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Arnold Buffum CHACE. — **The Rhind mathematical papyrus.** — Un vol. relié, 28,5 × 22,5, de 160 p. — The National Council of Teachers of Mathematics, Reston, Virginia 22091, USA, 1979.

Le Papyrus Rhind est l'un des plus anciens traités de mathématiques connus : il date de 1650 avant notre ère et il est lui-même la copie d'un texte des années 1850-1800 av. J.C..

Ce Papyrus a été découvert à Luxor par Henry Rhind en 1858. Il est actuellement conservé au British Museum et reste notre principale source de connaissances des mathématiques de l'Ancienne Egypte. Le document se présente sous la forme d'un rouleau d'environ 30 cm de large sur 6 m de long. Il est écrit en hiératique, qui est la forme cursive de l'écriture hiéroglyphique.

C'est une reproduction photographique du Papyrus qui constitue le centre de l'ouvrage d'Arnold Buffum Chace, *The Rhind Mathematical Papyrus*, édité en 1979. Après quelques instants d'émotion passés à contempler les photographies, le lecteur peut suivre la longue étude qui les accompagne, et dont les étapes sont les suivantes :

- 1) Reproduction à plus grande échelle de l'écriture hiératique du scribe.
- 2) Transcription de cette écriture en hiéroglyphes.
- 3) Remplacement des hiéroglyphes par des consonnes de notre alphabet.
- 4) Copie de gauche à droite des consonnes, pour retrouver le sens de notre écriture.
- 5) Traduction mot à mot du texte obtenu.
- 6) Traduction libre plus intelligible.

Arnold Buffum Chace a ainsi accompli un travail considérable, mais je regrette un peu, personnellement, que cette édition en ait conservé la lettre plutôt que l'esprit : en effet, l'auteur a publié ses recherches sous la forme de deux volumes, parus en 1927 et 1929. Le premier volume comprend une étude approfondie des calculs, des unités de mesure et des connaissances géométriques des Egyptiens, ainsi que la traduction libre et commentée qui est la dernière étape que nous avons mentionnée. Le second volume présente les reproductions photographiques et, pour un très grand nombre de problèmes, les cinq premières étapes de la traduction.

La pensée d'Arnold Buffum Chace aurait-elle été trahie si, au lieu de relier les deux volumes l'un après l'autre, l'éditeur, The National Council of Teachers of Mathematics, avait pris l'initiative de réunir, pour chaque problème, la sixième étape aux cinq premières ? Je pense qu'au contraire le lecteur aurait alors bénéficié d'une vue plus complète de la méthode qui nous a rendu le Papyrus Rhind accessible.

Quelles sont les connaissances des Anciens Egyptiens que nous révèle le Papyrus ?

Les Egyptiens connaissaient deux sortes de nombres:

- une série croissante de 1 à 1 000 000,
- une série décroissante, composée de  $2/3$  et de  $1/2, 1/3, 1/4, \dots$

Des combinaisons des nombres des deux séries étaient possibles, les fractions devant toutes être différentes, et leur somme étant presque toujours inférieure à l'unité. Les Egyptiens multipliaient presque toujours par duplications successives, et effectuaient leurs divisions par essais. Ils utilisaient cependant des méthodes spéciales pour écrire, avec les seules fractions qu'ils connaissaient, les résultats des opérations: le procédé le plus fréquent consistait à rechercher certaines parts d'un nombre qui était choisi pour faciliter les calculs.

C'est cette même méthode que l'on retrouve employée dans la résolution des problèmes du Papyrus, et qui est connue sous le nom de « fausse position »: les Egyptiens étudiaient leur problème pour un certain nombre, puis ils cherchaient la relation existant entre ce nombre et la solution, ce qui leur permettait de calculer cette dernière.

Le Papyrus nous a également permis de connaître les unités de mesure des Egyptiens et de comprendre comment ils effectuaient leurs calculs d'aires, de volumes, ainsi que quelques résolutions de pyramides, où la trigonométrie émet ses premiers balbutiements. Retenons une bonne valeur approchée de l'aire du disque, correspondant à la formule:

$$(d - \frac{1}{9}d)^2$$

où  $d$  est le diamètre, et qui revient pour nous à utiliser une valeur de  $\pi$  voisine de 3,16.

Le National Council of Teachers of Mathematics suggère dans son avertissement au lecteur quelques utilisations possibles de l'ouvrage dans l'enseignement:

« On peut acquérir une bonne pratique de l'arithmétique en résolvant des problèmes par la méthode de la fausse position, et une bonne intuition algébrique en déterminant quels sont les types d'équations linéaires pour lesquelles la méthode donne des résultats valables. Evaluer la précision du calcul de l'aire du disque par les Anciens Egyptiens peut engendrer un excellent échange de vues sur la nature de  $\pi$ , d'une démonstration, d'une valeur approchée, de l'origine des idées dans le domaine mathématique, et sur l'évolution et la nature grandissante des mathématiques elles-mêmes. »

Appel qui sera, espérons-le, entendu par tous. (*Analyse de Jean CESAR.*)

Susan MONTGOMERY. — **Fixed rings of finite automorphism groups of associative rings.** — Lecture Notes in Mathematics, vol. 818. — Un vol. broché,  $16,5 \times 24$ , de vii, 126 p. — Prix: DM 18.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

Preliminaries. — Rings with no  $|G|$ -torsion: existence of fixed elements, the prime radical and Jacobson radical of  $R^G$ . — Simple rings: inner and outer automorphisms, simple fixed rings,  $R$  as an  $R^G$ -module. — Inner and outer automorphisms of semi-prime rings. — Rings with no nilpotent elements: existence of fixed elements and traces. — Chain conditions. — Polynomial identities. — Skew group rings and applications to modules.

William ABIKOFF. — **The real analytic theory of Teichmüller space.** — Lecture Notes in Mathematics, vol. 820. — Un vol. broché,  $16,5 \times 24$ , de vii, 144 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*The classical results of Fricke and Teichmüller on Riemann's problem of the moduli of Riemann surfaces: Uniformization and Fuchsian groups. Grötzsch's problem. Teich-*

müller's uniqueness theorem. Teichmüller's existence theorem. Teichmüller space. Historical notes. — *Topics in Teichmüller theory*: Punctured surfaces with boundary and their Teichmüller spaces. The Teichmüller modular group and the Riemann space. Augmented moduli space. — *The classification of the diffeomorphisms of surfaces of finite type and group actions on Teichmüller space*: Ber's extremal problem and the computations for punctured tori. Periodic diffeomorphisms and elliptic transformations. Irreducible diffeomorphisms and hyperbolic transformations. Relative Teichmüller spaces and the fractional twist group. Concluding remarks.

**Global theory of dynamical systems.** — Proceedings of an international conference held at Northwestern university, Evanston, Illinois, June 18-22, 1979. — Edited by Z. Nitecki and C. Robinson. — Lecture Notes in Mathematics, vol. 819. — Un vol. broché,  $16,5 \times 24$ , de ix, 499 p. — Prix: DM 53.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

34 exposés par: Daniel Asimov and Herman Gluck. — Louis Block, John Guckenheimer, Michal Misiurewicz and Lai-Sang Young. — Robert Burton and Robert W. Easton — Carmen Chicone and R. C. Swanson. — C. Conley. — Joseph G. Conlon. — Ethan M. Coven and William L. Reddy. — J. H. Curry. — Robert L. Devaney. — John M. Franks. — John M. Franks and Bob Williams. — David Fried. — Herman Gluck. — John Guckenheimer. — C. S. Hartzman and D. R. Naugler. — M. V. Jakobson. — Sveltana R. Katok. — H. B. Keynes and D. Newton. — Yuri Kifer. — Mark Levi. — W. de Melo and J. Palis. — Dean A. Neumann. — S. E. Newhouse. — Zbigniew Nitecki. — Carles Perello. — Everett Pitcher. — David Ruelle and Michael Shub. — Stephen Schecter and Michael F. Singer. — Douglas Shafer. — Carles Simo. — Floris Takens. — Russel B. Walker. — F. Wesley Wilson. — E. C. Zeeman.

**Statistique non paramétrique asymptotique.** — Actes des journées statistiques, Rouen, France, Juin 1979. — Edité par J. P. Raoult. — Lecture notes in Mathematics, vol. 821. — Un vol. broché,  $16,5 \times 24$ , de vii, 175 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*F. H. Ruymgaart*: A unified approach to the asymptotic distribution theory of certain midrank statistics. — *S. Balacheff, G. Dupont*: Normalité asymptotique des processus empiriques tronqués et des processus de rang (cas multidimensionnel mélangeant). — *M. Harel*: Convergence en loi pour la topologie de Skorohod du processus empirique multidimensionnel normalisé tronqué et semi-corrigé (étude au voisinage de la frontière inférieure de  $[0, 1]^{1+K}$ ). — *L. Rüschendorf*: Weak convergence of weighted multi-parameter empirical process. — *P. Deheuvels*: Non parametric tests of independence. — *W. Albers*: Asymptotic expansions for the power of adaptive rank tests in the one-sample problem. — *G. Collomb*: Estimation de la régression par la méthode des  $k$  points les plus proches avec noyau: quelques propriétés de convergence ponctuelle.

**Séminaire Pierre Lelong — Henri Skoda (Analyse), Années 1978/79.** — Edité par Pierre Lelong et Henri Skoda. — Lecture notes in Mathematics, vol. 822. — Un vol. broché,  $16,5 \times 24$ , de viii, 356 p. — Prix: DM 39.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

23 exposés par: D. Barlet. — J.-A. Barroso. — U. Cegrell. — J.-F. Colombeau. — H. El Mir. — R. Gay. — L. Gruman. — B. Jennane. — B. Kramm. — R. Langevin. —

P. Lelong. — I. Lieb. — J.-Ch. Moreau. — L. Schwartz. — A. Sebbar. — N. Sibony et Pit-Mann Wong. — H. Skoda. — M. Valdivia. — J.-P. Vigué. — M. Waldschmidt.

Josef KRAL. — **Integral operators in potential theory.** — Lecture Notes in Mathematics, vol. 823. — Un vol. broché,  $16,5 \times 24$ , de III, 171 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

Weak normal derivatives of potentials. — Double layer potentials. — Contractivity of Neumann's operator. — Fredholm radius of the Neumann operator. — Boundary value problems. — Comments and references.

**The Kleene symposium.** — Proceedings of the symposium held June 18-24, 1978 at Madison, Wisconsin, U.S.A. — Edited by Jon Barwise, H. Jerome Keisler, Kenneth Kunen. — Studies in logic and the foundations of mathematics, vol. 101. — Un vol. relié,  $16 \times 23$ , de XX, 425 p. — Prix: Dfl. 125.00. — North-Holland Publishing Company, Amsterdam/New York, Oxford, 1980.

INVITED PAPERS: *Stephen C. Kleene*: Recursive functionals and quantifiers of finite types revisited II. — *Peter Aczel*: Frege structures and the notions of proposition, truth and set. — *Robert L. Constable*: The role of finite automata in the development of modern computing theory. — *Haskell B. Curry*: Some philosophical aspects of combinatory logic. — *Dick H. J. de Jongh*: A class of intuitionistic connectives. — *Harvey Friedman*: A strong conservative extension of Peano arithmetic. — *Robert Gandy*: Church's thesis and principles for mechanisms. — *Alexander S. Kechris*: Recent advances in the theory of higher level projective sets. — *Joan Rand Moschovakis*: Kleene's realizability and "divides" notions for formalized intuitionistic mathematics. — *Anil Nerode and Richard A. Shore*: Second order logic and first order theories of reducibility orderings. — *Gerald E. Sacks*: Post's problem, absoluteness and recursion in finite types. — *Dana Scott*: Lambda calculus: some models, some philosophy. — *Stephen G. Simpson*: The hierarchy based on the jump operator. — *A. S. Troelstra*: Extended bar induction of type zero. — *Richard Vesley*: Intuitionistic analysis: the search for axiomatization and understanding. — CONTRIBUTED PAPERS: *Robert P. Daley*: The busy beaver method. — *Karel Hrbacek and Stephen G. Simpson*: On Kleene degrees of analytic sets. — *David P. Kiersteadt*: A semantics for Kleene's  $j$ -expressions. — *Phokion G. Kolaitis*: Recursion and non-monotone induction in a quantifier. — *Shih-Chao Liu*: A proof-theoretic approach to non-standard analysis with emphasis on distinguishing between constructive and non-constructive results. — *Arnold W. Miller*: Covering  $2^\omega$  with  $\omega_1$  disjoint closed sets. — *Peter M. Winkler*: Computational characterization of abelian groups.

Bonnie AVERBACH, Orin CHEIN. — **Mathematics: problem solving through recreational mathematics.** — A series of books in the mathematical sciences. — Un vol. relié,  $19 \times 24$ , XVI, 400 p. — Prix: £8.30. — W. H. Freeman and company, San Francisco, 1980.

Following the clues. — Solve it with logic. — From words to equations: algebraic recreations. — Solve it with integers: some topics from number theory. — More about numbers: bases and cryptarithmic. — Solve it with networks: an introduction to graph theory. — Games of strategy for two players. — Solitaire games and puzzles. — Pot-pourri. — Appendices: Some basic algebraic techniques. Mathematical induction.

**Mathematical methods in computer graphics and design.** — Based on the proceedings of the conference on mathematical methods in computer graphics and design, organized by the Institute of mathematics and its applications and held at the University of Leicester on September 28th, 1978. — Edited by K. W. Brodie. — Un vol. relié, 15,5 × 23,5, de XI, 147 p. — Prix: \$23.00. — Academic press, London/New York/Toronto/Sydney/San Francisco, 1980.

*K. W. Brodie*: A review of methods for curve and function drawing. — *D. C. Sutcliffe*: Contouring over rectangular and skewed rectangular grids: an introduction. — *M. A. Sabin*: Contouring a review of methods for scattered data. — *D. H. MacLain*: Interpolation methods for erroneous data. — *A. R. Forrest*: Recent work on geometric algorithms. — *I. C. Braid, R. C. Hillyard and I. A. Stroud*: Stepwise construction of polyhedra in geometric modelling.

Jane GROSSMAN, Michael GROSSMAN and Robert KATZ. — **The first systems of weighted differential and integral calculus.** — Un vol. broché, 15 × 23, de VI, 55 p. — Prix: \$3.00. — Archimedes Foundation, Rockport, Mass., 1980.

Classical calculus. — Weighted classical calculus. — Weighted non-Newtonian calculus.

Manfred KNEBUSCH, Winfried SCHARLAU. — **Algebraic theory of quadratic forms: generic methods and Pfister forms.** — Notes taken by Heisook Lee. — DMV seminar, vol. 1. — Un vol. broché, 15 + 23, de 44 p. — Prix: FS 7.50. — Birkhäuser Verlag, Boston/Basel/Stuttgart, 1980.

Introduction to quadratic forms and Witt rings. — Generic theory of quadratic forms. — Elementary theory of Pfister forms. — Generic theory of Pfister forms. — Fields with prescribed level. — Specialization of quadratic forms. — A norm theorem. — The generic splitting problem. — Generic zero fields. — Generic splitting towers. — The leading form. — The degree of a quadratic form. — Subforms of Pfister forms.

**Vector bundles and differential equations.** — Proceedings, Nice, France, June 12-17, 1979. — Edited by André Hirschowitz. — Progress in mathematics, vol. 7. — Un vol. broché, 15 × 22,5, de v, 249 p. — Prix: FS 27.00. — Birkhäuser-Verlag, Boston/Basel/Stuttgart, 1980.

*Wolf Barth*: Counting singularities of quadratic forms on vector bundles. — *Jean-Pierre Bourguignon*: Groupe de jauge élargi et connexions stables. — *G. Elencwajq, A. Hirschowitz, M. Schneider*: Les fibrés uniformes de rang au plus  $n$  sur  $P_n(\mathbb{C})$  sont ceux qu'on croit. — *O. Forster, A. Hirschowitz, M. Schneider*: Type de scindage généralisé pour les fibrés stables. — *Robin Hartshorne*: On the classification of algebraic space curves. — *Klaus Hulek*: On the classification of stable rank- $r$  vector bundles over the projective plane. — *J. Le Potier*: Stabilité et amplitude sur  $P_2(\mathbb{C})$ . — *Günther Trautman*: Zur Berechnung von Yang-Mills Potentialen durch holomorphe Vektorbündel.

John GUCKENHEIMER, Jürgen MOSER, Sheldon E. NEWHOUSE. — **Dynamical systems: C.I.M.E. lectures, Bressanone, Italy, June 1978.** — Progress in mathematics, vol. 8. — Un vol. broché, 15 × 22,5, de VIII, 289 p. — Prix: FS 30.00. — Birkhäuser-Verlag, Boston/Basel/Stuttgart, 1980.

*Sheldon E. Newhouse*: Lectures on dynamical systems. — *John Guckenheimer*: Bifurcations of dynamical systems. — *Jürgen Moser*: Various aspects of integrable Hamiltonian systems.

Stefan FENYÖ. — **Moderne mathematische Methoden in der Technik, Band 3.** — International series of numerical mathematics, vol. 18. — Un vol. relié,  $17 \times 24,5$ , de 347 p. — Prix: FS 84.00. — Birkhäuser-Verlag, Basel/Boston/Stuttgart, 1980.

*Theorie der linearen Operatoren*: Metrische Räume. Normierte Räume. Die Geometrie der Hilbert-Räume. Lineare Operatoren. Der Hahn-Banachscher Satz. Kompakte Operatoren. Lineare Operatoren im Hilbert-Raum. — *Lineare Integralgleichungen*: Die Volterrasche Integralgleichung. Die Fredholmsche Integralgleichung. Integralgleichungen mit selbsadjungierten Integraloperatoren. Integralgleichungen mit nicht-selbsadjungierten Integraloperatoren. — *Anwendungen der Integralgleichungen*: Anwendungen der Integralgleichungen auf Randwertaufgaben von gewöhnlichen Differentialgleichungen. Die Lösung der Potentialtheoretischen Grundaufgaben mit Hilfe von Einfacher- und Doppelschichten.

N. MAHAMMED, R. PICCININI, U. SUTER. — **Some applications of topological K-theory.** — North-Holland mathematics studies, vol. 45. — Notas de matematica, vol. 74. — Un vol. broché,  $16,5 \times 24$ , de ix, 317 p. — Prix: Dfl. 85.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1980.

*A review of K-theory. — The Hopf invariant*: Introduction. The Hopf invariant of maps from  $S^3$  onto  $S^2$ . The Hopf invariant of maps  $f: S^{2n-1} \rightarrow S^n$ . Cohomological interpretation of the Hopf invariant. *K*-theoretical solution of the Hopf invariant one problem and applications. — *Torsion free H-spaces of rank two*: Introduction. Hopf construction, projective plane and type of torsion free rank two *H*-spaces. Torsion free *H*-spaces of type (3, 7). The homotopy type classification. *K*-theoretical proof of the type classification theorem. — *Homotopy and stably complex structure*: The question of complex structure. Almost complex manifolds and stably complex manifolds. The homotopy type of  $M$  and  $\tilde{M}$ . The manifold  $\tilde{M}$  is not stably complex. — *Vector fields on spheres*: Introduction. Vector fields and sphere bundles over projective spaces. The *K*-theory of the projective spaces. Real vector fields on spheres. Cross-sections of complex Stiefel fibrations. Cross-sections of quaternionic Stiefel fibrations. — *Span of spherical forms*: Introduction and generalities about spherical forms. Vector fields on spherical forms. *G*-fibre homotopy *J*-equivalence. *G*-(Co) reducibility. Span of spherical forms of cyclic type. Span of spherical forms of quaternionic type. — *Immersions and embeddings of manifolds*: Background. A brief historical survey. Atiyah's criterion. About immersions and embeddings of lens spaces. The case of the  $Q_m$ -spherical forms. Parallelizability of the spherical forms. Immersions of complex projective spaces. — *Group homomorphisms and maps between classifying spaces; vector bundles over suspensions*: Generalities. Cartan-Serre-Whitehead towers and *H*-spaces. Remarks about the *KU*-theory of certain classifying spaces. A theorem of non-surjectivity for  $\alpha_{G,H}$ . Vector bundles over suspensions. — *On the index theorem of elliptic operators*: Introduction. The index of an elliptic differential operator. Four standard complexes. The index theorem. The generalized Lefschetz fixed-point formula.

M. C. CRABB. — **Z/2-homotopy theory.** — London Mathematical Society lecture note series, vol. 44. — Un vol. broché,  $15 \times 23$ , de iv, 128 p. — Prix: £6.95. — Cambridge University Press, Cambridge/London/New York/Rochelle/Melbourne/Sydney, 1980.

Introduction. — The Euler class and obstruction theory. — Spherical fibrations. — Stable cohomotopy. — Framed manifolds. — Appendix: On the Hopf invariant. —

*K*-theory. — The image of *J*. — The Euler characteristic. — Topological Hermitian *K*-theory. — Algebraic Hermitian *K*-theory. — Appendix: On the Hermitian *J*-homomorphism.

Neal KOBLITZ. — ***p*-adic analysis: a short course on recent work.** — London mathematical society lecture note series, vol. 46. — Un vol. broché, 15 × 23, de 163 p. — Prix: £6.75. — Cambridge University Press, Cambridge/London/New York/Rochelle/Melbourne, Sydney, 1980.

*Basics*: History (very brief). Basic concepts. Power series. Newton polygons. — *p*-adic  $\zeta$ -functions, *L*-functions and  $\Gamma$ -functions: Dirichlet *L*-series. *p*-adic measures. *p*-adic interpolation. *p*-adic Dirichlet *L*-functions. Leopoldt's formula for  $L_p(1, \chi)$ . The *p*-adic gamma function. The *p*-adic log gamma function. A formula for  $L'_p(0, \chi)$ . — *Gauss sums and the p-adic gamma function*: Gauss and Jacobi sums. Fermat curves. *L*-series for algebraic varieties. Cohomology. *p*-adic cohomology. *p*-adic formula for Gauss sums. Stickelberger's theorem.

Jean-Pierre LECOUTRE et Philippe PILIBOSSIAN. — **Analyse: exercices corrigés avec rappels de cours.** — Mathématiques pour les sciences économiques. — Un vol. broché, 16 × 24, de 208 p. — Masson, Paris/New York/Barcelone/Milan, 1980.

Fonction numérique d'une variable réelle. — Dérivées et différentielles. — Formule de Taylor et applications. — Fonctions puissance, logarithmique et exponentielle. — Calcul intégral. — Annales des D.E.U.G.

Jean-Pierre LECOUTRE et Philippe PILIBOSSIAN. — **Algèbre: exercices corrigés avec rappels de cours.** — Mathématiques pour les sciences économiques. — Un vol. broché, 16 × 24, de 216 p. — Masson, Paris/New York/Barcelone/Milan, 1980.

Eléments de la théorie des ensembles. — Analyse combinatoire. — Espaces vectoriels. — Applications linéaires. Déterminants. — Matrices. — Systèmes d'équations linéaires. Formes quadratiques. — Annales des D.E.U.G.

D. Frank HSU. — **Cyclic neofields and combinatorial designs.** — Lecture Notes in mathematics, vol. 824. — Un vol. broché, 16,5 × 24, de vi, 230 p. — Prix: DM 25.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*Additive structure in cyclic neofields*: Preliminary definitions and results. *XMP*- and *LXP*-admissible partitions of  $Z_{v-1}$ . *XIP*-admissible partitions of  $Z_{v-1}$ . — *Type a) XIP-neofields*: Additive structure in *SIP*-neofields. Non-existence theorems and the constructions. Construction of type a) iii) *XIP*-neofields. — *Construction of type b) XIP-neofields*: Construction of even order type b) *XIP* neofields. Construction of odd order type b) *XIP*-neofields. — *Construction of proper LXP- and proper XMP-neofields*: Combinatorial construction of proper *LXP*-neofields. Construction of even order *LXP*-neofields by a number theory technique. A product theorem and examples. Construction of proper *XMP*-neofields. — *Cyclic neofields and combinatorial designs*: Triple systems arising from *XIP*-neofields. Triple systems arising from even order *LXP*-neofields. Triple systems arising from even order *XMP*-neofields. A reconstruction theorem. The interrelation of cyclic neofields in terms of designs. — *Cyclic neofields and permutation matrices*: Definitions and relations. Decomposition theorem. Structure on *I*-matrices. Concluding remarks. — *Appendices*: Type a) *XIP*-admissible partitions. A list of all cyclic neofields of orders less than 11.

**Ring theory, Antwerp 1980.** — Proceedings, University of Antwerp U.I.A., Antwerp, Belgium, May 6-9, 1980. — Edited by F. van Oystaeyen. — Lecture Notes in Mathematics, vol. 825. — Un vol. broché, 16,5 × 24, de vii, 209 p. — Prix: DM 25.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*J. Bit-David, J. C. Robson*: Normalizing extensions, I. — *J. Bit-David*: Normalizing extensions, II. — *G. Cauchon*: Commutant des modules de longueur finie sur certaines algèbres filtrées. — *M. Chamarie*: Maximal orders applied to enveloping algebras. — *P. M. Cohn, M. Mahdavi-Hezavehi*: Extensions of valuations on skew fields. — *K. R. Goodearl*: Extensions of simple by simple unit-regular rings. — *R. Hart*: Invertible  $2 \times 2$  matrices over skew polynomial rings. — *S. Jøndrup*: Hereditary P. I. algebras. — *M.-P. Malliavin*: Grade et théorème d'intersection en algèbre non-commutative. — *C. Nastasescu*: Théorème de Hopkins pour les catégories de Grothendieck. — *R. Puystjens, H. De Smet*: The Moore-Penrose inverse for matrices over skew polynomial rings. — *K. W. Roggenkamp*: The lattice type of orders; a diagrammatic approach, I. — *J. P. Van Deuren, F. Van Oystaeyen*: Arithmetically graded rings, I. — *L. Van Leeuwen*: Radicals and chain conditions. — *F. Van Oystaeyen*: Graded Azumaya algebras and Brauer groups. — *A. Verschoren*: Birationality of P. I. rings and non-commutative varieties. — *E. Wexler-Kreindler*: Skew power series rings and some homological properties of filtered rings.

Philippe G. CIARLET, Patrick RABIER. — **Les équations de von Kármán.** — Lecture Notes in Mathematics, vol. 826. — Un vol. broché, 16,5 × 24, de vi, 181 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*Etablissement du modèle de von Kármán à partir d'un modèle non linéaire d'élasticité tridimensionnelle*: Etablissement du modèle tridimensionnel. Etude du modèle tridimensionnel. Un problème tridimensionnel de plaque; application de la méthode des développements asymptotiques. Equivalence du premier terme du développement avec la solution d'un modèle « déplacement » bidimensionnel. Equivalence avec les équations de von Kármán. — *Etude des équations de von Kármán: résultats d'existence: introduction à la bifurcation*: Résultats d'existence et de régularité pour le modèle « déplacement ». Résultats d'existence et de régularité pour le modèle de von Kármán. Introduction d'un paramètre; cas d'unicité de la solution; dégénérescence en un problème de membrane. Introduction à la bifurcation; quelques résultats généraux. Etude de la bifurcation dans les équations de von Kármán. — *Etude de la bifurcation perturbée dans les équations de von Kármán*: Position du problème. Réduction du problème. Etude des solutions  $\varepsilon$ -singulières des équations  $(E)$  et  $(E_\delta)$ . Détermination de l'ensemble des solutions de l'équation  $(E_\delta)$ . Application au problème initial. — *Notations, rappels et compléments*: Notations. Espaces de Sobolev: rappels généraux. Espaces de Sobolev: le cas des ouverts du plan.

**Ordinary and partial differential equations.** — Proceedings of the fifth conference held at Dundee, Scotland, March 29-31, 1978. — Edited by W. N. Everitt. — Lecture Notes in Mathematics, vol. 827. — Un vol. broché, 16,5 × 24, de xvi, 271 p. — Prix: DM 29.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*F. V. Atkinson*: Exponential behaviour of eigenfunctions and gaps in the essential spectrum. — *B. L. J. Braaksma*: Laplace integrals in singular differential and difference equations. — *David Colton*: Continuation and reflection of solutions to parabolic partial difference equations. — *W. N. Everitt*: Legendre polynomials and singular differential operators. — *Gaetano Fichera*: Singularities of 3-dimensional potential functions at the

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**Probability theory on vector spaces II.** — Proceedings, Błazejewko, Poland, September 17-23, 1979. — Edited by A. Weron. — Lecture Notes in Mathematics, vol. 828. — Un vol. broché, 16,5 × 24, de xiii, 324 p. — Prix: DM 34.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

30 exposés par: J. Burbea and P. Masani. — T. Byczkowski and T. Zak. — R. Carmona. — S. D. Chatterji. — Z. G. Gorgadze and V. I. Tarieladze. — M. G. Hahn and M. J. Klass. — A. Hulanicki. — T. Inglot. — R. Jajte. — Z. J. Jurek. — H.-H. Kuo. — V.V. Kvaratskhelia. — W. Linde, V. Mandrekar and A. Weron. — D. Louie and B. S. Rajput. — A. Makagon. — W. Mlak and F. H. Szafraniec. — H. Niemi. — A. Paszkiewicz. — V. Paulauskas. — E. Rychlik and Z. Rychlik. — F. Schmidt. — R. Shonkwiler. — Z. Suchanecki. — R. Sztencel. — J. Szulga. — V. I. Tarieladze. — Dang Hung Thang and Nguyen Zui Tien. — Nguyen Van Thu. — Nguyen Zui Tien and A. Weron. — M. R. Zeberski.

**Combinatorial mathematics VII.** — Proceedings of the seventh Australian conference on combinatorial mathematics held at the University of Newcastle, Australia, August 20-24, 1979. — Edited by R. W. Robinson, G. W. Southern, and W. D. Wallis. — Lecture Notes in Mathematics, vol. 829. — Un vol. broché, 16,5 × 24, de x, 256 p. — Prix: DM 29.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*R. G. Stanton and J. G. Kalbfleisch*: Introduction to Ramsey theory. — *R. Fuji-Hara and S. A. Vanstone*: On automorphisms of doubly resolvable designs. — *R. G. Stanton and J. A. Bate*: A computer search for  $B$ -coverings. — *R. G. Stanton and R. C. Mullin*: Some new results on the covering numbers  $N(t, k, v)$ . — *David Billington*: Degree sequences uniquely realisable by hypergraphs. — *T. M. Caelli*: On generating spatial configurations with identical interpoint distance distributions. — *D. de Caen and D. A. Gregory*: Prime Boolean matrices. — *Peter Eades*: Circulant  $(v, k, \mu)$  designs. — *R. B. Eggleton and D. A. Holton*: Pseudographic realizations of an infinitary degree sequence. — *L. R. Foulds and R. W. Robinson*: Determining the asymptotic number of phylogenetic trees. — *C. D. Godsil and B. D. McKay*: Graphs with regular neighbourhoods. — *Leslie M. Goldschlager*: An approximation algorithm for computing the permanent. — *Phil Hanlon*: The incidence algebra of a group reduced partially ordered set. — *Alan Hartman*: Doubly and orthogonally resolvable quadruple systems. — *M. D. Hendy*: Establishing the minimality of phylogenetic trees from protein sequences. — *Kevin McAvaney*: A conjecture on two-point deleted subgraphs of Cartesian products. — *Elizabeth J. Morgan*: Balanced ternary designs with block size three. — *A. Odlysko and B. Richmond*: On the compositions of an integer. — *Cheryl E. Praeger*: Symmetric graphs and a characterization of the odd graphs. — *J. Seberry*: Higher dimensional orthogonal designs and Hadamard matrices. — *Anne Penfold Street*: Some designs with block size three. — *Deborah J. Street and Christopher A. Rodger*: Some results on Bhaskar-Rao designs. — *Marta Sved*: Tales from the "County club".

Ronald L. GRAHAM, Bruce L. ROTHSCHILD, Joel H. SPENCER. — **Ramsey theory.** — Wiley-Interscience series in discrete mathematics. — Un vol. relié, 15,5 × 23, de ix, 174 p. — Prix: £11.75. — John Wiley and Sons, New York/Chichester/Brisbane/Toronto, 1980.

*Sets*: Ramsey's theorem abridged. Ramsey's theorem unabridged. Views of Ramsey theory. Ramsey theorems and density theorems. The compactness principle. A broader perspective. Original papers: Ramsey and Erdős-Szekeres. — *Progressions*: Van der Waerden's theorem. The Hales-Jewett theorem. Extensions and implications. Spaces-affine and vector. Roth's theorem and Szemerédi's theorem. Eeeeenormous upper bounds. — *Equations*: Schur's theorem. Regular homogeneous equations. Regular homogeneous systems. Finite sums and finite unions. Infinite sets of sums. Regular nonhomogeneous systems. — *Numbers*: Ramsey numbers — exact. Ramsey numbers — asymptotics. Van der Waerden numbers. The symmetric hypergraph theorem. Schur and Rado numbers. Property B. Higher Ramsey numbers. — *Particulars*: Bipartite Ramsey theorems. Induced Ramsey theorems. Restricted Ramsey results. Equations over Abelian groups. Canonical Ramsey theorems. Euclidean Ramsey theory. Graph Ramsey theory. — *Beyond combinatorics*: Topological dynamics. Ultrafilters. An unprovable theory. The infinite.

P.M.B. VITANYI. — **Lindenmayer systems: structure, languages, and growth functions.** — Mathematical centre tracts, vol. 96. — Un vol. broché, 16 × 24, de vii, 209 p. — Prix: Dfl. 25.00. — Mathematisch Centrum, Amsterdam, 1980.

*Introduction.* — *Definitions and preliminaries*: Formal grammars. Lindenmayer systems. — *L systems, sequences, and languages*: DOL systems. Deterministic context sensitive Lindenmayer systems without tables. Context sensitive table Lindenmayer systems and a trade-off equivalent to the LBA problem. Stable string languages of L systems. Context variable L systems and some simple regenerating structures. — *Growth functions*: DOL growth functions: analytical approach. DOL growth functions: combinatorial approach. Growth functions of context sensitive L systems. — *Physical time growth functions associated with Lindenmayer systems operating in physiological time*: Sigmoidal growth functions of Lindenmayer systems operating in physiological time. Some possible extensions and an interpretation in terms of table L systems. Final remarks. — *Epilogue: evaluation of results.*

R.D. GILL. — **Censoring and stochastic integrals.** — Mathematical centre tracts, vol. 124. — Un vol. broché, 16 × 24, de v, 178 p. — Prix: Dfl. 22.00. — Mathematisch Centrum, Amsterdam, 1980.

*Preliminaries*: Introduction. Notation. — *Some results from the theory of stochastic processes*: Notation and basic concepts. Stochastic integrals. Counting processes. A martingale central limit theorem and related results. — *Right censored observations and stochastic integrals*: Background. One sample case: the product limit estimator. Two sample case: the test statistics of Gehan, Efron and Cox. — *Asymptotic results*: Consistency of the product limit estimator and of test statistics of the class  $K^+$ . Weak convergence: general theorem and product limit estimator. Weak convergence: test statistics of the class  $K$ . — *Efficiencies and new test statistics*: Introduction; comparison of variance estimators. Efficiencies. Optimal tests of the class  $K$  for parametric alternatives. Renyi-type tests — *General censorship and truncation.* — *Appendices*: Proofs of theorems and lemmas.

R. EISING. — **2-D systems, an algebraic approach.** — Mathematical centre tracts, vol. 125. — Un vol. broché, 16 × 24, de vi, 141 p. — Prix: Dfl. 17.00. — Mathematisch Centrum, Amsterdam, 1980.

*Introduction and summary.* — *Linear systems over principal ideal domains*: General introduction. The impulse response. The formal power series approach. Free systems over a ring. Realizations of *I/O* systems over rings. — *Algorithms*: Matrices over a principal ideal domain. Realization algorithms for an impulse response. Realization algorithms for an *I/O* system given by a transfer matrix. Partial realizations. — *2-D systems*: Introduction. The ring of 1-*D* transfer functions:  $\mathbf{R}_c(s)$ . 2-*D* systems as 1-*D* systems over a principal ideal domain. Weakly causal 2-*D* systems. — *Refinement of the state space models and properties*: Stability. The ring of stable 1-*D* transfer functions. First level realizations of stable input/output systems and stabilization of 2-*D* systems. Canonical first level realizations over  $\mathbf{R}_c(s)$  and  $\mathbf{R}_\sigma(s)$ . Separability of 2-*D* transfer matrices. Invertibility of 2-*D* input/output systems. Reachability and observability of second level realizations. Low order second level realizations. Generic properties. — *Realization algorithms for 2-D systems*: Introduction. Factorization algorithms for matrices over  $\mathbf{R}_c(s)$  or  $\mathbf{R}_\sigma(s)$ . A realization algorithm for 2-*D* transfer matrices.

J. J. BURCKHARDT. — **Die Mathematik an der Universität Zürich: 1916-1950: unter den Professoren R. Fueter, A. Speiser, P. Finsler.** — Beihefte zur Zeitschrift „Elemente der Mathematik“, Bd. 16. — Un vol. broché, 17 × 24, de 48 p. — Prix: FS 18.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1980.

Einleitung. Räumliches: Karl Rudolf Fueter, Andreas Speiser, Paul Finsler. Weitere Dozenten in Mathematik, Vorlesungen in Mathematik von 1916 bis 1950. Nachweise. Verzeichnisse: R. Fueter, A. Speiser, P. Finsler.

**Combinatorial mathematics, optimal designs and their applications.** — Symposium held at Colorado state university, Fort Collins, Colorado, on June 5-9, 1978. — Edited by J. Srivastava. — Annals of discrete mathematics, vol. 6. — Un vol. relié, 17,5 × 24,5, de viii, 392 p. — Prix: Dfl. 140.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1980.

*A. Barlotti*: Results and problems in Galois geometry. — *R. C. Bose*: Combinatorial problems of experimental design II: factorial designs. — *P. J. Cameron and D. A. Drake*: Partial  $\lambda$ -geometries of small nexus. — *C.-S. Cheng and L. J. Gray*: A characterization of group-divisible designs and some related results. — *M. Deza*: On permutation cliques. — *M. Deza and N. M. Singhi*: Some properties of perfect matroid designs. — *D. Dumont and G. Viennot*: A combinatorial interpretation of the Seidel generation of Genocchi numbers. — *P. Erdős*: A survey of problems in combinatorial number theory. — *P. Erdős, F. Harary and M. Klawe*: Residually-complete graphs. — *D. Faota*: A combinatorial proof of Jacobi's identity. — *A. S. Fraenkel*: From Nim to Go. — *M. Hall, Jr.*: Configurations in a plane of order ten. — *N. Hamada and F. Tamari*: Construction of optimal codes and optimal fractional factorial designs using linear programming. — *A. Hedayat and S.-Y. R. Li*: Combinatorial topology and the trade off method in *BIB* designs. — *F. Hering*: Block designs with cyclic block structure. — *S. A. Joni and G.-C. Rota*: On restricted bases for finite fields. — *A. K. Kevorkian*: Partitioning of the minimum essential set construction problem. — *J. Kiefer*: Optimal design theory in relation to combinatorial design. — *D. J. Kleitman and K. J. Winston*: The asymptotic number of lattices. — *A. Lascoux and M. P. Schützenberger*: A new statistics on words. — *R. C. Mullin, P. J. Schellenberg, D. R. Stinson, and S. A. Vanstone*: Some results on the existence of

squares. — *R. Naik, S. B. Rao, S. S. Shrikhande and N. M. Singhi*: Intersection graphs of  $k$ -uniform hypergraphs. — *P. N. Rathie*: On some enumeration problems in graph theory. — *J. Seberry*: Some remarks on amicable orthogonal designs. — *E. Seiden*: On the number of nonisomorphic designs in a repeated measurement experiment. — *M. Simonovits and V. T. Sos*: Intersection theorems on structures. — *J. N. Srivastava and S. Ghosh*: Enumeration and representation of nonisomorphic bipartite graphs. — *R. P. Stanley*: Decompositions of rational convex polytopes. — *W. T. Tutte*: Rotors in graph theory. — *S. G. Williamson*: Embedding graphs in the plane, algorithmic aspects. — *S. Yamamoto and S. Tazawa*: Hyperclaw decomposition of complete hypergraphs.

Jean-Pierre KERNEVEZ. — **Enzyme mathematics.** — Studies in mathematics and its applications, vol. 10. — Un vol. relié,  $16 \times 23$ , de XIII, 262 p. — Prix: Dfl. 85.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1980.

*Diffusion and reaction in an enzyme membrane*: Motivation for studying artificial enzyme membranes. Enzyme kinetics. Enzyme membranes. Simple irreversible monoenzymatic reactions. Numerical solution. Mathematical methods. — *Glucose pump*: Description. Modeling. Numerical simulations. Mathematical analysis. — *Multiple steady states and hysteresis*: The zero-dimensional system. The one-dimensional system. Kubicek method of continuation. Mathematical analysis of the S-shaped curve. Stability. Justification of the quasi-steady-state hypothesis. — *Assemblages of cells and bifurcations*: Multiple cell assemblages. Two cell assemblage. Nonisolated solutions and bifurcation. Numerical analysis of bifurcations. Imperfections. — *The uricase system and pattern formation*: Presentation of the uricase system. Stability of the trivial steady state. Bifurcation from the trivial steady state. Numerical exploration of the steady states. — *Pattern formation in a monoenzyme membrane*: Pattern formation in fruitfly *Drosophila* imaginal disks. Description of the  $S$ - $A$  system. Linear stability analysis of the spatially uniform steady state  $u_0 = (\tilde{s}, \tilde{a})$ . Bifurcation analysis. Numerical methods and results. Mathematical technical details. — *Oscillations and wave front propagation*: Papain system. Uricase system. Wave front propagation in the  $s$ - $a$  system.

**Two decades of mathematics in the Netherlands: 1920-1940: a retrospection on the occasion of the bicentennial of the Wiskundig Genootschap.** — Ed. by E. M. J. Bertin, H. J. M. Bos, A. W. Grootendorst. — Deux vol. brochés,  $16 \times 24$ , de XXIV, 379 p. (pagination continue pour les deux vol.). — Prix: Dfl. 42.50 pour les deux vol. — Mathematical Centre, Amsterdam, 1978.

L. E. J. Brouwer on triangulation. — J. G. van der Corput on exponential sums and lattice points. — H. J. E. Beth on stabilization of instable equilibrium by means of gyroscopic forces. — H. D. Kloosterman on Kloosterman sums. — Balth. van der Pol on heartstirring heartbeats. — B. L. van der Waerden on arithmetic progressions in sets of integers. — J. A. Schouten and D. van Dantzig on Ricci-calculus and Kähler varieties. — A. Heyting on the formalization of intuitionistic mathematics. — E. J. Dijksterhuis on Eudoxos' theory of ratio. — H. Casimir and B. L. van der Waerden on full reducibility and the Casimir operator. — D. van Dantzig, a pioneer of topological algebra. E. R. van Kampen on calculating the fundamental group. — W. van der Woude on Noether's fundamental theorem. — Witold Hurewicz and the second chapter in homotopy theory. — Hans Freudenthal on vector lattices. — C. Visser and an operator algorithm at work. — Hans Freudenthal on suspension. — A. F. Monna on Dirichlet operators. — L. Kosten on traffic and queueing (the supplementary variable). — Chaque chapitre comporte une photographie, un article de base du mathématicien étudié, et un commentaire d'un autre mathématicien.

Philip D. STRAFFIN, Jr. — **Topics in the theory of voting.** — The UMAP expository monograph series. — Un vol. broché, 15,5 × 23,5, de ix, 69 p. — Prix: FS 12.00. — Birkhäuser, Boston/Basel/Stuttgart, 1980.

*Power in voting bodies*: The Shapley-Shubik index of voting power. Weighted voting bodies. The power of voting blocs. Committees. Decisions made by two or more voting bodies. — *Voting methods for more than two alternatives*: The weaknesses of sequential pairwise voting. Plurality voting. Plurality elimination procedures. The Borda count. Condorcet voting methods. Results of the axiomatic approach. Application to environmental decision making in the Bow River Valley. Application to multi-objective decisions by a single decision-maker. — *Recent approaches to voting using intensities of preference*: Cardinal utility. Approval voting. Voting by bids. Vickrey's scheme for sealed bidding. A preference revealing process: the Clarke tax. Problems with implementing the preference revealing process. Conclusions. — *Answers to selected problems.*

James C. FRAUENTHAL. — **Introduction to population modeling.** — Second printing. — The UMAP expository monograph series. — Un vol. broché, 15,5 × 23,5, de xviii, 186 p. — Prix: FS 18.00. — Birkhäuser, Boston/Basel/Stuttgart, 1980.

Simple single species population models. — Stochastic birth and death processes. — A two age group population model. — Time delayed logistic equations. — Population growth in a time-varying environment. — Stable points, stable cycles and chaos. — Introduction to two species models: predator-prey. — Competition and mutualism. — Quadratic two-species population models. — Three species competition. — Complexity versus stability. — Solutions to problems.

**Mathematical statistics and probability theory.** — Proceedings, sixth international conference, Wisła (Poland), 1978. — Edited by W. Klonecki, A. Kozek, and J. Rosinski. — Lecture notes in statistics, vol. 2. — Un vol. broché, 15 × 23,5, de xxii, 373 p. — Prix: DM 38.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1980.

*R. Bartoszynski*: Some thoughts about Jerzy Neyman. — *K. Doksum*: Some remarks on the achievements of Professor Neyman in the United States. — *K. Krickeberg*: Role of Jerzy Neyman in the shaping of the Bernoulli society. — *O. Aalen*: A model for nonparametric regression analysis of counting processes. — *R. Banys*: On superpositions of random measures and point processes. — *T. Bednarski*: Application and optimality of the chi-square test of fit for testing  $\epsilon$  — validity of parametric models. — *T. Calinski, B. Ceranka, S. Mejza*: On the notion of efficiency of a block design. — *D. M. Chibisov*: An asymptotic expansion for distributions of  $C(\alpha)$  test statistics. — *Z. Ciesielski*: Properties of realizations of random fields. — *J. Cwik, T. Kowalczyk, A. Kowalski, E. Pleszczyńska, W. Szczesny, T. Wierzbowska*: Monotone dependence function: background, new results and applications. — *K. A. Doksum*: Lifetesting for matched pairs. — *N. Gaffke, O. Krafft*:  $D$ -optimum designs for the interblock-model. — *S. Gnot*: Locally best linear estimation in Euclidean vector spaces. — *B. Grigelionis, R. Mikulevicius*: On statistical problems of stochastic processes with penetrable boundaries. — *P. Hellmann*: On two-sided nonparametric tests for the two-sample problem. — *A. Jakubowski*: On limit theorems for sums of dependent Hilbert space valued random variables. — *J. Kleffe*: C. R. Rao's MINQUE for replicated and multivariate observations. — *W. Klonecki*: Invariant quadratic unbiased estimation for variance components. — *A. Kłopotowski*: Mixtures of infinitely divisible distributions as limit laws for sums of dependent random variables. — *A. Kozek, Z. Suchanecki*: Conditional expectations of selectors

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M. ATTEIA, D. BANCEL, I. GUMOWSKI. — **Nonlinear problems of analysis in geometry and mechanics.** — Research notes in mathematics, vol. 46. — Un vol. broché,  $17 \times 25$ , de vi, 208 p. — Prix: £8.50. — Pitman Advanced Publishing Program, Boston/London/Melbourne, 1980.

22 exposés par: H. Brezis. — G. Duvaut. — E. Giusti. — J. J. Moreau. — O. E. Rössler. — R. Temam. — M. Atteia, J. P. Dedieu. — J. Audounet, Daniel Bancel. — J. Banger, T. Dumont. — R. L. Clerc, C. Hartmann. — J. Couot. — P. Destuynder. — A. Fougères. — H. Gouin. — S. Kesavan. — J. Llibre. — M. Madaune-Tort. — M. Potier-Ferry. — P. Rabier. — C. Simo. — P. M. Suquet. — L. Véron.

Kurt MAHLER. — **p-adic numbers and their functions.** — Second edition. — Cambridge tracts in mathematics, vol. 76. — Un vol. relié,  $15 \times 22,5$ , de x, 320 p. — Prix: £19.00. — Cambridge University Press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1981.

*Numbers*:  $g$ -adic values of rational numbers. Pseudo-valuations and valuations.  $g$ -adic and  $p$ -adic numbers. The arithmetic of  $Q_g$  and  $Q_p$ . The decomposition of  $Q_g$  into  $p$ -adic fields. The quadratic extension fields of  $Q_p$ . — *Functions*: Elementary topological properties of  $R$ ,  $Q_p$ , and  $Q_g$ . First properties of continuous  $g$ -adic functions. The interpolation series of a  $g$ -adic function. Characterisation of functions with the properties  $(N)$  and  $(W)$ . Further properties of  $p$ -adic functions. Remarks on functions of two variables. The derivative of a function on  $J$  or  $I_p$ . Higher derivatives. The Dieudonné integral. The van der Put series and integral. Definite integrals and difference equations. Functions on the quadratic extension fields of  $Q_p$ .

Gérard COEURE. — **Méthodes mathématiques pour la physique et les sciences appliquées.** — Dunod université: Ouvrages de spécialité. — Un vol. broché,  $15,5 \times 24$ , de ix, 166 p. — Dunod, Paris, 1980.

*Suites et séries de fonctions*: Convergence uniforme. Convergence normale. Critère de Cauchy. Méthode de sommation d'Abel. — *Séries de Fourier*: Convergence ponctuelle. Théorème de Parseval. — *Systèmes de convolution périodiques*: Produit de convolution. Systèmes de convolution. Etude des cordes vibrantes. — *Complément de calcul intégral*: Intégrales multiples. Théorème de Fubini. Changement de variables. Intégrales de surface. Fonctions définies par une intégrale. Potentiel de simple couche. Intégration des séries. — *Calcul symbolique et équations de convolution*: Produit de convolution. Algèbre

des signaux. Résolution de systèmes différentiels. — *Transformations de Laplace et de Fourier* : Théorème de Riemann-Lebesgue. Inversion des transformations de Laplace et de Fourier. Transformation de Fourier à plusieurs variables; équation de la chaleur. — *Analyse vectorielle* : Formes différentielles. Théorèmes de Stokes et Poincaré. Champs de vecteurs. Théorème de Gauss. Potentiels. — *Fonctions holomorphes* : Fonctions holomorphes élémentaires. Théorème de Morera. Formules de Cauchy. Primitive d'une fonction holomorphe. — *Analyticité des fonctions holomorphes* : Série de Taylor. Propriété des zéros isolés. Principe du maximum. Théorème de DAlembert. Fonctions méromorphes. Théorème des résidus. Théorème de Rouché. Lemmes de Jordan. — *Représentation conforme* : Théorème de Riemann. Fonctions harmoniques. Noyau de Poisson. Fonction de Green. — *Fonctions spéciales et équation des ondes* : Fonction Gamma. Fonction B. Formule de Stirling. Fonctions, équations de Bessel.

**Handbook of statistics, vol. I: Analysis of variance.** — Edited by P. R. Krishnaiah. — Un vol. relié, 18 × 24,5, de xvi, 1002 p. — Prix: Dfl. 275.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1980.

*C. R. Rao and J. Kleffe* : Estimation of variance components. — *N. H. Timm* : Multivariate analysis of variance of repeated measurements. — *S. Geisser* : Growth curve analysis. — *S. J. Press* : Bayesian inference in MANOVA. — *R. Gnanadesikan* : Graphical methods for internal comparisons in ANOVA and MANOVA. — *S. Das Gupta* : Monotonicity and unbiasedness properties of ANOVA and MANOVA tests. — *P. K. Ito* : Robustness of ANOVA and MANOVA test procedures. — *D. R. Brillinger* : Analysis of variance and problems under time series models. — *K. V. Mardia* : Tests of univariate and multivariate normality. — *G. Kaskey, B. Kolman, P. R. Krishnaiah and L. Steinberg* : Transformations to normality. — *V. P. Bhapkar* : ANOVA and MANOVA: models for categorical data. — *D. A. S. Fraser* : Inference and the structural model for ANOVA and MANOVA. — *T. A. Bancroft and C. P. Han* : Inference based on conditionally specified ANOVA models incorporating preliminary testing. — *C. G. Khatri* : Quadratic forms in normal variables. — *S. K. Mitra* : Generalized inverse of matrices and applications to linear models. — *P. R. Krishnaiah and J. C. Lee* : Likelihood ratio tests for mean vectors and covariance matrices. — *A. J. Izenman* : Assessing dimensionality in multivariate regression. — *H. Bunke* : Parameter estimation in nonlinear regression models. — *H. L. Harter* : Early history of multiple comparison tests. — *A. R. Sampson* : Representations of simultaneous pairwise comparisons. — *P. R. Krishnaiah, G. S. Mudholkar and P. Subbaiah* : Simultaneous test procedures for mean vectors and covariance matrices. — *P. K. Sen* : Nonparametric simultaneous inference for some MANOVA models. — *R. D. Bock and D. Brandt* : Comparison of some computer programs for univariate and multivariate analysis of variance. — *P. R. Krishnaiah* : Computations of some multivariate distributions. — *P. R. Krishnaiah and M. Yochmowitz* : Inference on the structure of interaction in two-way classification model.

**Kenneth KUNEN.** — **Set theory: an introduction to independence proofs.** — Studies in logic and the foundations of mathematics, vol. 102. — Un vol. relié, 15,5 × 23, de xvi, 313 p. — Prix: Dfl. 60.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1980.

*Introduction* : Consistency results. Prerequisites. Outline. How to use this book. What has been omitted. On references. The axioms. — *The foundations of set theory* : Why axioms? Why formal logic? The philosophy of mathematics. What we are describing. Extensionality and comprehension. Relations, functions, and well-ordering. Ordinals.

Remarks on defined notions. Classes and recursion. Cardinals. The real numbers. Appendices: other set theories, eliminating defined notions, formalizing the metatheory. — *Infinitary combinatorics*: Almost disjoint and quasi-disjoint sets. Martin's axiom. The Suslin problem. Trees. The c.u.b. filter. — *The well-founded sets*: Introduction. Properties of well-founded sets. Well-founded relations. The axiom of foundation. Induction and recursion on well-founded relations. — *Easy consistency proofs*: Three informal proofs. Relativization. Absoluteness. The last word on foundation. More absoluteness. Reflection theorems. Appendices: more on relativization, model theory in the metatheory, model theory in the formal theory. — *Defining definability*: Formalizing definability. Ordinal definable sets. — *The constructible sets*: Basic properties of  $L$ .  $ZF$  in  $L$ . The axiom of constructibility. — *Forcing*: General remarks. Generic extensions. Forcing. Forcing with finite partial functions. Forcing with partial functions of larger cardinality. Embeddings, isomorphisms, and Boolean-valued models. Further results. Appendix: other approaches and historical remarks. — *Iterated forcing*: Products. More on the Cohen model. The independence of Kurepa's hypothesis. Easton forcing. General iterated forcing. The consistency. Countable iterations. — Exercices à la fin de chaque chapitre.

Miguel de GUZMÁN. — **Real variable methods in Fourier analysis.** — North-Holland mathematics studies, vol. 46. — Notas de matemática, vol. 75. — Un vol. broché,  $16,5 \times 24$ , de XIII, 392 p. — Prix: Dfl. 90.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1981.

*Pointwise convergence of a sequence of operators*: Finiteness a.e. Continuity in measure of the maximal operator and a.e. convergence. — *Finiteness a.e. and the type of the maximal operator*: A result of A.P. Calderón on the partial sums of the Fourier series of  $f \in L^2(T)$ . Commutativity of  $T^*$  with mixing transformations. Positive operators. The theorem of Sawyer. Commutativity of  $T^*$  with mixing transformations. The theorem of Stein. The theorem of Nikishin. — *General techniques for the study of the maximal operator*: Reduction to a dense subspace. Covering and decomposition. Kolmogorov condition and the weak type of an operator. Interpolation. Extrapolation. Majorization. Linearization. Summation. — *Especial techniques for convolution operators*: The type  $(1, 1)$  of maximal convolution operators. The type  $(p, p)$ ,  $p > 1$ , of maximal convolution operators. — *Especial techniques for the type  $(2, 2)$* : Fourier transform. Cotlar's lemma. The method of rotation. — *Coverings, the Hardy-Littlewood maximal operator and differentiation. Some general theorems*: Some notation. Covering lemmas imply weak type properties of the maximal operator and differentiation. From the maximal operator to covering properties. Differentiation and the maximal operator. Differentiation properties imply covering properties. The halo problem. — *The basis of intervals*: The interval basis  $\mathcal{B}_2$  does not have the Vitali property. It does not differentiate  $L^1$ . Differentiation properties of  $\mathcal{B}_2$ . Weak type inequality for a basis which is the Cartesian product of another two. The halo function of  $\mathcal{B}_2$ . Saks rarity theorem. A theorem of Besicovitch on the possible values of the upper and lower derivatives with respect to  $\mathcal{B}_2$ . A theorem of Marstrand and some generalizations. A problem of Zygmund solved by Moriyón. Covering properties of the basis of intervals. A theorem of Córdoba and R. Fefferman. Another problem of Zygmund. Solution by Córdoba. — *The basis of rectangles*: The Perron tree. A lemma of Fefferman. The Kakeya problem. The Besicovitch set. The Nikodym set. Differentiation properties of some bases of rectangles. Some results concerning bases of rectangles in lacunary directions. — *The geometry of linearly measurable sets*: Linearly measurable sets. Density. Regular and irregular sets. Tangency properties. Projection properties. Sets of polar lines. Some applications. — *Approximations of the identity*: Radial kernels.

Kernels non-increasing along rays. A theorem of F. Zo. Some necessary conditions on the kernel to define a good approximation of the identity. — *Singular integral operators*: The Hilbert transform. The Calderón-Zygmund operators. Singular integral operators with generalized homogeneity. — *Differentiation along curves. A result of Stein and Wainger*: The strong type  $(2, 2)$  for a homogeneous curve. The type  $(p, p)$ ,  $1 < p < \infty$ , of the maximal operator. An application. Differentiation by rectangles determined by a field of directions. — *Multipliers and the Hardy-Littlewood maximal operator*: The characteristic function of the unit disk. A theorem of C. Fefferman. Polygons with infinitely many sides. The maximal operator, with respect to a collection of rectangles. A theorem of A. Córdoba and R. Fefferman.

G. VAN DER HOEK. — **Reduction methods in nonlinear programming.** — Mathematical centre tracts, vol. 126. — Un vol. broché,  $16 \times 24$ , de v, 194 p. — Prix: Dfl. 24.00. — Mathematisch Centrum, Amsterdam, 1980.

*Introduction and preliminary remarks*: Introduction and scope of the monograph. Preliminary remarks. — *A computational comparison of self scaling variable metric algorithms*: Self scaling variable metric algorithms. Optimally conditioned self scaling algorithms. Initial scaling of BFGS. Computational experiments. — *Recursive quadratic programming with self scaling updates of the second-order information*: Convergence properties of recursive quadratic programming. Algorithmic aspects of recursive quadratic programming. — *Asymptotic properties of reduction methods using linearly equality constrained reduced problems*: Definition and solution of linearly constrained reduced problems. Relation between the first order Kuhn-Tucker conditions of the original — and the reduced problems. — *Convergences of sequences of Kuhn-Tucker points*: Active set strategies. Convergence of the solutions of the reduced problems. Coordinating phase I and phase II. Convergence of the composite algorithm. — *Algorithmic and numerical aspects of 2-phase reduction methods*: Stepwise description of some 2-phase algorithms. An adapted algorithm for linearly constrained nonlinear programming and the structure of the 2-phase algorithm. Decomposition methods for matrices. Updating of the Cholesky factors. — *A computational comparison of 2-phase algorithms and recursive quadratic programming algorithms*: The design of computational experiments and the selection of testproblems. Termination criteria. Performance indicators. Results and conclusions. — *Appendices*: Constrained nonlinear test problems. Unconstrained nonlinear test problems. Special matrices. Structure of the implementation of the 2-phase algorithms. Structure of the implementation of the recursive quadratic programming algorithm.

A.J. J. TALMAN. — **Variable dimension fixed point algorithms and triangulations.** — With the collaboration of G. Van der Laan. — Mathematical Centre tracts, vol. 128. — Un vol. broché,  $16 \times 24$ , de iv, 172 p. — Prix: Dfl. 21.00. — Mathematisch Centrum, Amsterdam, 1980.

*Introduction and summary.* — *Preliminaries*: Triangulations and subdivisions. Brouwer's theorem and Sperner's lemma. Kakutani's theorem. Special triangulations of  $R^n$ . Triangulations of  $S^n$ . — *Extensions and applications of fixed point theorems*: Non-cooperative  $N$ -person game. Extensions to Kakutani's theorem. Constrained optimization. Nonlinear complementarity problem. — *Algorithms to find completely labelled simplices*: Labelling and accuracy. Kuhn's and Eaves's first algorithms. Merrill's algorithm. Van der Laan and Talman's basic algorithm. — *The efficiency of triangulations*: Fixed point triangulations of  $R^n$ . Crude measures. Average directional density. Measures based on minimizing the number of grid points. Comparison of several triangulations of  $R^n$ . A good triangulation of the affine hull of  $S^n$ . — *Variable dimension fixed point algorithm on the*

*product space  $S$  of unit simplices*: Triangulation of  $S$ . Integer labelling and approximation. The variable dimension algorithm on  $S$ . Vector labelling. Computational experience. — *Class of variable dimension fixed point algorithms on  $R^n$* : Triangulation of  $R^n$  for given positive integers summing up to  $n$ . Integer labelling and approximation. The variable dimension algorithm on  $R^n$ . Vector labelling. The two extreme cases  $N = 1$  and  $N = n$ . Computational experience. — *Geometric interpretations of the algorithms*: Interpretation with the set  $S$  on the zero-level. Two interpretations with  $M + N$  points. Modification for the algorithm on  $R^n$ .

Dieter GAIER. — **Vorlesungen über Approximation im Komplexen.** — Un vol. broché,  $17 \times 24$ , de 173 p. — Prix: FS 26.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1980.

APPROXIMATION DURCH REIHENENTWICKLUNG UND INTERPOLATION: *Darstellung komplexer Funktionen durch Orthogonalreihen und Faber-Reihen*: Der Hilbert-Raum  $L^2(G)$ . ON-Systeme, insbesondere von Polynomen, in  $L^2(G)$ . Vollständigkeit der Polynome in  $L^2(G)$ . Entwicklung nach ON-Systemen in  $L^2(G)$ . Die Bergmansche Kernfunktion. Über die Güte der Approximation; Faber-Entwicklungen. — *Approximation durch Interpolation*: Die Hermitesche Interpolationsformel. Interpolation in gleichverteilten Punkten; Fejer-Punkte, Fekete-Punkte. Approximation auf allgemeineren kompakten Mengen; der Satz von Runge. Interpolation im Einheitskreis. — ALLGEMEINE APPROXIMATIONS-SÄTZE IM KOMPLEXEN: *Approximation auf kompakten Mengen*: Der Approximationssatz von Runge. Der Satz von Mergelyan. Approximation durch rationale Funktionen. Das Fusion Lemma von Roth. — *Approximation auf abgeschlossenen Mengen*: Gleichmässige Approximation durch meromorphe Funktionen. Gleichmässige Approximation durch holomorphe Funktionen. Approximation mit Geschwindigkeit. Approximation mit gewisser Geschwindigkeit. Einige Anwendungen der Approximationsätze.

Klaus MAINZER. — **Geschichte der Geometrie.** — Un vol. broché,  $14 \times 21$ , de 232 p. — Prix: DM 32.00. — Bibliographisches Institut, Mannheim/Wien/Zürich, 1980.

*Einleitung: Bemerkungen über Wissenschaftsgeschichte.* — *Vorgriechische Geometrie*: Ägyptische Geometrie. Babylonische Geometrie. — *Griechische Geometrie*: Von den Sätzen des Thales zu Pythagoras. Konstruktionsprobleme der griechischen Geometrie. Die Euklidischen „Elemente“. Die weiterführenden Theorien. — *Indisch-Arabische Algebra und technische Geometrie der Neuzeit*: Trigonometrie und Algebra. Technische Geometrie. Neue Kurven in Astronomie und Physik. — *Geometrie des 17. und 18. Jahrhunderts*: Analytische Geometrie. Synthetische und darstellende Geometrie. Diskussion des Parallelenpostulats. Geometrie und Raumanschauung nach Kant. — *Geometrie des 19. Jahrhunderts*: Projektive Geometrie. Vektoralgebra und  $n$ -dimensionale Geometrie. Differentialgeometrie. Homogenität und Bewegungsgruppe. Topologie. Gruppentheorie und geometrische Invarianten nach F. Klein. — *Ausblicke auf die Geometrie des 20. Jahrhunderts*: Grundlagen der Geometrie. Entwicklungen und Anwendungen der Geometrie.

**Handbook of applicable mathematics.** — Vol. 2: Probability. — Chief editor: Walter Ledermann. Author: Emlyn Lloyd. — Un vol. relié,  $17,5 \times 25$  de xix, 450 p. — Prix: \$85.00. John Wiley and Sons, Chichester/New York/Brisbane/Toronto, 1980 (A Wiley-Interscience publication).

*Introduction.* — Introduction: probability and statistics. Basic concepts of probability. The calculus of probability. Random variables and their realizations: probability distributions. A first catalogue of discrete probability distributions (integer-valued variables).

Independent and non-independent random variables and their joint distributions, bivariate and multivariate; marginal and conditional distributions. The addition of random variables: convolution. Expectation (Expected value). Variance, covariance, and higher moments. Continuous distributions. A catalogue of continuous probability distributions. Generating functions. Multivariate continuous distributions. Miscellaneous topics on distributions. Order statistics. Miscellaneous topics involving conditional probability. Laws of large numbers. Stable distributions. Stochastic processes: introduction and examples. Processes in discrete time: Markov chains. Continuous-time processes. Renewals. Complements on stochastic processes: second order processes. — *Bibliography*. — *Index*.

Gopinath KALLIANPUR. — **Stochastic filtering theory**. — Applications of mathematics, vol. 13. — Un vol. relié, 16 × 24, de XVI, 316 p. — Prix: DM 59.50. — Springer-Verlag, New York/Heidelberg/Berlin, 1980.

Stochastic processes: basic concepts and definitions. — Martingales and the Wiener process. — Stochastic integrals. — The Ito formula. — Stochastic differential equations. — Functionals of a Wiener process. — Absolute continuity of measures and Radon-Nikodym derivatives. — The general filtering problem and the stochastic equation of the optimal filter (Part I). — Gaussian solutions of stochastic equations. — Linear filtering theory. — The stochastic equation of the optimal filter (Part II).

N. H. McCLAMROCH. — **State models of dynamic systems: a case study approach**. — Un vol. relié, 16 × 24, de VIII, 248 p. — Prix: DM 34.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1980.

*Modeling dynamic systems*: Modeling philosophy. Some physical principles. State models. Some systems concepts. Use of state models. — *First order linear state models*: Radioactive decay of cesium. Temperature in a building. An RC circuit. — *Second order linear state models*: Ingestion and metabolism of a drug. Mixing of a salt solution. DC motor. A bridged-T-filter. — *Higher order linear state models*: Reduction of limestone by heating. Vertical ascent of a deep sea diver. A speedometer mechanism. Automobile suspension system. Magnetic loudspeaker. — *First order nonlinear state models*: Management of a fisheries resource. Liquid level in a leaky tank. High temperature oven. Circuit with diode. — *Second order nonlinear state models*: Motion of a boat crossing a river. Spread of an epidemic. Tunnel-diode circuit. Underwater launch of a rocket. A study of blood sugar and insulin levels with application to diabetes. — *Higher order nonlinear state models*: Continuous flow stirred tank chemical reactor. A hot air balloon. Motion of a rocket near earth. Electrostatic microphone. — *Other differential state models*: Feedback control of the liquid level in a tank. Automatic regulation of temperature in a building. Sampled control of a field actuated motor. — *Discrete time and state models*: Occupancy in a hospital unit. An inventory model. Neuron model. Coin operated dispenser. A binary communications channel. Discrete population model. — *Appendix A*: Units, dimensions, and conversion factors. — *Appendix B*: Laplace transforms. — *Appendix C*: Routh-Hurwitz criteria. — *Appendix D*: Linear approximations. — *Appendix E*: Digital computer simulation and CSMP.

C. TRUESDELL. — **The tragicomical history of thermodynamics 1822-1854**. — Studies in the history of mathematics and physical sciences, vol. 4. — Un vol. relié, 16 × 24, de XII, 372 p. — Prix: DM 99.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1980.

The producer's apology to the spectators. — The common inheritance. — Prologue: LAPLACE, BIOT, and POISSON. — Act 1. Workless dissipation: FOURIER. — Act II. Dissi-

pationless work: CARNOT. — Distracting interlude: CLAPEYRON and DUHAMEL. — Act III. Equivalence, conservation, interconvertibility: when and of what? Act IV. Internal energy: the first paper of CLAUSIUS. Entropy: the first paper of RANKINE. — Distracting interlude: explosion of print. — Schismatic act V. Antiplot in a dark and empty theatre: REECH's discovery of a too general theory, and his failure to reduce it. — Orthodox act V. Clausius' second paper: absolute temperatures, irreversibility, and oracling.

Jean-Pierre SERRE. — **Trees.** — Translated from the French by John Stillwell. — Un vol. relié, 17 × 25, de IX, 142 p. — Prix: DM 48.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

TREES AND AMALGAMS: *Amalgams*: Direct limits. Structure of amalgams. Consequences of the structure theorem. Constructions using amalgams. Examples. — *Trees*: Graphs. Trees. Subtrees of a graph. — *Trees and free groups*: Trees of representatives. Graph of a free group. Free actions on a tree. Application: Schreier's theorem. Appendix: Presentation of a group of homeomorphisms. — *Trees and amalgams*: The case of two factors. Examples of trees associated with amalgams. Applications. Limit of a tree of groups. Amalgams and fundamental domains (general case). — *Structure of a group acting on a tree*: Fundamental group of a graph of groups. Reduced words. Universal covering relative to a graph of groups. Structure theorem. Application: Kurosh's theorem. — *Amalgams and fixed points*: The fixed point property for groups acting on trees. Consequences of property (FA). Examples. Fixed points of an automorphism of a tree. Groups with fixed points (auxiliary results). The case of  $SL_3(\mathbf{Z})$ . — *The tree of  $SL_2$  over a local field*: The tree. The groups  $GL(V)$  and  $SL(V)$ . Action of  $GL(V)$  on the tree of  $V$ ; stabilizers. Amalgams. Ihara's theorem. Nagao's theorem. Connection with Tits systems. — *Arithmetic subgroups of the groups  $GL_2$  and  $SL_2$  over a function field of one variable*: Interpretation of the vertices of  $\Gamma/X$  as classes of vector bundles of rank 2 over  $C$ . Bundles of rank 1 and decomposable bundles. Structure of  $\Gamma/X$ . Examples. Structure of  $\Gamma$ . Auxiliary results. Structure of  $\Gamma$ : case of a finite field. Homology. Euler-Poincaré characteristic.

François TREVES. — **Introduction to pseudodifferential and Fourier integral operators.** Vol. 1: Pseudodifferential operators. — The University series in mathematics. — Un vol. relié, 16 × 24, de xxvii, 299 p. — Prix: \$29.95. — Plenum Press, New York/London, 1980.

*Standard pseudodifferential operators*: Parametrices of elliptic equations. Definition and continuity of the "standard" pseudodifferential operators in an open subset of Euclidean space. Pseudodifferential operators are pseudolocal. Transposition, composition, transformation under diffeomorphisms of pseudodifferential operators. The symbolic calculus of pseudodifferential operators. Pseudodifferential operators on manifolds. Microlocalization and wave-front sets. Standard pseudodifferential operators acting on vector-valued distributions and on sections of vector bundles. — *Special topics and applications*: Compact pseudodifferential operators. Fredholm operators and the index of elliptic pseudodifferential operators on a compact manifold. Uniqueness in the Cauchy problem for certain operators with simple characteristics. The Friedrichs lemma. The theorem on "sums of squares". — *Application to boundary problems for elliptic equations*: The generalized heat equation and its parametrix. Preliminaries to the study of elliptic boundary problems: Sobolev spaces in bounded open subsets of

Euclidean spaces. Traces. Approximate triangulization of boundary problems for elliptic equations. Hypoelliptic boundary problems. Globally hypoelliptic boundary problems. Fredholm boundary problems. Coercive boundary problems. The oblique derivative problem. Boundary problems with simple real characteristics. Example of a boundary problem with double characteristics. — *Pseudodifferential operators of type  $(\rho, \delta)$* : Parametrix of hypoelliptic linear partial differential equations. Amplitudes and pseudodifferential operators of type  $(\rho, \delta)$ . The Calderon-Vaillancourt theorem and the Sharp Garding inequality. — *Analytic pseudodifferential operators*: Analyticity in the base and in the cotangent bundle. Pseudoanalytic and analytic amplitudes. Analytic pseudodifferential operators. Microlocalization all the way. The Holmgren theorem. Application to boundary problems for elliptic equations: analyticity up to the boundary.

François TREVES. — **Introduction to pseudodifferential and Fourier integral operators. Vol. 2: Fourier integral operators.** — The University series in mathematics. Un vol. relié, 16 × 24, xiv, pp. 301-649. — Prix: \$35.00. — Plenum Press, New York/London, 1980.

*Naive theory of Fourier integral operators*: Parametrix in the Cauchy problem for hyperbolic equations. Local definition of standard Fourier integral operators. An asymptotic expansion formula for pseudodifferential operators. Composition of Fourier integral operators with pseudodifferential operators. Effect of Fourier integral operators on wave-front sets. Application to microlocal Cauchy problems. — *Background on differential and symplectic geometry*: Rudiments of symplectic linear algebra. Basic differential geometry. Basic symplectic differential geometry. The Lagrangian Grassmannian. The Maslov index and the Keller-Maslov line bundle. — *Fourier distributions and global Fourier integral operators*: Phase functions locally associated with conic Lagrangian submanifolds of the cotangent bundle. The stationary phase formula. Fourier distributions associated with a Lagrangian submanifold of the cotangent bundle. The principal symbol of a Fourier distribution. Global Fourier integral operators. Their action on Fourier distributions. Composition. Fourier integral operators associated with a local canonical graph. Symbols, composition, continuity, similarities. Pseudodifferential operators of principal type with real principal symbol. The unitary group generated by a first-order self-adjoint pseudo-differential operator. — *Standard microlocal forms of pseudodifferential operators*: A preparation theorem for classical pseudodifferential operators. Complexes of pseudodifferential operators. Frobenius ideals of principal type with real principal symbol. Preparation theorem for Frobenius ideals with simple real characteristics. The Levi Matrix. Frobenius ideals with nonsingular Levi matrix. An example: the induced Cauchy-Riemann complex. — *Fourier integral operators with complex phase*: Approximate solutions of certain initial value problems. Flatness. Almost-analytic extensions. The stationary complex phase formula. Asymptotic expansion formula for pseudodifferential operators. Complex phases and positive almost-Lagrangian manifolds. Fourier distributions associated with complex phases. Fourier integral operators with complex phase. Composition. — *Applications of Fourier integral operators with complex phase*: Complex Eikonal and transport equations. Exponential of certain first-order pseudodifferential operators. Parametrix construction for certain pseudodifferential operators. A class of pseudodifferential operators whose characteristic manifold is symplectic. Subellipticity and uniqueness in the Cauchy problem. — *Applications to Riemannian manifolds*: Basic facts about the Laplace-Beltrami operator. Growth at infinity of the number of eigenvalues. Closed geodesics and Poisson formula. Sequences of eigenvalues and Maslov's quantization condition.

H. M. FARKAS, I. KRA. — **Riemann surfaces.** — Graduate texts in mathematics, vol. 71. — Un vol. relié,  $16 \times 24$ , de XI, 337 p. — Prix: DM 58.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1980.

*An overview*: Topological aspects, uniformization, and Fuchsian groups. Algebraic functions. Abelian varieties. More analytic aspects. — *Riemann surfaces*: Definitions and examples. Topology of Riemann surfaces. Differential forms. Integration formulae. — *Existence theorems*: Hilbert space theory: a quick review. Weyl's lemma. The Hilbert space of square integrable forms. Harmonic differentials. Meromorphic functions and differentials. — *Compact Riemann surfaces*: Intersection theory on compact surfaces. Harmonic and analytic differentials on compact surfaces. Bilinear relations. Divisors and the Riemann-Roch theorem. Applications of the Riemann-Roch theorem. Abel's theorem and the Jacobi inversion problem. Hyperelliptic Riemann surfaces. Special divisors on compact surfaces. Multivalued functions. Projective imbeddings. More on the Jacobian variety. — *Uniformization*: More on harmonic functions (a quick review). Subharmonic functions and Perron's method. A classification of Riemann surfaces. The uniformization theorem for simply connected surfaces. Uniformization of arbitrary Riemann surfaces. The exceptional Riemann surfaces. Two problems on moduli. Riemannian metrics. Discontinuous groups and branched coverings. Riemann-Roch: an alternate approach. Algebraic function fields in one variable. — *Automorphisms of compact surfaces: elementary theory*: Hurwitz's theorem. Representations of the automorphism group on spaces of differentials. Representations of  $\text{aut } M$  on  $H_1(M)$ . The exceptional Riemann surfaces. — *Theta functions*: The Riemann theta function. The theta functions associated with a Riemann surface. The theta divisor. — *Examples*: Hyperelliptic surfaces (one again). Relations among quadratic differentials. Examples of non-hyperelliptic surfaces. Branch points of hyperelliptic surfaces as holomorphic functions of the periods. Examples of Prym differentials.

JEULIN, Thierry. — **Semi-martingales et grossissement d'une filtration.** Lecture Notes in Mathematics, vol. 833. — Un vol. broché,  $16,5 \times 24,5$ , de IX, 142 p. — Prix: DM 21.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*Préliminaires*: Notations générales, semi-martingales. Espaces de semi-martingales. Semi-martingales et changement de probabilité. Quasi-martingales et théorème de Stricker. — *Résultats généraux sur l'hypothèse  $H'$* . — *Grossissement initial*: Adjonction d'une tribu atomique. Adjonction d'une tribu séparable: résultats individuels, recherche de décompositions canoniques, l'hypothèse  $H'$ : conditions nécessaires et/ou suffisantes. Exemples. — *Grossissement progressif*: Projection de fermés aléatoires. Calculs d'espérances conditionnelles. Comportement des semi-martingales. — *Grossissement à l'aide de variables honnêtes*: Variables honnêtes et fins d'optionnels: caractérisations, étude des nouvelles tribus prévisible et optionnelle, conditionnement par rapport à  $FL_+$ . L'hypothèse  $H'$  est vérifiée; formules de décomposition. Grossissements successifs. — *Applications*: Applications aux processus de Markov. Décomposition de Williams des trajectoires browniennes. Mouvement brownien et processus de Bessel d'ordre 3: un théorème de Pitman. Excursions du mouvement brownien.: quelques propriétés du pont brownien, excursions du brownien réel.

**Representation theory I.** — Proceedings of the Workshop on the present trends in representation theory, Ottawa, Carleton University, August 13-18, 1979. — Edited by

V. Dlab and P. Gabriel. — Lecture Notes in Mathematics, vol. 831. — Un vol. broché, 16,5 × 24,5, de xiv, 373 p. — Prix: DM 39.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*Peter Gabriel*: Auslander-Reiten sequences and representation-finite algebras. — *James E. Humphreys*: Highest weight modules for semisimple Lie algebras. — *Claus Michael Ringel*: Report on the Brauer-Thrall conjectures. — *Claus Michael Ringel*: Tame algebras. — *V.A. Rojter*: Matrix problems and representations of BOCS's. — *Bibliography 1969-1979*.

**Representation theory II.** — Proceedings of the Second international conference on representations of algebras, Ottawa, Carleton University, August 13-25, 1979. — Edited by V. Dlab and P. Gabriel. — Lecture Notes in Mathematics, vol. 832. — Un vol. broché, 16,5 × 24,5, de xiv, 673 p. — Prix: DM 68.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*M. Auslander and Idun Reiten*: Uniserial functors. — *M. Auslander and S. O. Smalø*: Preprojective modules: an introduction and some applications. — *R. Bautista*: Sections in Auslander-Reiten quivers. — *K. Bongartz*: Zykellose Algebren sind nicht zügellos. — *Sheila Brenner and M. C. R. Butler*: Generalizations of the Bernstein-Gelfand-Ponomarev reflection functors. — *H. Brune*: On finite representation type and a theorem of Kulikov. — *Charles W. Curtis*: Homology representations of finite groups. — *Everett C. Dade*: Algebraically rigid modules. — *Vlastimil Dlab and Claus Michael Ringel*: The preprojective algebra of a modulated graph. — *P. Dowbor, C. M. Ringel and D. Simson*: Hereditary artinian rings of finite representation type. — *Ju. A. Drozd*: Tame and wild matrix problems. — *Edward L. Green*: Remarks on projective resolutions — *Dieter Happel, Udo Preiser and Claus Michael Ringel*: Vinberg's characterization of Dynkin diagrams using subadditive functions with application to  $DTr$ -periodic modules. — *Yasuo Iwanaga and Takayoshi Wakamatsu*: Trivial extension of Artin algebras. — *C. U. Jensen and H. Lenzing*: Model theory and representations of algebras. — *Victor G. Kač*: Some remarks on representations of quivers and infinite root systems. — *Herbert Kupisch and Eberhard Scherzler*: Symetric algebras of finite representation type. — *Peter Landrock*: Some remarks on Loewy lengths of projective modules. — *Nikolaos Marmaridis*: Reflection functors. — *Roberto Martinez-Villa*: Algebras stably equivalent to  $l$ -hereditary. — *Frank Okoh*: Hereditary algebras that are not pure-hereditary. — *Wilhelm Plesken*: Projective lattices over group orders as amalgamations of irreducible lattices. — *Christine Riedtmann*: Representation-finite selfinjective algebras of class  $A_n$ . — *K. W. Roggenkamp*: Representation theory of blocks of defect 1. — *Eberhard Scherzler and Josef Waschbüsch*: A class of self-injective algebras of finite representation type. — *Daniel Simson*: Right pure semi-simple hereditary rings. — *Hiroyuki Tachikawa*: Representations of trivial extensions of hereditary algebras. — *Gordana Todorov*: Almost split sequences for  $TrD$ -periodic modules. — *Joseph Waschbüsch*: A class of self-injective algebras and their indecomposable modules. — *Kunio Yamagata*: Hereditary artinian rings of right local representation type.

**Model theory of algebra and arithmetic.** — Proceedings of the Conference on applications of logic to algebra and arithmetic held at Karpacz, Poland, September 1-7, 1979. — Edited by L. Pacholski, J. Wierzejewski, and A. J. Wilkie. — Lecture Notes in Mathematics vol. 834. — Un vol. broché, 16,5 × 24,5, de vi, 410 p. — Prix: DM 43.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*J. Becker, J. Denef and L. Lipshitz*: Further remarks on the elementary theory of formal power series rings. — *Chantal Berline*: Elimination of quantifiers for non semi-

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Heiner ZIESCHANG, Elmar VOGT, Hans-Dieter COLDEWEY. — **Surfaces and planar discontinuous groups.** — Revised and expanded translation, translated from the German by J. Stillwell. — Lecture Notes in Mathematics, vol. 835. — Un vol. broché, 16,5 × 24,5, de ix, 334 p. — Prix: DM 34.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*Free groups and graphs*: Free groups. Word and conjugacy problems. Graphs. The fundamental group of a graph. Coverings of graphs. The Reidemeister-Schreier method for subgroups. The Nielsen method. Geometric interpretation of the Nielsen property. Automorphisms of a free group of finite rank. — *2-dimensional complexes and combinatorial presentations of groups*: Tietze's theorem. The Reidemeister-Schreier method. Free products with amalgamation. 2-dimensional complexes. Coverings. Proof of the Kurosh theorem. Homology groups. The first homotopy group and the fundamental group, Seifert-Van Kampen theorem. Pasting complexes together. Grushko's theorem. On the Nielsen method in free products. On groups with one defining relation. — *Surfaces*: Definitions. Classification of finite surfaces. Kneser's formula. Coverings of surfaces. Types of simple closed curves on surfaces. Intersection numbers of curves. On continuous mappings between surfaces. — *Planar discontinuous groups*: Planar nets. Automorphisms of a planar net. Automorphism groups of planar nets. Fundamental domains. The algebraic structure of planar discontinuous groups. Classification of planar discontinuous groups. Existence proof. On the algebraic structure of planar groups. The word and conjugacy problems. Surface subgroups of finite index. On planar groups with non-compact fundamental domain. On decompositions of discontinuous groups of the plane. Planar group presentations and diagrams. Subgroups and the Riemann-Hurwitz formula. Finite groups acting on closed surfaces. On the rank of planar discontinuous groups. — *Automorphisms of planar groups*: Preliminary considerations. Binary products. Homotopic binary products. Free generators of the group of relations. The mapping matrix. The Dehn-Nielsen theorem. Nielsen's theorem for bounded surfaces. Automorphisms of planar groups. Combinatorial isotopy. A solution of the word and conjugacy problem in fundamental groups of surfaces. Isotopy of free homotopic simple closed curves. Basepoint preserving isotopies of simple closed curves. Inner automorphisms and iso-

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*Introduction*. — *Polynomial representations of  $GL_n(K)$ : the Schur algebra*: Notation, etc... The categories  $M_K(n)$ ,  $M_K(n, r)$ . The Schur algebra  $S_K(n, r)$ . The map  $e: K\Gamma \rightarrow S_K(n, r)$ . Modular theory. The module  $E^{\otimes r}$ . Contravariant duality.  $A_K(n, r)$  as  $K\Gamma$ -bimodule. — *Weights and characters*: Weights. Weight spaces. Characters. Some properties of weight spaces. Irreducible modules in  $M_K(n, r)$ . — *The modules  $D_{\lambda, K}$* : Preamble,  $\lambda$ -tableaux. Bideterminants. Definition of  $D_{\lambda, K}$ .

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N. V. KRYLOV. — **Controlled diffusion processes.** — Translated by A. B. Aries. — Applications of mathematics, vol. 14. — Un vol. relié, 16,5 × 24,5, de xii, 308 p. — Prix: DM 79.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1980.

*Introduction to the theory of controlled diffusion processes*: The statement of problems, Bellman's principle, Bellman's equation. Examples of the Bellman equations, the normed Bellman equation. Application of optimal control theory, techniques for obtaining some estimates. One dimensional controlled processes. Optimal stopping of a one-dimensional controlled process. — *Auxiliary propositions*: Notation and definitions. Estimates of the distribution of a stochastic integral in a bounded region. Estimates of the distribution of a stochastic integral in the whole space. Limit behavior of some functions. Solutions of stochastic integral equations and estimates of the moments. Existence of a solution of a stochastic equation with measurable coefficients. Some properties of a random process depending on a parameter. The dependence of solutions of a stochastic equation on a parameter. The Markov property of solutions of stochastic equations. Ito's formula with generalized derivatives. — *General properties of a payoff function*: Basic results. Some preliminary considerations. The proof of theorems. The proof of theorems for the optimal stopping problem. — *The Bellman equation*: Estimation of first derivatives of payoff functions. Estimation from below of second derivatives of a payoff function. Estimation from above of second derivatives of a payoff function. Estimation of a derivative of a payoff function with respect to  $t$ . Passage to the limit in the Bellman equation. The approximation of degenerate controlled processes by nondegenerate ones. The Bellman equation. — *The construction of  $\varepsilon$ -optimal strategies*:  $\varepsilon$ -optimal Markov strategies and the Bellman equation.  $\varepsilon$ -optimal Markov strategies. The Bellman equation in the presence of degeneracy. The payoff function and solution of the Bellman equation: the uniqueness of the solution of the Bellman equation. — *Controlled processes with unbounded coefficients*: *The normed Bellman equation*: Generalizations of the results obtained. General methods for estimating derivatives of payoff functions. The normed Bellman equation. The optimal stopping of a controlled process on an infinite interval of time. Control on an infinite interval of time. — *Appendices*: Some properties of stochastic integrals. Some properties of submartingales.

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Walter RUDIN. — **Function theory in the unit ball of  $\mathbb{C}^n$ .** — Grundlehren der mathematischen Wissenschaften, vol. 241. — Un vol. relié,  $16,5 \times 24$ , de XIII, 436 p. — Prix: DM 79.50. — Springer-Verlag, New York/Heidelberg/Berlin, 1980.

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**A compendium of continuous lattices.** — By G. Gierz, K. H. Hofmann, K. Keimel, J. D. Lawson, M. Mislove, D. S. Scott. — Un vol. relié,  $17 \times 25$ , de xx, 371 p. — Prix: DM 38.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*Introduction, background and plan of the work.* — *A primer of complete lattices*: Generalities and notation. Complete lattices. Galois connections. Meet-continuous lattices. — *Lattice theory of continuous lattices*: The “way-below” relation. The equational characterization. Irreducible elements. Algebraic lattices. — *Topology of continuous lattices: the Scott topology*: The Scott topology. Scott continuous functions. Injective spaces. Function spaces. — *Topology of continuous lattices: the Lawson topology*: The Lawson topology. Meet-continuous lattices revisited. Lim-inf convergence. Bases and weights. — *Morphisms and functors*: Duality theory. Morphisms into chains. Projective limits and functors which preserve them. Fixed point construction for functors. — *Spectral theory of continuous lattices*: The lemma. Order generation and topological generation. Weak irreducibles and weakly prime elements. Sober spaces and complete lattices. Duality for continuous Heyting algebras. — *Compact posets and semilattices*: Pospaces and topological semilattices. Compact topological semilattices. The fundamental theorem of compact semilattices. Some important examples. Chains in compact pospaces and semilattices. — *Topological algebra and lattice theory: applications* One-sided topological semilattices. Topological lattices. Compact pospaces and continuous Heyting algebras. Lattices with continuous Scott topology.

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Preliminaries. — The theory of adjoint systems. — Castelnuovo's theorems. — On curves which are the schemes of zeros of a section of a rank two-vector bundle. — An application to complete intersections.

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R. E. EDWARDS. — **A formal background to mathematics, vol. II: a critical approach to elementary analysis.** — Universitext. — Deux vol. brochés, de XLVII, 1-606 p., et VI, 607-1170 p. — Prix: DM 72.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1980.

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Nicholas WOODHOUSE. — **Geometric quantization.** — Oxford mathematical monographs. — Un vol. relié,  $16,5 \times 24$ , de XI, 316 p. — Prix: £27.50. — Clarendon press: Oxford University Press, Oxford, 1980.

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izations: local and global geometry. Polynomial observables. Generating functions for real polarizations. The Hamilton-Jacobi equation. Complex Lagrangian subspaces. Complex polarizations. Separation of the Hamilton-Jacobi equation. Construction of polarizations. — *Quantization*: The quantum condition. Prequantization. The integrality condition. Quantizable phase spaces. Examples. Finite transformations. Quantization. Pairing. Densities. Half-density quantization. Examples. — *The metaplectic correction*: The corrected quantization. Half-forms. Applications. Cohomological wave functions. — *Spinors and relativistic systems*: Spin. Spinor algebra. Spin structures. Relativistic wave equations. Elementary relativistic systems. Relativistic quantization. Massless particles. Spin and gravity. Symplectic field theory. Quantum field theory. — *Appendix*: Notation and definitions. Useful formulae. Vector bundles and line bundles. Cohomology.

**Konstruktive Methoden der finiten nichtlinearen Optimierung.** — Tagung, Oberwolfach, 27. Januar-2. Februar 1980. — Herausgegeben von L. Collatz, G. Meinardus und W. Wetterling. — International series of numerical mathematics, vol. 55. — Un vol. relié, 17 × 24,5, de 211 p. — Prix: FS 50.00. — Birkhäuser, Basel/Boston/Stuttgart, 1980.

*Cl. Benzaken, P. L. Hammer, B. Simeone*: Some remarks on conflict graphs of quadratic pseudo-Boolean functions. — *D. Böhning*: Numerische Verfahren in der optimalen Versuchsplanung: ein allgemeiner Schrittweiten- und ein Cluster-algorithmus. — *L. J. Cromme*: Sind Fixpunktverfahren effektiv? — *U. Eckhardt*: Some remarks on Hacijan's paper. — *G. Fender, K. Nixdorff, J. Pesselhoy*: Zwei Anwendungen der nichtlinearen Optimierung in der Schallortung. — *R. Hettich, P. Zencke*: Superlinear konvergente Verfahren für semi-infinite Optimierungsprobleme im stark eindeutigen Fall. — *H. Th. Jongen, P. Jonker, F. Twilt*: Some reflections on the continuous Newton-method. — *H. Th. Jongen*: Optimalitätskriterien und lokale Stetigkeit des Tschebyscheff-Operators. — *K. Kubik*: A note on the solution of inverse problems. — *F. A. Lootsma*: Ranking of non-linear optimization codes according to efficiency and robustness. — *C. P. Ortlieb*: Optimale periodische Steuerung diskreter Prozesse. — *G. A. Watson*: An algorithm for a class of nonlinearly constrained nondifferentiable optimization problems.

R. Z. HAS'MINSKII. — **Stochastic stability of differential — equations.** Translated by D. Louvish. — Edited by S. Swierczkowski. — Monographs and textbooks on mechanics of solids and fluids: mechanics, analysis, vol. 7. — Un vol. relié, 15 × 23, de xvi, 344 p. — Prix: Dfl. 100.00. — Sijthoff & Noordhoff, Alphen aan den Rijn/Rockville, Maryland, 1980.

*Boundedness in probability and stability of stochastic processes defined by differential equations*: Brief review of prerequisites from probability theory. Dissipative systems of differential equations. Stochastic processes as solutions of differential equations. Boundedness in probability of stochastic processes defined by systems of differential equations. Stability. Stability of randomly perturbed deterministic systems. Estimation of a certain functional of a Gaussian process. Linear systems. — *Stationary and periodic solutions of differential equations*: Stationary and periodic stochastic processes. Convergence of stochastic processes. Existence conditions for stationary and periodic solutions. Special existence conditions for stationary and periodic solutions. Conditions for convergence to a periodic solution. — *Markov processes and stochastic differential equations*: Definition of Markov processes. Stationary and periodic Markov processes. Stochastic differential equations. Conditions for regularity of the solution. Stationary and periodic solutions of stochastic differential equations. Stochastic equations and partial differential equations. Conditions for recurrence and finiteness of mean recurrence time. Further conditions for

recurrence and finiteness of mean recurrence time. — *Ergodic properties of solutions of stochastic equations*: Kolmogorov classification of Markov chains with countably many states. Recurrence and transience. Positive and null processes. Existence of a stationary distribution. Strong law of large numbers. Some auxiliary results. Existence of the limit of the transition function. Some generalizations. Stabilization of the solution of the Cauchy problem for a parabolic equation. Limit relations for null processes. — *Stability of systems of stochastic equations*: Statement of the problem. Some auxiliary results. Stability in probability. Asymptotic stability in probability and instability. Examples. Differentiability of solutions of stochastic equations with respect to the initial conditions. Exponential  $p$ -stability and  $q$ -stability. — *Systems of linear stochastic equations*: One-dimensional systems. Equations for moments. Exponential  $p$ -stability and  $q$ -instability. Uniform stability in the large. Stability of products of independent matrices. Asymptotic stability of linear systems with constant coefficients. Systems with constant coefficients. Two examples.  $n$ -th order equations. Stochastic stability in the strong and weak senses. — *Some problems in the theory of stability of stochastic systems*: Stability in the first approximation. Instability in the first approximation. Two examples. Stability under damped random perturbations. Application to stochastic approximation. Stochastic approximations when the regression equation has several roots. Some generalizations. — *Stabilization of controlled stochastic systems*: Preliminary remarks. Bellman's principle. Linear systems. Method of successive approximations. The case of  $n$ -th order equation. — *Appendix to the English edition*: Moment stability and almost sure stability for linear systems of equations whose coefficients are Markov processes. Almost sure stability of the paths of one-dimensional diffusion processes. Reduction principle. Some further results.

**Théorie ergodique.** — Séminaire de théorie ergodique, Les Plans-sur-Bex, 23-29 mars 1980. — Organisé par S. D. Chaterjii et P. de la Harpe. — Monographie de l'Enseignement Mathématique, vol. 29. — Un vol. broché,  $16 \times 24$ , de 112 p. — Prix: FS 34.00. — L'Enseignement Mathématique, Université de Genève, Genève, 1981.

*P. Arnoux*: Echanges d'intervalles et flots sur les surfaces. — *P.-L. Aubert*: Deux actions de  $SL(2, \mathbb{Z})$ . — *P. de la Harpe et K. Jhabvala*: Quelques propriétés des algèbres d'un groupe discontinu d'isométries hyperboliques. — *M. Misiurewicz*: The result of Rafał Kołodziej. — *M. Misiurewicz*: Topological entropy and metric entropy. — *C. Series*: On coding geodesics with continued fractions. — *B. Weiss*: Orbit equivalence of non-singular actions.

**Finite simple groups II.** — Proceedings of a London mathematical society research symposium in finite simple groups held at the University of Durham in July-August 1978. — Edited by Michael J. Collins. — Un vol. relié,  $16 \times 23,5$ , de xv, 345 p. — Prix: £25.00. — Academic Press, London/New York/Toronto/Sydney/San Francisco, 1980.

FINITE SIMPLE GROUPS AND THEIR CLASSIFICATION: *Michael J. Collins*: Introduction: a survey of the classification project. — *Gary M. Seitz*: Standard subgroups in finite groups. — *Ronald Solomon*: The  $B(G)$ -conjecture and unbalanced groups. — *Daniel Gorenstein and Richard Lyons*: Finite groups of characteristic 2 type. — *Michael Aschbacher*: The uniqueness case for groups of characteristic 2 type. — *Franz Timmesfeld*: Groups of  $GF(2)$ -type and related problems. — *Geoffrey Mason*: Quasithin groups. — *Robert L. Griess, Jr.*: Odd standard form problems. — *George Glauberman*: The revision project and pushing-up. — *David M. Goldschmidt*: Pushing-up in finite groups. — REPRESENTATION THEORY OF GROUPS OF LIE TYPE: *R. W. Carter*: Complex representation

theory of finite groups of Lie type. — *J. E. Humphreys*: Modular representations of finite groups of Lie type. — *Jens C. Jantzen*: Weyl modules for groups of Lie type. — GEOMETRY AND THE SPORADIC GROUPS: *J. Tits*: Four presentations of Leech's lattice. — *J. Tits*: Buildings and Buekenhout geometries. — *John G. Thompson*: Fixed point free involutions and finite projective planes. — *Charles C. Sims*: How to construct a baby monster.

Erich MÜLLER-PFEIFFER. — **Spectral theory of ordinary differential operators.** — Translation editor: M. S. P. Eastham. — Ellis Horwood series in mathematics and its applications. — Un vol. relié, 16 × 23,5, de 246 p. — Prix: £16.50. — Ellis Horwood limited, Chichester and John Wiley + Sons (Halsted press: a division of John Wiley + Sons), New York/Chichester/Brisbane/Toronto, 1981.

*Fundamental concepts*: Operators in Hilbert space. Spectral theorem and spectrum. Sesquilinear forms. Courant's variational principle. Decomposition of operators. Deficiency indices. — *The essential spectrum*: The adjoint operator. Differential operators with constant coefficients: self-adjoint and essentially self-adjoint operators. Invariance of the essential spectrum under perturbations. Localization of the essential spectrum. Relatively compact perturbations. Existence of isolated Eigenvalues. The Euler differential operator. — *Discrete spectra*: Sufficient conditions. Necessary and sufficient conditions. Second-order differential operators. The infimum of the spectrum of periodic differential operators. — *Continuous spectra*: Self-adjoint operators and boundary conditions. Non-existence of Eigenvalues. The Friedrichs extension. — *Sturm-Liouville operators*: Oscillation and the spectrum. Non-existence of Eigenvalues. Special cases. — *Oscillation criteria*: Kneser-type conditions. Special cases. Integral conditions. Special cases. The Sturm-Liouville equation.

**Analysis and optimisation of stochastic systems.** — Based on the proceedings of the international conference on analysis and optimisation of stochastic systems held at the university of Oxford from 6-8 september, 1978 organised by the Institute of mathematics and its applications. — Edited by O. L. R. Jacobs, M. H. A. Davis, M. A. H. Dempster, C. J. Harris and P. C. Parks. — The Institute of mathematics and its applications conference series. — Un vol. relié, 15,5 × 23,5, de xiv, 573 p. — Prix: US\$46.00. — Academic Press, London/New York/Toronto/Sydney/San Francisco, 1980.

OPTIMAL STOCHASTIC CONTROL: Benes, V. E., Shepp, L. A. and Witsenhausen, H. S.: "Some solvable stochastic control problems". — Elliott, R. J. and Varaiya, P. P.: "A sufficient condition for the optimal control of a partially observed stochastic system." — Davis, M. H. A. and Wan, C. B.: "The principle of optimality for Markov jump processes". — Vermes, D.: "Extremality properties of the optimal strategy in Markovian control problems". — Bismut, J.-M.: "Duality methods in the control of semi-martingales". — Boel, R. and Kohlmann, K.: "Stochastic optimal control over double martingales". — STOCHASTIC OPTIMISATION: Bensoussan, A. and Lions, J. L.: "Optimal stopping-time problems for reflected diffusion processes". — Nisio, M.: "On the optimal stopping semi-group for controlled Markov processes". — Pursiheimo, U. and Ruohonen, M.: "On the optimal search for a target whose motion is a diffusion process". — Sutherland, W. R. S.: "Equivalent Markovian decision problems" — STOCHASTIC PROCESSES: Fleming, W. H.: "Exit probabilities for diffusions depending on small parameters". — Virani, N. A. A. and Sargent, R. W. H.: "A new approach to the theory of nonlinear stochastic systems". — Root, W. L.: "Generic models for stochastic systems". — Curtain, R. F.: "Mathe-

mathematical models for random vibration problems". — Ansell, J., Bendell, A. and Humble, S.: "Optimisation within nested renewal processes". — Ichikawa, A.: "Stability and control of stochastic evolution equations". — ALGORITHMS: Haussmann, U. G.: "A discrete approximation to optimal stochastic controls". — Dixon, L. W. C. and James, L.: "On stochastic variable-metric methods". — Gawthrop, P. J.: "On the stability and convergence of self-tuning controllers". — INFORMATION: Witsenhausen, H. S.: "Informational aspects of stochastic control". — Willems, J. C.: "Some remarks on the concept of information state". — STATE ESTIMATION: Brockett, R. W. and Clark, J. M. C.: "The geometry of the conditional density equation". — Grimble, M. J.: "Finite-time linear filtering, prediction and control". — Smith, A. F. M. and Makov, U. E.: «Bayesian detection and estimation of jumps in linear systems». — Pavon, M. and Wets, R. J. B.: "A stochastic variational approach to the duality between estimation and control: discrete-time". — Balakrishnan, A.V.: "Non-linear filtering: white noise model". — Halme, A.: "Some new algorithms for nonlinear state estimation and filtering". — Marcus, S. I., Mitter, S. K. and Ocone, D.: "Finite-dimensional nonlinear estimation for a class of systems in continuous and discrete time". — PARAMETER ESTIMATION: Ljung, L.: "Some basic ideas in recursive identification". — de Larminat, Ph. and Doncarli, C.: "A comparative study between extended least squares and extended Kalman filter in linear system identification". — Bagchi, A.: "Consistent estimates of parameters in continuous-time systems". — Rissanen, J.: "Consistent order-estimates of autoregressive processes by shortest description of data". — Zarrop, M. B.: "Sequential generation of optimal test-signals for parameter estimation in dynamic systems". — Bittanti, S.: "Periodic mean-value processes: estimation-oriented information analysis". — Goodrich, R. L. and Caines, P. E.: "Identification of time-invariant linear systems from non-stationary cross-sectional data". — APPLICATIONS: Carmichael, N. and Pritchard, A. J.: "Optimal scheduling for the treatment of cancer". — Uchida, Y.: "The control test and its application to the choice and the evaluation of alternative stochastic economic systems". — Tunnicliffe Wilson, G. and Overton, R. S.: "Nuclear reactor operation". — Haslett, J.: "Problems in the stochastic storage of solar thermal energy".

**Stochastic programming.** — Based on the proceedings of an international conference sponsored by the Institute of mathematics and its applications, Mathematical institute, Oxford, 15-17 July, 1974. — Ed. by M. A. H. Dempster. — The Institute of mathematics and its applications conference series. — Un vol. relié, 15 × 23, de XIII, 573 p. — Prix: US\$97.00. — Academic Press, London/New York/Toronto/Sydney/San Francisco, 1980.

INTRODUCTION: Dempster, M. A. H.: Introduction to stochastic programming. — THEORY: Prekopa, A.: Logarithmic concave measures and related topics. — Gartska, S. J.: The economic equivalence of several stochastic programming models. — Kall, P. and Oettli, W.: Measurability theorems for stochastic extremals. — Grinold, R. C.: A class of constrained linear control problems with stochastic coefficients. — Hartley, R.: Inequalities for a class of sequential stochastic decision processes. — Jacobs, O. L. R.: The structure of stochastic control laws. — Wets, R. J. B.: Stochastic multipliers, induced feasibility and non-anticipativity in stochastic programming. — Eisner, M. J. and Olsen, P.: Duality in probabilistic programming. — Marti, K.: "Approximations to stochastic optimization problems. — COMPUTATION: Bereanu, B.: Some numerical methods in stochastic linear programming under risk and uncertainty. — Foote, B. L.: A discussion of the properties of a basic simplex algorithm for generating the decision regions of Bereanu. — Dempster, M. A. H. and Papagaki-Papoulias, A.: Computational experience with an approximate method for the distribution problem. — Wets, R. J. B.: The distri-

bution problem and its relation to other problems in stochastic programming. — Strazicky, B.: Some results concerning an algorithm for the discrete recourse problem. — Ermoljev, Y. M. and Nurminskiy, E. A.: Stochastic quasigradient algorithms for minimax problems in stochastic programming. — Mockus, J.: On Bayesian methods for seeking the extremal point. — Armstrong, R. D. and Balintfy, J. L.: A chance constrained multiple choice programming algorithm with applications. — APPLICATIONS: Loucks, D. P.: Discrete chance constrained models for river basin planning. — ReVelle, C. and Gundelach, J.: A variance minimizing linear decision rule for reservoir management and design. — Lane, M. N. and Littlechild, S. C.: A stochastic programming approach to weather-dependent pricing for water resources. — Prekopa, A., Ganczer, S., Deak, I. and Patyi, K.: The STABIL stochastic programming model and its experimental application to the electrical energy sector of the Hungarian economy. — Beale, E. M. L., Forrest, J. J. H. and Taylor, C. J.: Multi-time-period stochastic programming. — Oral, M. and Rao, S. Subba: An objective function for inventory control models. — Lockett, A. G., Muhlemann, A. P. and Wolsey, L. A.: A stochastic programming model for project selection. — Bradley, S. P. and Crane, D. B.: Managing a bank bond portfolio over time. — Lane, M. and Hutchinson, P.: A model for managing a certificate of deposit portfolio under uncertainty. — Van Moeseke, P.: Stochastic portfolio programming: the game solution. — Dexter, A. S., Yu, J. N. W. and Ziemba, W. T.: Portfolio selection in a lognormal market when the investor has a power utility function: computational results. — Sengupta, J. K.: Stochastic programming: a selective survey of recent economic applications. — Mirman, L. J.: One sector economic growth and uncertainty: a survey.

CHAE, Soo Bong. — **Lebesgue integration.** — Monographs and textbooks in pure and applied mathematics vol. 58. — Un vol. relié, 15,5 × 23,5, de x, 314 p. — Prix: FS 75.00. — Marcel Dekker, New York/Basel, 1980.

PRELIMINARIES: Sets. Relations. Countable sets. Real numbers. Topological concepts in  $\mathbf{R}$ . Continuous functions. Metric spaces. — THE RIEMANN INTEGRAL: The Cauchy integral. Fourier series and Dirichlet's conditions. The Riemann integral. Sets of measure zero. Existence of the Riemann integral. Deficiencies of the Riemann integral. — THE LEBESGUE INTEGRAL: RIESZ METHOD: Step functions and their integrals. Two fundamental lemmas. The class  $L^+$ . The Lebesgue integral. The Beppo Levi theorem — monotone convergence theorem. The Lebesgue theorem — dominated convergence theorem. The space  $L^1$ . Appendix: Henri Lebesgue. Frigyes Riesz. — LEBESGUE MEASURE: Measurable functions. Lebesgue measure.  $\sigma$ -algebras and Borel sets. Nonmeasurable sets. Structure of measurable sets. More about measurable functions. Egoroff's theorem. Steinhaus' theorem. The Cauchy functional equation. Lebesgue outer and inner measures. — GENERALIZATIONS: The integral on measurable sets. The integral on infinite intervals. Lebesgue measure on  $\mathbf{R}$ . Finite additive measure: the Banach measure problem. The double Lebesgue integral and the Fubini theorem. The complex integral. — DIFFERENTIATION AND THE FUNDAMENTAL THEOREM OF CALCULUS: Nowhere differentiable functions. The Dini derivatives. The rising sun lemma and differentiability of monotone functions. Functions of bounded variation. Absolute continuity. The fundamental theorem of calculus. — THE  $L^p$  SPACES AND THE RIESZ-FISCHER THEOREM: The  $L^p$  spaces ( $1 \leq p < \infty$ ). Approximations by continuous functions. The space  $L^\infty$ . The  $l^p$  spaces ( $1 \leq p \leq \infty$ ). Hilbert spaces. The Riesz-Fischer theorem. Orthonormalization. Completeness of the trigonometric system. Remarks on Fourier series. — APPENDIX: The development of the notion of the integral, by Henri Lebesgue.

Jacques CHAZARAIN, Alain PIRIOU. — **Introduction à la théorie des équations aux dérivées partielles linéaires.** — Collection « MB ». — Un vol. broché, 15,5 × 24,5 de 466 p. — Ouvrage publié avec le concours du C.N.R.S. — Gauthier-Villars, Paris, 1981.

DISTRIBUTIONS ET OPÉRATEURS: Espaces de distributions. Convolution et transformée de Fourier des distributions. Spectre singulier d'une distribution. Opérateurs et noyaux. Opérateurs et propriétés de support. Opérateurs différentiels à coefficients constants. Opérateurs et distributions sur une variété. Opérateurs et noyaux distributions sur une variété. Ouverts réguliers de  $\mathbf{R}^n$  et variétés à bord. Compléments. — ESPACES DE SOBOLEV ET APPLICATIONS: Principe de Dirichlet. Les espaces  $H^s(X)$  et  $H_{loc}^s(X)$ . Les espaces  $H^s(\bar{X})$  et  $H_{loc}^s(\bar{X})$ . Théorèmes de traces, espaces  $H_0^s(X)$ . Application au problème de Dirichlet. Espaces de Sobolev et régularisation. Compléments. — SYMBOLES, INTÉGRALES OSCILLANTES ET THÉORÈMES DE LA PHASE STATIONNAIRE: Introduction. Les symboles. Symboles elliptiques. Développement asymptotique de symboles. Topologie sur les espaces de symboles. Généralisations diverses. Intégrales oscillantes. Opérateurs intégraux associés à une phase et une amplitude. Théorème de la phase stationnaire. Compléments. — OPÉRATEURS PSEUDO-DIFFÉRENTIELS: Définition. Une caractérisation des O.P.D. Symbole d'un opérateur pseudo-différentiel. Algèbre et calcul symbolique des O.P.D. O.P.D. sur les variétés. Calcul symbolique des O.P.D. sur une variété. Opérateurs pseudo-différentiels elliptiques. O.P.D. et espaces de Sobolev. Complexes elliptiques et théorie de Hodge. Lemme de Friedrich et régularisations. Compléments. — PROBLÈMES AUX LIMITES ELLIPTIQUES: Introduction. Régularité au bord des potentiels. Le projecteur de Calderon. Application aux problèmes aux limites elliptiques. Exemples. Compléments. — EQUATIONS D'ÉVOLUTION: Théorèmes de Cauchy-Kovaleski et Holmgren. Condition nécessaire pour que le problème de Cauchy soit bien posé. Opérateurs hyperboliques à coefficients constants. Problèmes de Cauchy hyperboliques à coefficients variables. Problèmes de Cauchy paraboliques. Semi-groupes d'opérateurs et applications. Compléments. — PROBLÈMES MIXTES HYPERBOLIQUES: Introduction. Espaces et opérateurs utilisés. La condition de Lopatinski uniforme. Inégalités d'énergie. Construction du symétriseur. Résolution du problème sans conditions initiales. Résolution du problème mixte. Vitesse finie de propagation. Compléments. — MICROLOCALISATION: Propriétés générales du spectre singulier ( $WF$ ). Les théorèmes fondamentaux. Le cas des variétés. Le cas des opérateurs pseudo-différentiels. Compléments.

**Combinatorics, representation theory and statistical methods in groups: Young day proceedings.** — Edited by T.V. Narayana, R. M. Mathsen and J. G. Williams. — Lecture notes in pure and applied mathematics, vol. 57. — Un vol. broché, 18 × 25,5, de 170 p. — Prix: FS 52.00. — Marcel Dekker, New York/Basel, 1980.

*Invited papers:* G. de B. Robinson: Alfred Young as I knew him. — G. D. James: The decomposition matrices of  $G_n$ : the present state of play. — P. Doubilet, J. Fox and G.-C. Rota: The elementary theory of the symmetric group. — G. Kreweras: Description de certaines forêts par des couples de suites de Young en dualité. — G. E. Andrews: Macdonald's conjecture and descending plane partitions. — G. P. Steck: Lattice paths and accelerated life testing. — J. S. Frame: Generalized hook graphs and degree formulas for  $O_n(2)$ . — R. P. Stanley: Unimodal sequences arising from Lie algebras. — A. Kerber: On certain connections between the representation theory of the symmetric group and the representation theory of an arbitrary finite group. — *Contributed papers:* T. V. Narayana: A note on randomisation. — R. Liebler: On codes in the natural representations of the symmetric group.

Willard L. MIRANKER. — **Numerical methods for stiff equations, and singular perturbation problems.** — Mathematics and its applications, vol. 5. — Un vol. relié, 15,5 × 23, de XIII, 202 p. — Prix: Dfl. 58.00. — D. Reidel Publishing Company, Dordrecht/Boston/London, 1981.

*Introduction*: Stiffness and singular perturbations. Review of the classical linear multistep theory. — *Methods of absolute stability*: Stiff systems and  $A$ -stability. Notions of diminished absolute stability. Solution of the associated equations. — *Nonlinear methods*: Interpolatory methods. Runge-Kutta methods and Rosenbrock methods. — *Exponential fitting*: Exponential fitting for linear multistep methods. Fitting in the matricial case. Exponential fitting in the oscillatory case. Fitting in the case of partial differential equations. — *Methods of boundary layer type*: The boundary layer numerical method. The  $\varepsilon$ -independent method. The extrapolation method. — *The highly oscillatory problem*: A two-time method for the oscillatory problem. Algebraic methods for the averaging process. Accelerated computation of averages and an extrapolation method. A method of averaging. — *Other singularly perturbed problems*: Singularly perturbed recurrences. Singularly perturbed boundary value problems.

**Colloquium numerical solution of partial differential equations.** — Edited by J. G. Verwer. — MC syllabus, vol. 44. — Un vol. broché, 16 × 24, de iv, 194 p. — Prix: Dfl. 24.00. — Mathematisch Centrum, Amsterdam, 1980.

*O. Axelsson*: Computational aspects in the numerical solution of parabolic problems by finite element methods. — *C. Cuvelier*: Survey of some methods for solving free boundary problems governed by partial differential equations. — *I. Gustafsson*: On modified incomplete factorization. — *P. W. Hemker*: Introduction to multigrid methods. Bibliography. — *P. J. van der Houwen*: Multistep splitting methods for non-linear initial value problems. *P. J. van der Houwen*: On the treatment of time-dependent boundary conditions in splitting methods for parabolic differential equations. — *R.M.M. Mattheij*: On the stability of a class of difference methods for boundary value problems of the heat equation with time dependent coefficients. — *N. Praagman*: A comparison of discretization methods that are used to solve the shallow water equations. — *A. Segal*: Discretization of the continuity equation for the solutions of the Navier-Stokes equations using the finite element method. — *A. Segal*: On upwind discretizations of the convection diffusion equation. — *J. G. Verwer*: On the iterated defect correction and the *LOD*-method for parabolic equations. — *J. G. Verwer*: A class of stabilized Runge-Kutta methods for semi-discrete parabolic equations.

G. VAN DER LAAN. — **Simplicial fixed point algorithms.** — With the collaboration of A.J.J. Talman. — Mathematical centre tracts, vol. 129. — Un vol. broché, 16 × 24, de iv, 172 p. — Prix: Dfl. 21.00. — Mathematisch Centrum, Amsterdam, 1980.

*Introduction.* — *Preliminaries*: Brouwer's theorem. Technique of triangulation. Sperner's lemma. Kakutani's theorem. Applications. — *Triangulations and measures of efficiency*: Basic triangulations of  $R^n$ . Measures for the efficiency of triangulations. Triangulations of  $S^n$  and  $T^n$ . Replacement step. — *Algorithms for approximating fixed points*: Integer labelling and approximation. Scarf's algorithm. Kuhn's algorithms. Algorithms to compute fixed points on  $R_+^n$ . Sandwich method. Homotopy algorithm. Vector labelling and approximation. A basic algorithm to compute a fixed point of a mapping. Sandwich and homotopy methods on  $R^n$ . Mappings from  $S^n$  into  $S^n$ . Concluding remarks. — *Variable dimension restart algorithm*: Description of the steps of the algorithm. Geometric interpretation. Convergence of the algorithm. Interpretation of the algorithm

in  $S^n \times [0,1]$ . Vector labelling. Convergence conditions for mappings on  $T^n$ . Computational results. — *Variable dimension restart algorithm on  $R^n$* : The unit cube. Convergence conditions on  $R^n$ . Recent developments. Computational results. — *The orientation of simplices*: Orientation. The variable dimension restart algorithm. A search to an odd number of completely labelled simplices. — *A continuous deformation algorithm with arbitrary refinement factors*: Triangulation of  $S^n \times [1, \infty)$ . The algorithm. The replacement steps. The application on  $R^n$ . Some remarks and numerical results.

C. GILORMINI. — **Mathématiques: concours ENSI (années 1975 à 1980)**. — Annales grandes écoles scientifiques, thématiques, sélectionnées et corrigées. — Un vol. broché,  $15 \times 22$ , de 172 p. — Masson, Paris/New York/Barcelone/Milan, 1981.

Continuité et dérivabilité. Intégrales et applications. Suites et séries. Courbes. Equations différentielles. Algèbre linéaire et multilinéaire. Problèmes: option *P* (1976), option *M* (1979), option *M* et *P* (1980).

J. E. BERTIN, M. J. BERTIN. — **Algèbre linéaire et géométrie classique**. — Collection « Maîtrise de mathématiques pures ». — Un vol. broché,  $16 \times 24$ , de 148 p. — Masson, Paris/New York/Barcelone/Milan, 1981.

*Notions fondamentales*: Groupes; groupes quotients. Groupe opérant sur un ensemble. Conjugaison. Anneaux. Corps et anneaux intègres. Ensembles ordonnés. — *Algèbre linéaire*: Modules. Sommes directes. Familles libres; bases; modules libres. Formes multilinéaires. Déterminants. Dualité. Matrices. Espaces vectoriels. Dualité sur un corps. Rang. — *Anneaux principaux*: Anneaux principaux; exemples. Module sur un anneau principal. Groupes commutatifs de type fini. Sous-groupes fermés de  $\mathbf{R}^n$ . Endomorphismes d'un espace vectoriel. — *Algèbre extérieure*: Produit tensoriel de modules. Algèbre tensorielle. Algèbre extérieure. Algèbre extérieure d'un module libre. Applications aux endomorphismes d'un module libre de type fini. Dualité de l'algèbre extérieure d'un module libre de type fini. Espaces projectifs; grassmanniennes. — *Formes bilinéaires*: Dualité et orthogonalité. Interprétation matricielle. Groupes d'automorphismes. Isotropie et orthogonalité. Bases orthogonales (cas hermitien). Bases orthogonales (cas symétrique). Bases orthogonales (cas symétrique réel). Norme; distance. Espaces euclidiens et groupe orthogonal. Bases orthogonales (cas hermitien complexe); espace unitaire et groupe unitaire. Théorème spectral (cas unitaire). Théorème spectral (cas euclidien). Bases symplectiques (cas alternés). Quaternions. Géométrie non euclidienne.

M.-P. MALLIAVIN, A. WARUSFEL. — **Algèbre linéaire et géométrie classique: exercices**. — Collection « Maîtrise de mathématiques pures ». — Un vol. broché,  $16 \times 24$ , de 128 p. — Masson, Paris/New York/Barcelone/Milan/Mexico/Rio de Janeiro, 1981.

Notions fondamentales. Algèbre linéaire. Anneaux principaux. Algèbre extérieure. Formes bilinéaires.

W. E. RIDDLE, R. E. FAIRLEY. — **Software development tools**. — Proceedings of a workshop on software development tools, held at Pringree Park, Colorado in May, 1979. — Un vol. broché,  $16,5 \times 24$ , de viii, 280 p. — Prix: DM 39.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

INTRODUCTION. — NEEDS: A. N. Habermann: Tools for software system construction. — V. R. Lesser and J. C. Wileden: Issues in the design of tools for distributed software system development. — I. Nassi: A critical look at the process of tool development:

an industrial perspective. — EXPERIENCES: *R. A. Snowdon* : An experience-based assessment of development systems. — DEVELOPMENT SUPPORT SYSTEMS: *L. J. Osterweil* : A software lifecycle methodology and tool support. — *A. I. Wasserman* : Software tools and the user software engineering project. — PROCEDURAL DESCRIPTION TECHNIQUES: *B. Leavenworth* : The use of data abstraction in program design. — *W. E. Riddle* : Procedural approaches to software design modelling. — NON-PROCEDURAL DESCRIPTION TECHNIQUES: *A. C. Shaw* : Software specification languages based on regular expressions. — *J. M. Smith and D.C.P. Smith* : A data base approach to software specification. — ANALYSIS TOOLS: *R. L. London and L. Robinson* : The role of verification tools and techniques. — *R. E. Fairley* : Software validation and pre-implementation issues. — SUMMARY.

K. D. C. STOODLEY, T. LEWIS, C. L. S. STAINTON. — **Applied statistical techniques.** — Ellis Horwood series in mathematics and its applications. — Un vol. relié, 16 × 23,5, de 310 p. — Prix: £16.50. — Ellis Horwood limited, Chichester, and Halsted press: a division of John Wiley & Sons, New York/Chichester/Brisbane/Toronto, 1980.

*A review of basic statistical techniques* : Descriptive statistics. Probability distributions. Basic statistical inference. — *Regression analysis* : Introduction. Transformations to linear form. Multiple regression. Curvilinear regression. Examination of residuals. Use of computers. — *Design and analysis of experiments* : Introduction. One-way classification. Two-way classification without replication. Two-way classification with replication. Latin square design. Analysis of covariance. Factorial designs with factors at two levels. Use of computers. — *Nonparametric methods* : Introduction. One sample location test. Two matched samples location tests. Two independent samples location test.  $k$  independent samples location test. Two independent samples dispersion test. Rank correlation methods. — *Sampling inspection and quality control* : Introduction. Batch inspection. Continuous production inspection. — *Sample surveys* : Introduction. Simple random sampling. Stratified populations. Presentation and analysis of sample survey results. — *Forecasting* : Introduction. Decomposition of a time series. Long term forecasting. Adaptive forecasting. Further short term forecasting techniques.

Hanif D. SHERALI, C. M. SHETTY. — **Optimization with disjunctive constraints.** — Lecture Notes in Economics and Mathematical systems, vol. 181. — Un vol. broché, 16,5 × 24, de VIII, 156 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*Introduction* : Basic concepts. Special cases of disjunctive programs and their applications. — *Basic concepts and principles* : Surrogate constraints. Pointwise-supremal cuts. Basic disjunctive cut principle. — *Generation of deep cuts using the fundamental disjunctive inequality* : Defining suitable criteria for evaluating the depth of a cut. Deriving deep cuts for DC1. Deriving deep cuts for DC2. Other criteria for obtaining deep cuts. Some standard choices of surrogate constraint multipliers. — *Effect of disjunctive statement formulation on depth of cut and polyhedral annexation techniques* : Illustration of the tradeoff between effort for cut generation and the depth of cut. Some general comments with applications to the generalized lattice point and the linear complementarity problem. Sequential polyhedral annexation. A supporting hyperplane scheme for improving edge extensions. Illustrative example. — *Generation of facets of the closure of the convex hull of feasible points* : A linear programming equivalent of the disjunctive program. Alternative characterization of the closure of the convex hull of feasible points. Generation of facets of the closure of the convex hull of feasible points. Illustrative example. Facial disjunctive programs. — *Derivation and improvement of some existing cuts through dis-*

*junctive principles*: Gomory's mixed integer cuts. Convexity or intersection cuts with positive edge extensions. Reverse outer polar cuts for zero-one programming. — *Finitely convergent algorithms for facial disjunctive programs with applications to the linear complementarity problem*: Principal aspects of facial disjunctive programs. Stepwise approximation of the convex hull of feasible points. Approximation of the convex hull of feasible points through an extreme point characterization. Specializations of the extreme point method for the linear complementarity problem. — *Some specific applications of disjunctive programming problems*: Some examples of bi-quasiconcave problems. Load balancing problem. The segregated storage problem. Production scheduling on  $N$ -identical machines. Fixed charge problem. Project selection/portfolio allocation/goal programming. Other applications.

Jürgen WOLTERS. — **Stochastic dynamic properties of linear econometric models.** — Lecture Notes in Economics and Mathematical systems, vol. 182. — Un vol. broché, 16,5 × 24, de VIII, 154 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*The linear dynamic econometric model*: Introduction. Structural, reduced and final form. Solutions of the model. — *Spectral representation of the linear dynamic model with constant coefficients*: Derivation of the spectral matrix. Numerical approaches. An example: effects of residuals. Spectral matrix in unstable models. — *Spectral representation of a linear dynamic econometric model with stochastic coefficients*: Methodological approach. Effects of alternative estimation methods on the dynamic properties of an aggregated demand model of the FRG. Empirical spectral analysis. — *Effects of exogenous variables on the cyclic properties of an econometric model*: Introduction. Dynamic properties of an aggregated model of the FRG. Stabilization policies. — *Summary*.

Rainer E. BURKARD, Ulrich DERIGS. — **Assignment and matching problems: solution methods with FORTRAN-programs.** — In cooperation with T. Bönninger, G. Katzakidis. — Lecture Notes in Economics and Mathematical systems, vol. 184. — Un vol. broché, 16,5 × 24, de VII, 148 p. — Prix: DM 28.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

The linear sum assignment problem. The linear bottleneck assignment problem. The cardinality matching problem. The sum matching problem. The bottleneck matching problem. The Chinese postman problem. Quadratic assignment problems. *QAP* heuristic 1: the method of increasing degree of freedom. *QAP* heuristic 2: cutting plane and exchange method. General subroutines.

Klaus SCHITTKOWSKI. — **Nonlinear programming codes: information, tests, performance.** — Lecture Notes in Economics and Mathematical systems, vol. 183. — Un vol. broché, 16,5 × 24, de VIII, 242 p. — Prix: DM 34.00. Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*Introduction.* — *Optimization methods*: Line-search algorithms. Quadratic programming. Unconstrained optimization. Penalty methods. Multiplier methods. Quadratic approximation methods. Generalized reduced gradient methods. The method of Robinson. — *Optimization programs*: Program organization. Description of the programs. — *The construction of test problems*: Fundamentals of the test problem generator. General test problems. Linearly constrained test problems. Degenerate test problems. Ill-con-

ditioned test problems. Indefinite test problems. Convex test problems. — *Performance evaluation*: Notations. Efficiency, reliability, and global convergence. Performance for solving degenerate, *ill*-conditioned and indefinite problems. Sensitivity to slight variations of the problem. Sensitivity to the position of the starting point. Ease of use. How to get a final score. — *Conclusions, recommendations, remarks*: Final conclusions. Recommendations for the design of optimization programs. Some technical details. — *Appendices*: Numerical data for constructing test problems. Sensitivity analysis for the test problems. Further results. Evaluation of significance factors.

**Journées de géométrie algébrique d'Angers (juillet 1979) = Algebraic geometry Angers 1979: variétés de petite dimension.** — Edited by Arnaud Beauville. — Un vol. relié, 17 × 24,5, de XII, 323 p. — Prix: Dfl. 100.00. — Sijthoff & Noordhoff, Alphen aan den Rijn/Rockville, Maryland, 1980.

FIBRES VECTORIELS: *A. van de Ven*: Twenty years of classifying algebraic vector bundles. — *Robin Hartshorne*: Four years of algebraic vector bundles: 1975-1979. — *Wolf Barth*: Kummer surfaces associated with the Horrocks-Mumford bundle. — PÉRIODES DES VARIÉTÉS ALGÈBRIQUES: *James A. Carlson and Phillip A. Griffiths*: Infinitesimal variations of Hodge structure and the global Torelli problem. — *James A. Carlson, Eduardo H. Cattani and Aroldo G. Kaplan*: Mixed Hodge structures and compactifications of Siegel's space. — *James A. Carlson*: Extensions of mixed Hodge structures. — *A. Conte and J. P. Murre*: The Hodge conjecture for Fano complete intersections of dimension four. — *Ron Donagi and Roy Smith*: The degree of the Prym map onto the moduli space of five dimensional abelian varieties. — *Frans Oort and Joseph Steenbrink*: The local Torelli problem for algebraic curves. — SURFACES: *Arnaud Beauville*: Sur le nombre maximum de points doubles d'une surface dans  $P^3$  ( $\mu(5) = 31$ ). — *S. Bloch*: On an argument of Mumford in the theory of algebraic cycles. — *J.-L. Colliot-Thelene et J. Sansuc*: La descente sur les variétés rationnelles. — *Yoichi Miyaoka*: On the Mumford-Ramanujam vanishing theorem on a surface. — *C. A. M. Peters*: On automorphisms of compact Kähler surfaces. — VARIÉTÉS DE DIMENSION 3: *Yujiro Kawamata*: A characterization of an abelian variety. — *Miles Reid*: Canonical 3-folds. — *Kenji Ueno*: Birational geometry of algebraic threefolds.

Eberhard SCHRÖDER. — **Dürer Kunst und Geometrie: Dürers künstlerisches Schaffen aus der Sicht seiner „Underweysung“.** — Wissenschaft und Kultur, vol. 37. — Un vol. relié, 17,5 × 24,5, de 79 p. — Prix: FS 20.00. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1980.

Kurze Inhaltsübersicht zur „Underweysung“. Dürers „Underweysung“ im Spiegel des allgemeinen Wissensstandes zur Zeit der Renaissance. Rekonstruktionsanalysen an Kunstwerken Dürers, die vor der zweiten Italienreise entstanden. Dürers zweite Italienreise. Rekonstruktionsanalyse an dem Kupferstich „Hieronymus im Gehäuse“. Rekonstruktionsanalyse an dem Kupferstich „Melancholie“ Schlussfolgerungen. Literatur. Wichtige Lebensdaten von Dürer. Jahreszahlen aus der Zeit der Renaissance.

**Harmonic analysis and representations of semisimple Lie groups.** — Lectures given at the NATO Advanced Study Institute on representations of Lie groups and Harmonic analysis, held at Liège, Belgium, September 5-17, 1977. — Edited by J.A. Wolf, M. Cahen,

and M. de Wilde. — *Mathematical physics and applied mathematics*, vol. 5. — Un vol. relié, 16 × 23, de VIII, 495 p. — Prix: Dfl. 125.00. — D. Reidel Publishing Company, Dordrecht/Boston/London, 1980.

*R. J. Blattner*: General background. — *J. A. Wolf*: Foundations of representation theory for semisimple Lie groups. — *V. S. Varadarajan*: Infinitesimal theory of representations of semisimple Lie groups. — *P. C. Trombi*: The role of differential equations in the Plancherel theorem. — *M. Atiyah and W. Schmid*: A geometric construction of the discrete series for semisimple Lie groups. — *M. Atiyah and W. Schmid*: Erratum to the paper: A geometric construction of the discrete series for semisimple Lie groups. — *M. Flato and D. Sternheimer*: Deformations of Poisson brackets. Separate and joint analyticity in group representations. Non-linear group representations and physical applications. — *J. Simon*: Introduction to the  $l$ -cohomology of Lie groups. — *H. Furstenberg*: Random walks on Lie groups.

**Trends in applications of pure mathematics to mechanics, volume III.** — A collection of invited papers presented at a symposium at Heriot-Watt University in September 1979. — Edited by R. J. Knops. — *Monographs and studies in mathematics*, vol. 11. — Un vol. relié, 16 × 24, de IV, 234 p. — Prix: £28.00. — Pitman advanced Publishing program, Boston/London/Melbourne, 1981.

*S. Albeverio, Ph. Blanchard and R. Høegh-Krohn*: Feynman path integrals, the Poisson formula and the theta function for the Schrödinger operators. — *J. F. G. Auchmuty*: Models of rotating self-gravitating liquids. — *T. Brooke Benjamin*: Theoretical problems posed by gravity-capillary waves with edge constraints. — *B. Bojarski*: Analytical and geometrical properties of generalized potentials. — *G. Capriz and P. Podio-Guidugli*: Questions of uniqueness in finite elasticity. — *C. M. Dafermos*: The equations of elasticity are special. — *J. Glimm, D. Marchesin and O. McBryan*: The Buckley-Leverett equation: theory, computation and application. — *G. A. Hagedorn*: Semiclassical quantum mechanics II: the large mass asymptotics for coherent states. — *A. Haraux*: Behaviour at infinity for dissipative systems with forcing term in Hilbert space. — *G. Iooss*: The behaviour of solutions lying on an invariant 2-torus arising from the bifurcation of a periodic solution. — *K. Kirchgässner and J. Scheurle*: Bifurcation from the continuous spectrum and singular solutions. — *S. Klainerman*: Classical solutions to nonlinear wave equations and non-linear scattering. — *W. Kosinski*: Uniqueness theorems in dynamics of dissipative bodies with nonlinear material structures. — *T. P. Liu*: A system of quasi-linear hyperbolic partial differential equations. — *T. Nishida*: Asymptotic behaviour of solutions of the Boltzmann equation. — *J. E. Taylor*: Surface tension functions and their surfaces of least energy. — *R. Témam*: Variational problems of plasticity. — *A. Vanderbauwhede*: Hopf bifurcation for abstract nonlinear equations.

JAMES O. BERGER. — **Statistical decision theory: foundations, concepts, and methods.** — Springer series in statistics. — Un vol. relié, 16 × 24, de XV, 425 p. — Prix: DM 45.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1980.

*Basic concepts*: Basic elements. Decision rules and risk. Randomized decision rules. Decision principles. Foundations. Sufficient statistics. Convexity. — *Utility and loss*: Utility theory. The utility of money. The loss function. Criticisms. — *Prior information and subjective probability*: Subjective probability. Prior information. Criticisms. The statistician's role. — *Bayesian analysis*: The posterior distribution. Bayesian inference. Bayesian decision theory. Admissibility of Bayes and generalized Bayes rules. Robust-

ness of Bayes rules. Conclusions. — *Minimax analysis*: Game theory. Statistical games. Evaluation of the minimax principle. — *Invariance*: Formulation. Location parameter problems. Other examples of invariance. Maximal invariants. Invariance and non-informative priors. Invariance and minimaxity. Admissibility of invariant rules. Conclusions. — *Preposterior and sequential analysis*: Optimal fixed sample size. Sequential analysis-notation. Bayesian sequential analysis. The sequential probability ratio test. Minimax sequential procedures. Discussion of sequential analysis. — *Complete and essentially complete classes*: Complete and essentially complete classes from earlier chapters. One-sided testing. Monotone decision problems. Limits of Bayes rules. Other complete and essentially complete classes of tests. Continuous risk functions. Stein's necessary and sufficient condition for admissibility. — *Appendices*: Common statistical densities. Technical arguments. — Exercices à la fin de chaque chapitre.

**Abstract Cauchy problems and functional differential equations.** — Proceedings of the Workshop on functional-differential equations and nonlinear semigroups held at the Volksbildungsheim Schloss Retzhof, June 25-30, 1979. — Edited by F. Kappel and W. Schappacher. — Research notes in mathematics, vol. 48. — Un vol. broché, 16 5 × 24, de 238 p. — Prix: £9.50. — Pitman advanced publishing program, Boston/London/Melbourne, 1981.

*V. Barbu*: A semigroup approach to an infinite delay equation in Hilbert space. — *H. Jeggle*: A general framework for the approximation of semi-groups of nonlinear operators. — *K. Kunisch*: A semigroup approach to partial differential equations with delay. — *K. G. Magnusson and A. J. Pritchard*: Local controllability for nonlinear evolution equations. — *R. H. Martin, Jr.*: Asymptotic behavior of solutions to a class of quasimonotone functional differential equations. — *J. Mawhin*: Monotonicity and two point boundary value problems for nonlinear second order differential equations in Hilbert spaces. — *C. Picard*: Nonlinear variational inequalities and nonlinear potential theory. — *L. C. Piccinini*:  $G$ -convergence and evolution problems. — *M. Pierre*: Evolution equations with irregular obstacles. — *W. Schappacher*: Translation semigroups and functional differential equations. — *Klaus Schmitt*: Oscillations in nonlinear delay equations. — *R. Villella-Bressan*: Flow invariant sets for functional differential equations. — *H. O. Walther*: Delay equations: instability and the trivial fixed point's index.

Erich LAMPRECHT. — **Lineare algebra I.** — Uni-Taschenbücher, vol. 1021. — Un vol. broché, 12 × 18,5, de ix, 231 p. — Prix: FS 19.80. — Birkhäuser Verlag, Basel/Boston/Stuttgart, 1980.

*K-Vektorräume und ihre Homomorphismen*: Algebraische Grundbegriffe. Die Modulstruktur von  $K$ -Vektorräumen. Lineare Unabhängigkeit, Vektorraumbasen. Linearformen, Bilinearformen, Dualität. — *K-Endomorphismen, Elementarteiler und Normalformenprobleme*: Algebraische Eigenschaften von  $K$ -Homomorphismen,  $K$ -Endomorphismen und zugeordneten Matrizen. Moduln über Hauptidealringen, Elementarteilersatz. Normalformen von Matrizen und Anwendungen. — Exercices pour chaque chapitre.

**Differential geometrical methods in mathematical physics.** — Proceedings of the conferences held at Aix-en-Provence, September 3-7, 1979 and Salamanca, September 10-14, 1979. — Ed. by P. L. Garcia, A. Perez-Rendon, and J. M. Souriau. — Lecture Notes in Mathematics, vol. 836. — Un vol. broché, 16,5 × 24, de xii, 538 p. — Prix: DM 53.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*Part I*: Proceedings of the International colloquium of the CNRS held at Aix-en-Provence, September 3-7, 1979, edited by J. M. Souriau: Symplectic mechanics and the

calculus of variations: 5 exposés par F. J. Bloore, S. Benenti & W. M. Tulczyjew, W. M. Tulczyjew, C. Duval, P. A. Horvathy. — Geometric quantization: 7 exposés par J. M. Souriau, J. A. Wolf, J. H. Rawnsley, H. Hess, D. J. Simms, G. Kaiser, E. Onofri. — Deformations of Lie algebras: 2 exposés par A. Lichnerowicz, D. Arnal & J. C. Cortet. — Classical field theory: 3 exposés par J. Kijowski, A. Z. Jadczyk, H.-P. Künzle & J. R. Savage. — Supersymmetry and supergravity: 3 exposés par J. Lukierski, S. Ferrara, S. Deser. — *Part II*: Proceedings of the conference held at Salamanca, September 10-14, 1979, edited by P. L. Garcia and A. Perez-Rendon: Gauge theories: 7 exposés par R. Bott, V. Moncrief, P. L. Garcia, M. Carmeli & B. Z. Moroz, Y. Ne'eman & J. Thierry-Mieg, R. Kerner, R. N. Sen. — Quantization and symplectic structures: 6 exposés par A. Lichnerowicz, I. E. Segal, C. Günther, D. J. Simms, H. R. Petry, V. Guillemin & S. Sternberg. — General relativity: 4 exposés par S. Deser, A. Perez-Rendon, J. Kijowski, W. Kopczynski. — Classical field theory and analytical mechanics: 4 exposés par W. M. Tulczyjew, P. Dedecker & W. M. Tulczyjew, T. Szapiro, S. Benenti.

Josef MEIXNER, Friedrich W. SCHÄPFKE, Gerhard WOLF. — **Mathieu functions and spheroidal functions and their mathematical foundations; further studies.** — Lecture notes in Mathematics, vol. 837. — Un vol. broché, 16,5 × 24 de VII, 126 p. — Prix: DM 18.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1980.

*Introduction and preface.* — *Foundations*: Eigenvalue problems with two parameters. Simply separated operators. — *Mathieu functions*: Integral relations. Addition theorems. On the computation of the characteristic exponent. On the eigenvalues for complex  $h^2$ . Improved estimates of the radii of convergence. Asymptotic estimates for large  $h^2$ . On the power series of the eigenvalues. — *Spheroidal functions*: Integral with products of spheroidal functions. On the eigenvalues for complex  $\gamma^2$ . The spheroidal functions for  $\mu^2 = 1$ ,  $\lambda = 0$ . Applications and numerical tables. — Appendix.

**Global differential geometry and global analysis.** — Proceedings of the colloquium held at the Technical University of Berlin, November 21-24, 1979. — Edited by D. Ferus, W. Kühnel, U. Simon, and B. Wegner. — Lecture Notes in Mathematics, vol. 838. — Un vol. broché, 16,5 × 24, de XI, 299 p. — Prix: DM 34.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1981.

*K. Leichtweiss*: E. B. Christoffels Einfluss auf die Geometrie. — *S. Alexander*: Distance geometry in Riemannian manifolds-with-boundary. — *D. Barthel, R. Kuemritz*: Laplacian with a potential. — *L. Berard Bergery, J. P. Bourguignon*: Laplacian and Riemannian submersions with totally geodesic fibres. — *R. Boehme*: A Plateau problem with many solutions for boundary curves in a given knot class. — *J. P. Bourguignon*: Ricci curvature and Einstein metrics. — *U. Brehm, W. Kuehnel*: Smooth approximation of polyhedral surfaces with respect to curvature measures. — *J. Bruening*: Invariant eigenfunctions of the Laplacian and their asymptotic distribution. — *P. Buser, H. Karcher*: The Bieberbach case in Gromov's almost flat manifold theorem. — *T. Cecil, P. Ryan*: Tight spherical embeddings. — *B. Y. Chen, L. Verstraelen*: Characterizations of space forms by hypersurfaces. — *J. Czyz*: On graded bundles and their geometry. — *A. Derdzinski*: Compact Riemannian manifolds with harmonic curvature and non-parallel Ricci tensor. — *M. P. Do Carmo*: Stability of minimal submanifolds. — *A. Gray*: A generalization of Weyl's tube formula. — *S. Helgason*: The X-ray transform on a symmetric space. — *H.-Ch. Im Hof*: Visibility, horocycles, and the Bruhat decomposition. — *S. Kobayashi*: On holomorphic connections. — *I. Kolar*: Fiber parallelism and connections. — *O. Kowalski*: Riemannian manifolds the geodesic balls of which are near to the Euclidean balls by volume. — *R. Langevin*: Tight foliations. — *L. Lemaire*: Minima and critical points of

the energy in dimension two. — *K. H. Mayer* :  $S^1$ -actions on almost complex manifolds. — *J. D. Moore* : On conformal immersions of space forms. — *V. Olikier* : Some remarks on elliptic equations and infinitesimal deformations of submanifolds. — *Z. Olszak* : The spectrum of the Laplacian and the curvature of Sasakian manifolds. — *T. Sunada* : Geodesics chains and the spherical mean operator. — *G. Tsagas* : The spectrum of the Laplace operator for a special complex manifold. — *J. C. Wood* : On the holomorphicity of harmonic maps from a surface. — *I. Bivens, J. P. Bourguignon, A. Derdzinski, D. Ferus, O. Kowalski, T. Klotz Milnor, V. Olikier, U. Simon, W. Struebing, K. Voss* : Discussion on Codazzi-tensors.

**Cabal seminar 77-79.** — Proceedings, Caltech-UCLA logic seminar 1977-79. — Edited by *A. S. Kechris, D. A. Martin, and Y. N. Moschovakis*. — Lecture Notes in Mathematics, vol. 839. — Un vol. broché, 16,5 × 24, de v, 274 p. — Prix: DM 29.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1981.

*C. Dellacherie* : Capacities and analytic sets. — *A. S. Kechris* : Homogeneous trees and projective scales. — *A. S. Kechris, E. M. Kleinberg, Y. N. Moschovakis and W. H. Woodin* : The axiom of determinacy, strong partition properties and non-singular measures. — *A. S. Kechris, R. M. Solovay and J. R. Steel* : The axiom of determinacy and the prewellordering property. — *A. S. Kechris* : Souslin cardinals,  $\kappa$ -Souslin sets and the scale property in the hyperprojective hierarchy. — *J. R. Steel* : Closure properties of point-classes. — *A. S. Kechris* : A note on wadge degrees. — *Y. N. Moschovakis* : Ordinal games and playful models. — *H. S. Becker and Y. N. Moschovakis* : Measurable cardinals in playful models. — *D. A. Martin* :  $\pi^1_2$  monotone inductive definitions. — *P. Odifreddi* : Trees and degrees. — *Appendix* : Progress report on the Victoria Delfino problems.

**Dan HENRY.** — **Geometric theory of semilinear parabolic equations.** — Lecture notes in Mathematics, vol. 840. — Un vol. broché, 16,5 × 24, de iv, 348 p. — Prix: DM 39.00. — Springer-Verlag, Berlin/Heidelberg/New York, 1981.

*Preliminaries* : What is geometric theory? Basic facts and notation. Sectorial operators and analytic semigroups. Fractional powers of operators. Invariant subspaces and exponential bounds. — *Examples of nonlinear parabolic equations in physical biological and engineering problems* : Nonlinear heat equation. Flow of electrons and holes in a semiconductor. Hodgekin-Huxley equations for the nerve axon. Chemical reactions in a catalyst pellet. Population genetics. Nuclear reactor dynamics. Navier-Stokes and related equations. — *Existence, uniqueness and continuous dependence* : Examples and counter-examples. The linear Cauchy problem. Local existence and uniqueness. Continuous and differentiable dependence of solutions. Smoothing action of the differential equation. Examples, the Navier-Stokes equation. — *Dynamical systems and Liapunov stability* : Dynamical systems and Liapunov functions. Converse theorem on asymptotic stability. Invariance principle. — *Neighborhood of an equilibrium point* : Stability and instability by the linear approximation. The saddle-point property. The Chafee-Infante problem and gradient flows. Traveling waves of parabolic equations. Essential spectrum of some ordinary differential operators. — *Invariant manifolds near an equilibrium point* : Existence and stability of an invariant manifold. Critical cases of stability. Bifurcation and transfer of stability for equilibrium points. Bifurcation of a periodic orbit from an equilibrium point. — *Linear nonautonomous equations* : Evolution operators and estimates. Linear periodic systems. The adjoint system and backward uniqueness. Slowly varying coefficients. Rapidly varying coefficients. Exponential dichotomies. — *Neighborhood of a periodic solution* : Stability and instability for nonautonomous systems. Orbital stability

and instability for autonomous systems. Perturbation of periodic solutions. The Poincaré map. Bifurcation and transfer of stability for periodic solutions. — *Neighborhood of an invariant manifold*: Existence, stability and smoothness of invariant manifolds. A coordinate system near an invariant manifold. Examples. — *Two examples*: A selection-migration model in population genetics. A problem in the theory of combustion.

**Séminaire Bourbaki, vol. 1979/80: exposés 543-560.** — Avec table par noms d'auteurs de 1967/68 à 1979/80. — Lecture Notes in Mathematics, vol. 842. — Un vol. broché, 16,5 × 24, de iv, 317 p. — Prix: DM 34.50. — Springer-Verlag, Berlin/Heidelberg/New York, 1981.

*Pierre Deligne*: Le groupe fondamental du complément d'une courbe plane n'ayant que des points doubles ordinaires est abélien. — *Michel Demazure*: Caractérisations de l'espace projectif (conjecture de Hartshorne et de Frankel) d'après Shigefumi Mori. — *Pierre Gabriel*: Algèbres auto-injectives de représentation finie. — *Michaël Gromov*: Hyperbolic manifolds according to Thurston and Jørgensen. — *Dale Husemoller*: La décomposition des espaces des lacets et la torsion impaire des groupes d'homotopie. — *Alberto Tognoli*: Algebraic approximation of manifolds and spaces. — *Bernard Beauzamy*: Sous-espaces invariants dans les espaces de Banach. — *Pierre Cartier*: La conjecture locale de Langlands pour  $GL(2)$  et la démonstration de Ph. Kutzko. — *Alain Connes*: Feuilletages et algèbres d'opérateurs. — *Nicole Desolneux-Moulis*: Orbites périodiques des systèmes hamiltoniens autonomes. — *Luc Lemaire*: Existence des applications harmoniques et courbure des variétés. — *Dennis Sullivan*: Travaux de Thurston sur les groupes quasi-fuchsien et les variétés hyperboliques de dimension 3 fibrées sur  $S^1$ . — *Claude Bardos*: Apparition éventuelle de singularités dans des problèmes d'évolution non linéaires. — *Lionel Bérard-Bergery*: La courbure scalaire des variétés riemanniennes. — *Y. Colin de Verdière*: La matrice de scattering pour l'opérateur de Schrödinger sur la droite réelle. — *Michel Duflo*: Caractères des groupes de Lie résolubles. — *Harry Furstenberg*: Rigidity and cocycles for ergodic actions of semi-simple Lie groups. — *Yves Meyer*: Régularité des solutions des équations aux dérivées partielles non linéaires.

**Bruce D. SPENCER.** — **Benefit-cost analysis of data used to allocate funds.** — Lecture Notes in Statistics, vol. 3. — Un vol. broché, 15,5 × 23,5, de viii, 296 p. — Prix: DM 29.00. — Springer-Verlag, New York/Heidelberg/Berlin, 1980.

*Introduction.* — *Loss function and benefit measurement*: Utility and social welfare. Equity. A simple loss function for errors in allocation. Estimating the parameters of the loss function  $L(f, \theta)$  for GRS. Fisher-consistency and other properties of the loss function  $L(f, \theta)$ . More general loss functions:  $L_H(f, \theta)$ ,  $L_w(f, \theta)$ . Exponential loss functions. — *The delta method*: Outline. Notation. Description of the delta method. Applicability of the delta method to GRS. Application of the delta method to calculating expected loss. — *Data used in general revenue sharing*: Population (state level). Urbanized population. Population (substate level). Total money income, per capita income (state level). Per capita income (substate level). Personal income. Net state and local taxes. State individual income taxes. Federal individual income tax liabilities. Income tax amount (state level). Adjusted taxes (substate level). Intergovernmental transfers (substate level). Interrelationships among state-level data elements. Interrelationships among substate data elements. Outline-symbol glossary. — *Interstate allocation in GRS*: Notation. Conclusions. Assumptions and degrees of approximation. Derivations and proofs. — *Intrastate allocations in GRS*: Overview. Determination of substate allocations. Notation. Assumptions and degrees of approximations. Conclusions. — *Computations and analyses*: Errors in allocation to states. Substate errors in allocation. Benefit analysis. Summary of findings. —

*Policy perspectives and recommendations*: Redundancy of allocation formulas. Data burdens imposed by legislation. Minimizing large errors in allocation. Uniform biases, nonuniform variances. Adjusting for undercoverage or other suspected biases. Improving the coverage of the decennial census. State errors versus substate errors. Allocation formulas as approximations. Other uses of data. — *Appendices*: Tables of biases in data. Determination of general revenue sharing allocations.

Brian CONOLLY. — **Techniques in operational research, vol. 2: models, search and randomization.** — Ellis Horwood series in mathematics and its applications. — Un vol. relié, 16 × 23,5, de 338 p. — Prix: £21.50 relié, £7.50 broché. — Ellis Horwood limited, Chichester, and Halsted press: a division of John Wiley and Sons, New York/Chichester/Brisbane/Toronto, 1981.

*Deterministic population models*: Some Volterra models. Models of Lanchester. Epidemic models. Spatial propagation. Application to epidemic theory. — *Stochastic population models*: Single population. Logistic law. Diffusion approximation. Mixed immigration-death process: service system  $M/M/\infty$ . The Lanchester models. The spread of epidemics by carriers: G. Weiss' models. The general epidemic. Spread in space. — *Principles of detection and search*: The concept of relative space. Models for the detection process: discrete models. The continuous case. The inverse cube law. Searcher and target in relative motion. Extension of the continuous model. Model for random transmissions by searcher with possibility of counterdetection by target and abortion of search. Location and tracking. Some curves of pursuit. Collision course pursuit. Classical pursuit. Pursuit curve with lead. Line of sight guidance. — *Random versus deterministic search or transit*: Some models. The meaning of random motion. A diffusion approach. Degradation due to target going out of range. General comparison of random and deterministic search. Further perspectives on random patrols. Optimal distribution of search effort. Procedure to calculate  $\phi(x)$ . — *Some notes on geometrical probability*: The line. Maximum and minimum distances. Rényi's car parking problem. The circle. Distance between random points in circle. The rectangle. Distance between two random points in rectangle. — *Computers in operational research*: Monte Carlo methods. The Buffon needle problem. Simulation. — *The generation of pseudorandom numbers*: Pseudouniform generators. Some elementary number theory. General properties of multiplicative congruential generator. Tests of attributes of sequences. Mixed multiplicative congruential generator. Correlation properties of sequences. Additive congruential methods: the Fibonacci generator  $F(N, m)$ . The generator  $F(N, 2^b)$ . The generators  $F(N, p)$  with  $p$  prime. The generator  $F(N, 10)$ . Brief notes on sampling from non-uniform distributions. — *Linear congruential generators*: Solution of congruences. Euler's function. Multiplicative and mixed multiplicative congruential generators. Congruential methods of higher degrees. Integral polynomial  $P_N(x)$  associated with  $\mathcal{F}$ . Some properties of irreducible polynomials  $P_N(x)$  and their associated sequences. Sequences with reducible associated polynomials. A general result concerning periods modulo  $p^\alpha$ ,  $p$  prime. Two particular results about periods. Irreducibility. Table of maximum periods. — *Non-uniform pseudo-generators*: Continuous uncorrelated random variables. Discrete distributions. Other methods for uncorrelated normal samples. Beta and gamma distribution. Correlated Gaussian samples. Stationary random processes. Correlated exponential pairs.

Alistair I. MEES. — **Dynamics of feedback systems.** — A Wiley-interscience publication. — Un vol. relié, 16 × 23,5, de x, 214 p. — Prix: £12.95. — John Wiley and Sons, Chichester/New York/Brisbane/Toronto, 1981.

*Introduction*: Difference equations and blowflies. Systems. Feedback. What the book is about. Facts and definitions. — *Qualitative theory of ordinary differential equations*:

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**Analytical and numerical approaches to asymptotic problems in analysis.** — Proceedings of the conference on analytical and numerical approaches to asymptotic problems, University of Nijmegen, The Netherlands, June 9-13, 1980. — Edited by O. Axelsson, L. S. Frank, and A. van der Sluis. — North-Holland mathematics studies, vol. 47. Un vol. broché,  $16 \times 24$ , de xvi, 381 p. — Prix: Dfl. 110.00. North-Holland Publishing Company, Amsterdam/New York/Oxford, 1981.

*S. Yu. Dobrokhotov and V. P. Maslov* : Finite gap almost periodic solutions in asymptotical expansions. — *H. Duistermaat* : Periodic solutions near equilibrium points of Hamiltonian systems. — *H. Duistermaat* : Asymptotics for elementary spherical functions. — *P. C. Fife* : On the question of the existence and nature of homogeneous-center target patterns in the Belousov-Zhabotinskii reagent. — *E. M. de Jager and R. Geel* : Singular perturbations of hyperbolic type. — *F. C. Hoppensteadt and W. L. Miranker* : Computation by extrapolation of solutions of singular perturbation problems. — *D. Huet* : Proper approximation of a normed space and singular perturbations. — *C. Johnson and U. Nävert* : An analysis of some finite element methods for advection-diffusion problems. — *Y. Kannai* : Short time asymptotic behavior for parabolic equations. — *R. B. Kellog* : Difference approximation for a singular perturbation problem with turning points. — *J. Lorenz* : Stability and consistency analysis of difference methods for singular perturbation problems. — *A. R. Mitchell, D. F. Griffiths and A. Meiring* : Finite element Galerkin methods for convection-diffusion and reaction-diffusion. — *S. Osher* : Numerical solution of singular perturbation problems and hyperbolic systems of conservation laws. — *M. Bertsch and L. A. Peletier* : Nonstationary filtration in partially saturated media. — *H. J. Reinhardt* : A-posteriori error estimates and adaptive finite element computations for singularly perturbed one space dimensional parabolic equations. — *M. E. Taylor* : Diffraction of waves by cones and polyhedra. — *R. Temam* : Some asymptotic problems in mechanics. — *B. Aulbach* : Asymptotic amplitude and phase for isochronic families of periodic solutions. — *O. Axelsson and I. Gustafsson* : Quasioptimal finite element approximations of first order hyperbolic and of convection-dominated convection-diffusion equations. — *D. Caillerie* : Homogenization of the equation of stationary diffusion in cylindrical domains. — *L. S. Frank and E. W. van Groesen* : Singular perturbations of an elliptic operation with discontinuous nonlinearity. — *L. S. Frank and W. D. Wendt* : Coercive singular perturbations: asymptotics and reduction to regularly perturbed boundary value problems. — *A. Iserles* : Efficient two-step numerical methods for parabolic differential equations. — *R. M. M. Mattheij* : Estimating the discretization error in three point difference schemes for second order linear singularly perturbed BVP. — *J. P. Pauwelussen* : Failure of nerve impulse propagation for nonuniform nerve axons. — *M. Schatzman* : The penalty method

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Laurence YOUNG. — **Mathematicians and their times: history of mathematics and mathematics of history.** — North-Holland mathematics studies, vol. 48. — *Notas de matematica*, vol. 76. — Un vol. broché, 16,5 × 24, de x, 344 p. — Prix: Dfl. 65.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1981.

*Generalities*: The non-mathematical framework. The trained observer. The embellishment of truth. The intrusion of personal feelings. Some rules of critical analysis. — *Early history*: The historical significance of mathematics. The meaning of mathematics. The distant past. The Greek school of mathematics. The destructive bends. The miraculous preservation. — *The slow renaissance*: Dismal prospects in Western Europe. The pioneers who came too soon. The leadership that could not last. — *The new beginning*: The beginnings of analysis. Newton. Preparing for bankruptcy. Euler. The rise of mathematics in Paris. — *The romantic period*: The flouting of arithmetic. The founding of the Ecole polytechnique. Gauss. The first romantics. Riemann and Weierstrass. Between two worlds. — *The dream of a conceptual age, and the hard reality of struggle for existence*: The unprized heritage. The significance of Plato for mathematics. Cantor and sets. Goettingen. — *The age of contradictions and of the great question marks*: The art of the possible. The expansion of mathematics. Cambridge. The Hardy-Littlewood era. The battleground of ideas. The uncertain further blooming. The other side of catastrophe.

Jean DIEUDONNÉ. — **History of functional analysis.** — North-Holland mathematics studies, vol. 49. — *Notas de matematica*, vol. 77. — Un vol. broché, 16,5 × 24, de vi, 312 p. — Prix: Dfl. 65.00. — North-Holland Publishing Company, Amsterdam/New York/Oxford, 1981.

*Linear differential equations and the Sturm-Liouville problem*: Differential equations and partial differential equations in the XVIIIth century. Fourier expansions. The Sturm-Liouville theory. — *The "crypto-integral" equations*: The method of successive approximations. Partial differential equations in the XIXth century. The beginnings of potential theory. The Dirichlet principle. The Beer-Neumann method. — *The equation of vibrating membranes*: H. A. Schwarz's 1885 paper. The contributions of Poincaré. — *The idea of infinite dimension*: Linear algebra in the XIXth century. Infinite determinants. Groping towards function spaces. The passage "from finiteness to infinity". — *The crucial years and the definition of Hilbert space*: Fredholm's discovery. The contributions of Hilbert. The confluence of geometry, topology and analysis. — *Duality and the definition of normed spaces*: The search for continuous linear functionals. The  $L^p$  and  $l^p$  spaces. The birth of normed spaces and the Hahn-Banach theorem. The method of the gliding hump and Baire category. — *Spectral theory after 1900*: F. Riesz's theory of compact operators. The spectral theory of Hilbert. The work of Weyl and Carleman. The spectral theory of von Neumann. Banach algebras. Later developments. — *Locally convex spaces and the theory of distributions*: Weak convergence and weak topology. Locally convex spaces. The theory of distributions. — *Applications of functional analysis to differential and partial differential equations*: Fixed point theorems. Carleman operators and generalized eigenvectors. Boundary problems for ordinary differential equations. Sobolov spaces and "a priori" inequalities. Elementary solutions, parametrices and pseudo-differential operators.

William PARRY. — **Topics in ergodic theory.** — Cambridge tracts in mathematics, vol. 75. — Un vol. relié, 14,5 × 22, de x, 110 p. — Prix: £10.00. — Cambridge University Press, Cambridge/London/New York/New Rochelle/Melbourne/Sydney, 1981.

*Introduction*: Origins. Preliminaries. Conventions. — *The principal ergodic theorems*: Uniform distribution (mod 1) and some topological dynamics. Recurrence and the ergodic theorems of von Neumann and Birkhoff. — *Martingales and the ergodic theorem of information theory*: Martingales. Information. — *Mixing*: Ergodicity. Weak-mixing. Strong-mixing. Markov and Bernoulli shifts. — *Entropy*: The isomorphism problem. Entropy as an invariant. The Pinsker  $\sigma$ -algebra. Rohlin-Sinai theorem. Zero entropy. — *Some examples*: Flows and changes in velocity. Winding numbers. Abolishing eigenvalues. Discrete spectrum with 'topological weak-mixing'. Minimality without unique ergodicity. Lebesgue spectrum from discrete spectrum. A weak-mixing transformation which is not strong-mixing. — *Spectral theory of unitary operators*: Two basic theorems. Spectral multiplicity theorems. Decompositions.

Lynn E. GARNER. — **An outline of projective geometry.** — Un vol. relié, 16 × 24, de vi, 220 p. — Prix: Dfl 85.00, outside U.S.A. and Canada, \$29.50 for U.S.A. and Canada. — Elsevier North-Holland, Inc., New York/Oxford, 1981.

*Incidence geometry*: Incidence structures. Planes. Algebraic examples. Isomorphism. Duality. Configurations. Subplanes. Further examples. — *Collineations*: Perspectivities. Projectivities. Collineations. Matrix-induced collineations on  $\pi_F$ . Central collineations. Central collineations on  $\pi_R$ . Automorphic collineations on  $\pi_F$ . — *Desarguesian and Pappian planes*: Desarguesian planes. Projectivities in Desarguesian planes. Coordinates in Desarguesian planes. Pappian planes. Cross ratio in  $\pi_F$ . — *Conics in Pappian planes*: The projective definition of a conic. Intersections of a range and a point conic. Conics in a closed plane  $\pi_F$ . Desargues's conic theorem. Pascal's theorem. Polarities. — *Metric projective geometry in  $\pi_C$* : Distance and angle in  $\pi_C$ . The triangle in  $\pi_C$ . Elliptic geometry. Hyperbolic geometry. Euclidean geometry. — *Projective spaces*: Projective spaces. Desargues's theorem and algebraic examples. Homomorphisms. — *Appendix*: Topics from linear and abstract algebra.

Auguste DICK. — **Emmy Noether: 1882-1935.** — Translated by H. I. Blocher. — Un vol. relié, 14 × 22, de xiv, 193 p. — Prix: FS 20.00. — Birkhäuser, Boston/Basel/Stuttgart, 1981.

Introduction. The Erlangen period (1882-1915). The Göttingen period (1915-1933). Bryn Mawr and Princeton (Fall 1933-Spring 1935). Obituaries of Emmy Noether by B. L. van der Waerden, Hermann Weyl, P. S. Alexandrov. Appendices: publications, obituaries, academic ranks and terms.

Philip J. DAVIS, Reuben HERSCH. — **The mathematical experience.** — With an introduction by Gian-Carlo Rota. — Un vol. relié, 17 × 24, de xix, 440 p. — Prix: FS 52.00. — Birkhäuser, Boston/Basel/Stuttgart, 1980.

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Zbigniew SEMADENI, Antoni WIWEGER. — **Einführung in die Theorie der Kategorien und Funktoren.** — Teubner-Texte zur Mathematik. — Un vol. broché, 15 × 21, de 320 p. — Prix: DM 29.00. — BSB B. G. Teubner Verlagsgesellschaft, Leipzig, 1979.

*Einführung in die Methode der Kategorientheorie*: Die kategoriale Denkweise. Kategorien von Abbildungen und Beispiele für Kategorien. Die allgemeine Definition der Kategorie. Präzisierung des Abbildungsbegriffes. Grosse und kleine Kategorien. Logische Grundlagen der Kategorientheorie. Unterkategorien. Weitere Beispiele von Kategorien. Diagramme. Gerichtete Graphen. Der Begriff des Funktors. Weitere Eigenschaften und Beispiele von Funktoren. Quasigeordnete Klassen. Diagramme als Funktoren. Konkrete Kategorien. Objektfreie Kategorien. Kategorien ohne Eindeutigkeit von Quelle und Ziel. — *Einfachste Begriffe der Kategorientheorie*: Isomorphismen. Monomorphismen, Epimorphismen, Retraktionen, Koretraktionen. Die duale Kategorie und das Dualitätsprinzip. Produkt von Kategorien. Funktoren mehrerer Veränderlicher. Automaten. Hauptfunktoren. Anfangsobjekte, Endobjekte und Nullobjekte. Faktorisierung von Morphismen. Einbettungen und Quotientenmorphismen in konkreten Kategorien. Separatoren und Koseparatoren. Injektive und projektive Objekte. *Probleme der eindeutigen Faktorisierung*: Allgemeines Schema: universelle Paare. Reflektoren und Quasireflektoren. Produkte und Koproducte. Freie Objekte. Differenzkerne und Differenzkokerne. Limes und Kolimes von Diagrammen. Vollständige Kategorien. Faserprodukte und Kofaserprodukte. Kernpaare. Direkte und inverse Limes. Tensorprodukte. Verschiedene Probleme. — *Natürliche Transformationen, darstellbare Funktoren und adjungierte Funktoren*: Natürliche Transformationen von Funktoren. Diagrammkategorie. Das Yoneda-Lemma und darstellbare Funktoren. Varianten des Yoneda-Lemmas. Kovariante adjungierte Funktoren. Kontravariante adjungierte Funktoren. Invariante Eigenschaften der darstellbaren und adjungierte Funktoren. Kriterien der Darstellbarkeit. Existenz adjungierter Funktoren. Quasi-isomorphe und quasi-duale Kategorien. Abgeschlossene Kategorien. Topoi. — *Monadern und algebraische Theorien*: Algebren als Mengen mit Operationen. Der Monadenbegriff. Eilenberg-Moore-Algebren. Vergleichender Eilenberg-Moore-Funktor. Kriterien der Monadizität. Gleichungsdefinierte Algebren. Kompakte

Räume als Algebren. Die Kleisli-Kategorie einer Monade. Linton-Algebren. Monaden endlichen Typs in *Ens*. Lawvere-Algebren. — *Additive und Abelsche Kategorien*: Kerne und Kokerne. Additive Kategorien. Biproducte. Abelsche Kategorien. Exakte Folgen. Additive Funktoren und exakte Funktoren. Abelsche Kategorien von Diagrammen. Diagramm-Lemmata für abelsche Kategorien. Kettenkomplexe und Homologieobjekte.

Meishe LEVIN, Jury GIRSHOVICH. — **Optimal quadrature formulas**. — Teubner-Texte zur Mathematik. — Un vol. broché, 15 × 21, de 122 p. — Prix: DM 13.00. — BSB B. G. Teubner Verlagsgesellschaft, Leipzig, 1979.

Monosplines and quadrature formulas. — One-dimensional optimal quadrature formulas. — Optimal quadrature formulas for periodic functions. — Optimal two-dimensional quadrature formulas. — Asymptotically optimal quadrature formulas.

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**Nonlinear analysis, function spaces and applications**. — Proceedings of a Spring school held in Horní Bradlo, 1978. — Edited by Svatopluk Fucik, Alois Kufner. — Teubner-Texte zur Mathematik. — Un vol. broché, 15 × 21, de 224 p. — Prix: DM 23.00. — BSB B. G. Teubner Verlagsgesellschaft, Leipzig, 1979.

*J. Camus*: On a class of weighted Sobolev spaces. — *Y. A. Dubinskii*: Some problems of the theory of Sobolev spaces of infinite order and of nonlinear equations. — *D. E. Edmunds*: Embeddings of Sobolev spaces. — *J. P. Gossez*: Orlicz-Sobolev spaces and nonlinear elliptic boundary value problems. — *K. Gröger*: Initial value problems for elastoplastic and elasto-viscoplastic systems. — *I. Hlavacek*: Some variational methods for nonlinear mechanics. — *H. Triebel*: Recent developments in the theory of function spaces and linear regular elliptic differential equations. — *E. Zeidler*: Lectures on Lyusternik-Schnirelman theory for indefinite nonlinear eigenvalue problems and its applications.

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— BSB B. G. Teubner Verlagsgesellschaft, Leipzig, 1980.

Über die Summierbarkeit der Funktionen aus dem Raum  $L_p^1(\Omega)$ ,  $p \geq 1$ . — Über  
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de 275 p. — Prix: FS 27.90. — Verlag Peter Lang A.G., Berne/Francfort sur le Main,  
1981.

*Analyse combinatoire*: Introduction et définitions générales. La fonction « factorielle  
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× 23,5, de XII, 144 p. — Prix: £12.50. — John Wiley and Sons, New York/Chichester/  
Brisbane/Toronto, 1981.

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Horwood series in mathematics and its applications. — Un vol. 15 × 23,5, de 261 p.  
— Prix: relié: £19.50, broché: £6.90. — Ellis Horwood Limited, Chichester and Halsted  
press: a division of John Wiley and Sons, New York/Chichester/Brisbane/Toronto, 1981.

*Occurrence and nature of waves*: Occurrence. Oscillation kinematics. Oscillator dy-  
namics. Forced oscillations. An analogous electric circuit. Normal modes of vibration.

Propagating waves. Stationary waves. Waves in three dimensions. Waves in stretched strings. The lossless transmission line. — *Solutions of the wave equation by integration*: The general solution. Wave energy. Characteristic impedance. Reflection at a boundary. Boundary between two media. Isolated load on a long string. Finite systems. Inhomogeneous boundary conditions. The inhomogeneous wave equation. — *The Fourier method of solution*: Outline. Fourier series. Examples of the Fourier method. The inhomogeneous equation. Inhomogeneous boundary conditions. Fourier integrals. — *The generalised Fourier method*: Non-uniform strings. The Sturm-Liouville problem. Small transverse vibrations of a suspended string. — *Dispersion*: Dispersive medium. Group velocity. Example: the elastically anchored string. Mature dispersion. Example: gravity-capillary water waves. Boundary value problems. The initial value problem. — *Discrete systems*: General introduction. A one-dimensional monatomic lattice. A diatomic lattice. Equivalent electric circuits. Finite lattices. Approach to a continuous system. — *The Fourier method in two dimensions*: The homogeneous wave equation. The inhomogeneous wave equation. The vibrating membrane. Free vibrations of a rectangular membrane. Free vibrations of a circular membrane. — *Sound waves in fluids*: Equations of fluid motion. Linearisation of the equations. Waves in tubes. Cylindrical waves. Spherical waves. Diffraction. Scattering. — *Electromagnetic waves*: The electromagnetic field. The wave equation. Reflection and transmission at a plane boundary. Wave guides. — *Water waves*: Equations of liquid motion under gravity. Linearisation of the boundary conditions. One-dimensional waves on a horizontal bed. Particular one-dimensional flows. Gravity waves on the interface of two liquids. — *Theory of hyperbolic equations*: The Cauchy problem. General solution of first order equations. The Cauchy problem for first order equations. Canonical forms of second order equations. The Cauchy problem for second order equations. — *The Cauchy problem in two and three dimensions*: The initial value problem in three dimensions. The initial value problem in two dimensions. Huyghens's principle. The inhomogeneous wave equation. A uniqueness theorem for the Cauchy problem. — *Appendix: special functions*: The gamma function. Bessel functions. Legendre functions.

William T. REID. — **Sturmian theory for ordinary differential equations**. — Applied mathematical sciences, vol. 31. — Un vol. broché, 15,5 × 23,5, de xv, 559 p. — Prix: DM 54.00. Springer-Verlag, New York/Heidelberg/Berlin, 1980.

*Historical prologue*: Methods based upon variational principles. Historical comments on terminology. — *Sturmian theory for real linear homogeneous second order ordinary differential equations on a compact interval*: Preliminary properties of solutions. The classical oscillation and comparison theorems of Sturm. Related oscillation and comparison theorems. Sturmian differential systems. Polar coordinate transformations. Transformations for differential equations and systems. Variational properties of solutions. Comparison theorems. Morse fundamental quadratic forms for conjugate and focal points. Survey of recent literature. — *Self-adjoint boundary problems associated with second order linear differential equations*: A canonical form for boundary conditions. Extremum problems for self-adjoint systems. Comparison theorems. Comments on recent literature. — *Oscillation theory on a non-compact interval*: Integral criteria for oscillation and non-oscillation. Principal solutions. Theory of singular quadratic functionals. Interrelations between oscillation criteria and boundary problems. Strong and conditional oscillation. A class of Sturmian problems on a non-compact interval. — *Sturmian theory for differential systems*: Special examples. Preliminary properties of solutions. Associated Riccati matrix differential equations. Normality and abnormality. Variational properties of solutions. Comparison theorems. Morse fundamental Hermitian

forms. Generalized polar coordinate transformations for matrix differential systems. Matrix oscillation theory. Principal solutions. Comments on systems which are not identically normal. Comments on the literature on oscillation theory for Hamiltonian systems. Higher order differential equations. — *Self-adjoint boundary problems*: Normality and abnormality of boundary problems. Self-adjoint boundary problems associated with  $(\mathcal{B})$ . Comparison theorems. Treatment of self-adjoint boundary problems by matrix oscillation theory. Notes and comments on the literature. — *A class of definite boundary problems*: Definitely self-adjoint boundary problems. Comments on related literature. — *Generalizations of Sturmian theory*: Integro-differential boundary problems. A class of generalized differential equations. Hestenes quadratic form theory in a Hilbert space. The Weinstein method of intermediate problems. Oscillation phenomena for Hamiltonian systems in a  $B^*$ -algebra. Topological interpretations of the Sturmian theorems. — Exercices à la fin de chaque chapitre.

Jean DIEUDONNÉ. — **Choix d'œuvres mathématiques**. — Deux vol. reliés,  $17,5 \times 24$ , de 1208 p. — Prix: FF 490.00. — Hermann, Paris, 1981.

*Divers*: Allocution prononcée à Nice le 20 novembre 1969. L'abstraction et l'intuition mathématiques. Introduction à l'« Abrégé d'histoire des mathématiques ». La philosophie des mathématiques de Bourbaki. L'évolution de la pensée mathématique dans la Grèce ancienne. Liberté et science moderne. — *Analyse classique*: Sur les points singuliers des intégrales de certaines équations différentielles. L'aspect qualitatif de la théorie analytique des polynômes. Quelques résultats quantitatifs de théorie analytique des polynômes. Dérivées et différences des fonctions de variables réelles. Sur la convergence des approximations successives. Sur le polygone de Newton. Deux exemples singuliers d'équations différentielles. Sur un théorème de Glaeser. — *Topologie*: Sur les fonctions continues numériques définies dans un produit de deux espaces compacts. Sur les espaces uniformes complets. Un exemple d'espace normal non susceptible d'une structure uniforme d'espace complet. Sur les espaces topologiques susceptibles d'être munis d'une structure uniforme d'espace complet. Une généralisation des espaces compacts. Sur les fonctions continues  $p$ -adiques. Sur les groupes abéliens localement compacts. Sur la complétion des groupes topologiques. Sur les corps topologiques connexes. Sur un espace localement compact non métrisable. On topological groups of homeomorphisms. Un critère de normalité pour les espaces produits. — *Espaces vectoriels topologiques*: Sur le théorème de Hahn-Banach. La dualité dans les espaces vectoriels topologiques. Sur les homomorphismes d'espaces normés. Sur l'anneau des endomorphismes continus d'un espace normé. Sur la séparation des ensembles convexes dans un espace de Banach. Natural homomorphisms in Banach spaces. La dualité dans les espaces  $(F)$  et  $(LF)$ . Matrices semi-finies et espaces localement linéairement compacts. Complex structures on real Banach spaces. Sur les propriétés de permanence de certains espaces vectoriels topologiques. Sur les espaces de Montel métrisables. Bounded sets in  $(F)$  spaces. Denumerability conditions in locally convex vector spaces. Sur la séparation des ensembles convexes. — *Intégration*: Sur un théorème de Jessen. Sur la convergence des suites de mesures de Radon. Addition à mon article « Sur la convergence des suites de mesures de Radon ». Sur le produit de composition. Sur la bicommutante d'une algèbre d'opérateurs. Champs de vecteurs non localement triviaux. Sur le produit de composition (II). Sur une propriété des groupes libres. Quasi-hermitian operators. Sur les produits de mesures. — *Algèbre et théorie des groupes*: Sur un problème d'égalité répartition modulo 1. Sur la théorie de la divisibilité. Sur les systèmes hypercomplexes. Sur le socle d'un anneau et les anneaux simples infinis. Sur le nombre de dimensions d'un module. Les déterminants sur un corps non commutatif. Sur la réduction canonique des couples de matrices. Sur les corps ordonnables.

Sur les extensions transcendentes séparables. Sur les produits tensoriels. La théorie de Galois des anneaux simples et semi-simples. Sur les systèmes d'involutions conjuguées et permutables dans les groupes projectifs. Linearly compact spaces and double vector spaces over fields. Algebraic homogeneous spaces over fields of characteristic two. Semi-dérivations et formule de Taylor en caractéristique  $p$ . On the orthogonal groups over the rational field. Sur les groupes orthogonaux rationnels à trois et quatre variables. Orthogonal and unitary groups over the rational field. Les idéaux minimaux dans les anneaux associatifs. Sur les  $p$ -groupes abéliens infinis. On the orthogonal groups over an algebraic number field. On the structure of unitary groups. Les extensions quadratiques des corps non commutatifs et leurs applications. On the structure of unitary groups (II). Sur les groupes unitaires quaternioniques à deux et trois variables. Les isomorphismes exceptionnels entre les groupes classiques finis. Sur les multiplicateurs des similitudes. Pseudo-discriminant and Dickson invariant. Sur les générateurs des groupes classiques. Sur la représentation paramétrique de Cayley. Remarks on quasi-Frobenius rings. — *Théorie des groupes formels* : Sur les groupes de Lie algébriques sur un corps de caractéristique  $p > 0$ . On semi-simple Lie algebras. Groupes de Lie et hyperalgèbres de Lie sur un corps de caractéristique  $p > 0$ . Lie groups and Lie hyperalgebras over a field of characteristic  $p > 0$  (II). Groupes de Lie et hyperalgèbres de Lie et hyperalgèbres de Lie sur un corps de caractéristique  $p > 0$  (III). Lie groups and Lie hyperalgebras over a field of characteristic  $p > 0$  (IV). Groupes de Lie et hyperalgèbres de Lie sur un corps de caractéristique  $p > 0$  (V). On the Artin-Hasse exponential series. Lie groups and Lie hyperalgebras over a field of characteristic  $p > 0$  (VIII). Remarques sur la réduction mod.  $p$  des groupes linéaires algébriques. Introduction à l'« Algèbre linéaire ». Préface au « Calcul infinitésimal ». Notice sur les travaux scientifiques.

Robert J. ADLER. — **The geometry of random fields.** — Wiley series in probability and mathematical statistics. — Un vol. relié,  $16 \times 23,5$ , de xi, 280 p. — Prix: £17.50. — John Wiley & Sons, Chichester/New York/Brisbane/Toronto, 1981.

*Random fields and excursion sets* : Introduction. Basic probability. Expectation. Stochastic convergence. Random fields. Gaussian fields. Some simple aspects of random fields. — *Homogeneous fields and their spectra* : The mean and covariance functions. Continuity and differentiability of random fields. Stochastic integration. The spectral representation theorem. Isotropic fields. — *Sample function regularity* : Suitably regular functions. Sufficient conditions for regularity. The Karhunen-Loève expansion and continuity. Simple conditions for continuity in the Gaussian case. — *Geometry and excursion characteristics* : The one-dimensional theory. Integral geometry and the IG characteristic  $\Gamma$ . A point set representation for  $\Gamma$ . Differential topology and the characteristic  $\chi$ . Some properties of  $\chi$  and  $\Gamma$ . — *Some expectations* : A general result. An expression for the mean value of  $\chi$ . An evaluation of the mean value of  $\chi$ . The mean value of the IG characteristic when  $N = 2$ . An estimation and interpolation problem. — *Local maxima and high-level excursions* : The mean number of maxima. The isotropic case. The mean number of maxima above high levels. Excursion characteristics above high levels. Excursion characteristics above high levels. Ergodicity. Point processes. The local structure of high maxima. The local structure of excursions above high levels. On the global maximum. — *Some non-Gaussian fields* : The  $\chi^2$  field. Some further spectral theory. The envelope of a homogeneous field. — *Sample function erraticism and Hausdorff dimension* : Hausdorff dimension. Some useful lemmas. Index- $\beta$  Gaussian fields. Index- $\beta$  fields and Hausdorff dimension. An example related to suitable regularity. Local time. Local time, erraticism, and dimension. The Gaussian case. The Brownian motions. — *The Markov property for Gaussian fields.*