishing company, Dordrecht/Boston/Lancaster, 1984.

This book is entirely devoted to calculus of residues and its applications to the theory of functions and equations, evaluation of complex and real integrals, summation of finite and infinite sums, expansions of functions into infinite series and products, ordinary and partial differential equations, integral equations, matrices, automatic regulation, special and elliptic functions, calculus of finite difference equations. The original mathematical papers used in the preparation stretch through the period from 1814 (the first paper by Cauchy on complex integration) until 1982. The last book published on the topic was written by Lindelöf in 1905 (reprinted 1947) and treats only limited aspects of the field. Besides, Lindelöf's book does not contain all the results published up to 1905 and these are included in the present volume. It does, therefore, fill a definite gap in the existing literature, extending and developing as it does, the theory of residues (residues of nonanalytic functions and functions in several variables are also included). — *Contents*: Introduction. — Definition and evaluation of residues. — Contour integration. — Applications of the calculus of residues in the theory of functions. — Evaluation of real definite integrals by means of residues. — Evaluation of finite and infinite sums by residues. — Differential and integral equations. — Applications of calculus of residues to special functions. — Calculus of finite differences. — Augustin-Louis Cauchy (Bibliography, scientific contributions, historical development of the calculus of residues).

Toma ALBU, Constantin NASTASESCU. — **Relative finiteness in module theory.** — Monographs and textbooks in pure and applied mathematics, vol. 84. — Un vol. relié, 16 × 23,5, de xii, 190 p. — Prix: FS 105.00. — Marcel Dekker, Inc., New York/Basel, 1984.

From the preface: "This volume is an expanded version of a seminar given by the authors at the University of Bucharest during the second half of the academic year 1978-1979. It is concerned with the study of some relative conditions which occur in the module theory, including relative injectivity, relative projectivity and especially relative chain conditions with respect to a Gabriel topology. The purpose of this volume is twofold: firstly to give a systematic treatment in a unified and simplified manner of known results on this subject, and secondly to present new developments due to authors." This volume includes an extensive bibliography pointing to the best sources for further research as well as more than 130 well-designed exercises.

Ted PETRIE, John D. RANDALL. — **Transformation groups on manifolds.** — Monographs and textbooks in pure and applied mathematics, vol. 82. — Un vol. relié, 16 × 23,5, de vii, 266 p. — Prix: FS 139.00. — Marcel Dekker, Inc., New York/Basel, 1984.

This book begins with an important introduction to this topic. Then, the authors focus on equivariant K -theory, equivariant surgery (highlighting material not previously published) and Smith equivalence of representations. Throughout the text, you'll find illustrations of actual applications, as well as carefully selected references that guide the reader easily to the best sources for further study. The volume is a superior reference for topologists, algebraists, number theoretists and mathematics researchers. Moreover, this work serves as a supplement to graduate-level courses in topology — with the prerequisites of one year graduate courses in algebraic topology and algebra.

Algebra and its applications. — Edited by H. L. Manocha and J. B. Srivastava. — Lecture notes in pure and applied mathematics, vol. 91. — Un vol. broché, 17,5 × 25, de xii, 395 p. — Prix: FS 168.00. — Marcel Dekker, Inc., New York/Basel, 1984.

This volume contains the papers presented to an international symposium which was organized by the Department of mathematics, Indian Institute of Technology, New Delhi, on December 21-25, 1981. This volume unites more than 50 distinguished mathematicians, spotlighting research that has demonstrated the importance of algebra in science and engineering. "Algebra and its applications" examines the Jacobian conjecture, vector bundles over affine varieties, quadratic spaces over the plane, norm residue homomorphism, partially ordered Grothendieck groups, automorphisms of group extensions, the free group ring, linear systems, Lie algebraic characterization of variable separation, coden and partial geometries, etc...

Mathematics: people, problems, results. — Edited by Douglas M. Campbell and John C. Higgins. — 3 vol. brochés, 18,5 × 23,5, de xvi, 304 p., iv, 275 p., et iv, 292 p. — Prix: \$37.75 les trois vol. (relié: \$53.95). — Wadsworth international, Belmont, California, 1984.

This three-volume anthology contains articles by more than eighty of the best mathematical expositors of our time. It is the first attempt in thirty years to present the whole of mathematics, its history and development, for general audiences. Rarely assuming more than elementary algebra, the selections include: *Bronowski*: The music

of the spheres and the idea of chance. — *Forsyth*: Old tripos days at Cambridge. — *Courant*: Gauss. — *Halmos, Heims and Stone*: Von Neumann. — *Dieudonné*: The work of Nicholas Bourbaki. — *Adler*: Mathematics and creativity. — *Davis and Hersch*: The Riemann hypothesis. — *Appel and Haken*: The four-color problem. — *Knuth*: Mathematics and computer science. — *Gringerich*: The computer versus Kepler. — *Le Corbusier*: Architecture and the mathematical spirit. — *Le Lionnais*: Beauty in mathematics. Other distinguished authors include: Ulam, Lefschetz, Polya, Segal, Robbins, Borel, Mosteller, Hilbert, Russell, von Neumann and many more. The anthology contains the following chapters: Historical sketches. — Some mathematical lives. — The development of mathematics. — The nature of mathematics. — Real mathematics. — Foundations and philosophy. — Computers. — Mathematics in art and nature. — Counting, guessing, using. — Sociology and education. To understand why mathematics exists and why it is perpetuated one must know something of its history and of the lives and results of famous mathematicians. This 3-volume collection of entertaining articles will captivate those with a special interest in mathematics as well as arouse those with even the slightest curiosity about the most sophisticated of sciences.

André GIROUX. — **Mathématiques pour chimistes.** — En collaboration avec Hubert Daoust. — Un vol. broché, 17,5 × 25,5, de 268 p. — Prix: C\$14.50. — Les Presses de l'Université de Montréal, 1983.

Fruit de plusieurs années d'expériences d'enseignement, cet ouvrage présente, au niveau d'un premier cycle universitaire, les méthodes mathématiques utilisées en chimie. Trois objectifs motivent cet ouvrage. Il s'agit d'abord pour l'étudiant d'acquérir une connaissance opérationnelle de certaines techniques mathématiques d'usage fréquent en chimie, telles que l'emploi des multiplicateurs de Lagrange, le calcul des déterminants ou la solution des équations différentielles. Il s'agit aussi pour lui de développer sa capacité de raisonner et d'affiner son sens critique; c'est ainsi que tant dans la présentation des sujets que dans le choix des exercices, ce manuel se veut plus qu'un livre de recettes. Finalement, la lecture de ce volume devrait lui permettre d'« apprivoiser » l'ensemble des mathématiques et de les percevoir comme un outil plutôt que comme un obstacle.

Laurent SCHWARTZ. — **Semimartingales and their stochastic calculus on manifolds.** — Edited by I. Iscoe. — Collection de la Chaire Aisenstadt. — Un vol. broché, 15 × 23,5, de 187 p. — Prix: C\$17.00. — Les Presses de l'Université de Montréal, Montréal, 1984.

Extrait de l'avant-propos de l'auteur: « Le présent livre... est un développement des leçons que j'ai données dans le cadre de la Chaire Aisenstadt à l'Université de Montréal en avril et août 1982. ... Les concepts développés ici avec des semimartingales générales non nécessairement liées au mouvement brownien ne sont pas usuels. De plus, leur définition intrinsèque en géométrie différentielle n'est pas courante dans la littérature anglo-américaine... ». — *Contents*: Background from the general theory of processes. Real stochastic integration. Semimartingale topologies. Square brackets. Integrability. Formal measures and formal semimartingales. Theorems of equivalence. Ito's formula. Semimartingales with values in a manifold. Stochastic integration on a manifold. The tangent space to a semimartingale and tangential representations. Stochastic differential equations. Lifting of a semimartingale with respect to a connection.

Christian GOUJET, Claire NICOLAS. — **Mathématiques appliquées: probabilités, initiations à la recherche opérationnelle.** — 2^e édition révisée. — Un vol. broché, 16 × 24, de 272 p. — Prix: FF 83.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1984.

Calcul des probabilités: axiomes de définition. — Les probabilités conditionnelles. — Les variables aléatoires. — Lois de probabilités discrètes. — Loi de Laplace-Gauss ou loi normale. — L'estimation statistique. — Notions sur la théorie des graphes. — Les problèmes de flots dans les graphes, algorithmes de Ford-Fulkerson. — La programmation linéaire, solutions graphiques, programme Dual. — La résolution des programmes linéaires par la méthode simplexe (méthode de Dantzig). — La gestion des stocks: modèles de gestion en avenir certain et en avenir aléatoire.

Jean-Pierre AUBIN. — **L'analyse non linéaire et ses motivations économiques.** — Collection « Mathématiques appliquées pour la maîtrise ». — Un vol. broché, 16 × 24, de 224 p. — Prix: FF 115.00. — Masson, Paris/New York/Barcelone/Milan/Mexico/Sao Paulo, 1984.

Problèmes de minimisation: les théorèmes généraux. — Fonctions convexes et théorèmes de proximation, de projection et de séparation. — Fonctions conjuguées et problèmes de minimisation convexes. — Sous-différentiels de fonctions convexes. — Propriétés marginales des solutions de problèmes de minimisation. — Gradients généralisés de fonctions localement lipschitziennes. — Jeux à deux personnes. Concepts fondamentaux et exemples. — Jeux à deux personnes et à somme nulle: les théorèmes de von Neumann et de Ky Fan. — Résolution d'équations non linéaires et d'inclusions. — Introduction à la théorie de l'équilibre économique. — Modèle de croissance de von Neumann. — Jeux à n personnes. — Jeux et jeux flous coopératifs. — Fascicule de résultats.

D. R. COX and D. OAKES. — **Analysis of survival data.** — Monographs on statistics and applied probability. — Un vol. relié, 14,5 × 22, de viii, 201 p. — Prix: £12.00. — Chapman and Hall, London/New York, 1984.

The statistical analysis of the duration of life has a long history. The recent surge of interest in the topic, with its emphasis on the examination of the effect of explanatory variables, stems mainly from medical statistics but also to some extent from industrial life testing. In fact the applications range much more widely, certainly from physics to econometrics. The essential element is the presence of a nonnegative response with appreciable dispersion and often with right censoring. The object of the present book is to give a concise account of the analysis of survival data. The authors have written both for the applied statisticians encountering problems of this type and also for a wider statistical audience wanting an introduction to the field.

Peter J. DIGGLE. — **Statistical analysis of spatial point patterns.** — Mathematics in biology. — Un vol. relié, 15,5 × 23,5, de ix, 148 p. — Prix: \$25.00. — Academic press, London/New York/Paris/San Diego/San Francisco/Sao Paulo/Sydney/Tokyo/Toronto, 1983.

A spatial point pattern is a set of points, irregularly distributed in an essentially planar region — for example, trees in a forest or cell nuclei in a microscopic tissue section. This book presents an up-to-date account of models and methods

used in the statistical analysis of spatial point patterns and their application to biological data. The study is divided into two parts. The first three chapters concentrate on tests of complete spatial randomness, while the last four are concerned with the formulation and fitting of a range of stochastic models. Both univariate and multivariate patterns are covered and numerous illustrative examples are provided using real biological data sets which are given in full as an appendix. The graphical presentation of results is emphasized and the book includes over eighty diagrams.

Iain G. MAIN. — **Vibrations and waves in physics.** — 2nd edition. — Un vol. broché, 15 × 22,5, de xvi, 356 p. — Prix: £9.95 (relié: £35.00). — Cambridge university press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

Free vibrations. — Free vibrations in physics. — Damping. — Damping in physics. — Forced vibrations. — Forced vibrations in physics. — Anharmonic vibrations. — Two-coordinate vibrations. — Non-dispersive waves. — Non-dispersive waves in physics. — Fourier theory. — Dispersion. — Water waves. — Electromagnetic waves. — De Broglie waves. — Solitary waves. — Plane waves at boundaries. — Diffraction.

Alexander OSTROWSKI. — **Collected mathematical papers, vol. 4: X: Real function theory, XI: Differential equations, XII: Differential transformations.** — Un vol. relié, 18 × 24, de 632 p. — Prix: FS 86.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1984.

Professor Ostrowski is one of the last great mathematicians to command a comprehensive knowledge of mathematical science while also having worked and published in virtually all of its branches. One owes to him fundamental results not only in pure mathematics — particularly in algebra, number theory, function theory, real analysis, and linear algebra — but also in applied mathematics, especially numerical analysis. His papers are of interest to algebraists, topologists, geometers, and analysts, as well as to numerical analysts and computer scientists. Of particular interest to numerical analysts are his investigations on the iterative solution of equations and systems of equations. Computer scientists are indebted to Ostrowski for the impetus he gave to a new branch of mathematics — complexity theory — as well as for establishing foundations of symbolic integration. The Ostrowski papers constitute the work of one of the most significant mathematicians of our time. To have them all — including many earlier works no longer readily accessible — united in six comprehensive volumes will be of inestimable importance to contemporary researchers.

D. V. LINDLEY and W. F. SCOTT. — **New Cambridge elementary statistical tables.** — Un vol. broché, 21,5 × 27,5, de 80 p. — Prix: £2.00. — Cambridge University press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1984.

The raison d'être of this set of tables is the same as that of the set it replaces, the "Cambridge elementary statistical tables" (Lindley and Miller, 1953), and is described in the first paragraph of their preface. This set of tables is concerned only with the commoner and more familiar and elementary of the many statistical functions and tests of significance now available. Each table is accompanied by a brief description of what is tabulated and, where the table is for a specific usage, a

description of that is given. With one exception, no attempt has been made to provide accounts of other statistical procedures that use the tables or to illustrate their use with numerical examples.

Spectral methods for partial differential equations. — Edited by Robert G. Voigt, David Gottlieb, and M. Yousuff Hussaini. — Un vol. relié, 18 × 26, de vii, 267 p. — Prix: £19.65. — Published by SIAM, Philadelphia, and distributed by John Wiley, 1984.

This book contains the proceedings of a symposium held at the NASA Langley research center, August 16-18, 1982. — *Contents: D. Gottlieb, M. Yousuff Hussaini and S. A. Orszag: theory and applications of spectral methods. — C. Canuto and A. Quarteroni: Variational methods in the theoretical analysis of spectral approximations. — D. Gottlieb, L. Lustman and C. Streett: Spectral methods for two-dimensional shocks. — D. B. Haidvogel: Eddy resolving modeling of ocean circulation processes using spectral methods. — M. Y. Hussaini and Th. A. Zang: Iterative spectral methods and spectral solutions to compressible flows. — L. Kleiser and U. Schumann: Spectral simulations of the laminar-turbulent transition process in plane Poiseuille flow. — D. Montgomery: Applications of spectral methods to turbulent magnetofluids in space and fusion research. — Y. Morchoisne: Inhomogeneous flow calculations by spectral methods: mono-domain and multi-domain techniques. — S. Osher: Smoothing for spectral methods. — J. E. Pasciak: Spectral methods for atmospheric laser calculations. — A. T. Patera: Spectral methods for spatially evolving hydrodynamic flows. — T. D. Taylor: Recent advances in pseudo-spectral methods.*

S. R. S. VARADHAN. — **Large deviations and applications.** — CBMS-NSF regional conference series in applied mathematics, vol. 46. — Un vol. broché, 17,5 × 25, de v, 75 p. — Prix: £9.25. — Society for industrial and applied mathematics, Philadelphia, 1984.

Large deviations. — Cramér's theorem. — Multidimensional version of Cramér's theorem. — An infinite dimensional example: Brownian motion. — The Ventcel-Freidlin theory. — The exit problem. — Empirical distributions. — The large deviation problem for empirical distributions of Markov processes. — Some properties of entropy. — Upper bounds. — Lower bounds. — Contraction principle. — Application to the problem of the Wiener sausage. — The polaren problem. — Bibliographical remarks.
