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Telegraphic Reviews

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# TELEGRAPHIC REVIEWS

Edited by **Arnold Ostebee and Paul Zorn**

with the assistance of the Mathematics Departments of  
Carleton, Macalester, and St. Olaf Colleges

Telegraphic Reviews are designed to alert readers in a timely manner to new books and computer software appropriate to mathematics teaching and research. Special codes classify reviews by subject area and appropriate use:

|                                  |                                  |                       |
|----------------------------------|----------------------------------|-----------------------|
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| <i>C</i> : Computer Software     | <i>L</i> : Undergraduate Library | ** : Special Emphasis |
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Books and software submitted for review should be sent to *Book Reviews Editor, American Mathematical Monthly, St. Olaf College, 1520 St. Olaf Avenue, Northfield, MN 55057-1098.*

**General, S(15–16).** *Der Goldene Schnitt.* Hans Walser. BG Teubner Leipzig, 1993, 140 pp, DM 16,80 (P). [ISBN 3-8154-2070-9] The golden mean as it appears in geometry and other areas (e.g., fractals, number sequences, probability). JD-B

**General, S\*(13–16), L\*\*.** *Newton's Clock: Chaos in the Solar System.* Ivars Peterson. WH Freeman, 1993, xiii + 317 pp, \$22.95. [ISBN 0-7167-2396-4] An inviting history of celestial mechanics from antiquity (e.g., navigational star charts) to present (e.g., chaos vs. stability in the solar system). Informal but informative, learned but readable. PZ

**General, S(15).** *Mathematik für Wirtschaftswissenschaftler.* Volker Nollau. BG Teubner Leipzig, 1993, 260 pp, DM 29,80 (P). [ISBN 3-8154-2046-6] An introduction to mathematics germane economics. Set theory, propositional calculus, number systems, linear algebra and optimization, sequences and series, calculus, linear difference and differential equations, probability, random variables, probability distributions. JD-B

**General, T(13–16), S\*\*\*, P, L\*\*.** *The USSR Olympiad Problem Book: Selected Problems and Theorems of Elementary Mathematics.* D.O. Shklarsky, N.N. Chentzov, I.M. Yaglom. Transl: John Maykovich. Dover, 1993, xvi + 452 pp, \$10.95 (P). [ISBN 0-486-27709-7] Unabridged republication of the 1962 W.H. Freeman edition—among best problem collections ever. 320 challenging problems with unusually complete and instructive solutions. A real bargain. LCL

**Finite Mathematics, T(13: 1).** *Finite Mathematics, Second Edition.* Stanley I. Grossman. Wm C Brown, 1993, xviii + 685 pp, \$60.63. [ISBN 0-697-11351-5] Standard topics: sets, linear algebra, linear programming, counting, probability, statistics, Markov chains, finance. Many carefully worked examples; applications to business, biology. Uses real data. (1983 Wadsworth text, TR, October 1983.) TH

**Education, P.** *Advances in Instructional Psychology, Volume 4.* Ed: Robert Glaser. Lawrence Erlbaum Assoc, 1993, xi + 347 pp, \$79.95. [ISBN 0-8058-0709-8] Reports on research on reasoning and problem solving as fundamental components of learning and teaching. Two chapters focus on mathematics. MW

**Education, P.** *Handbook of Individual Differences, Learning, and Instruction.* David H. Jonassen, Barbara L. Grabowski. Lawrence Erlbaum Assoc, 1993, xvii + 488 pp, \$34.50 (P); \$99.95. [ISBN 0-8058-1413-2; 0-8058-1412-4]

**Education, P.** *Schools for Thought: A Science of Learning in the Classroom.* John T. Bruer. MIT Pr, 1993, x + 324 pp, \$29.95. [ISBN 0-262-02352-0] Clear introduction to cognitive science, with persuasive arguments for its importance in educational reform. Summaries of representative research programs, examples of specific applications, implications for teacher education. Not specifically mathematical, but good general overview. MW

**Education, P.** *How to Start an Industrial Mathematics Program in the University.* Avner Friedman, John Lavery. SIAM, 1993, v + 37 pp, free (P). [ISBN 0-89871-327-7] For depart-

ments considering creating a graduate industrial mathematics program; based on experiences of the Institute for Mathematics and its Applications at the University of Minnesota. SM

**History, L.** *A History of Mathematical Notations: Two Volumes Bound as One.* Florian Cajori. Dover, 1993, \$19.95 (P). [ISBN 0-486-67766-4] *V. I: Notations in Elementary Mathematics*, xvi + 451 pp; *V. II: Notations Mainly in Higher Mathematics*, xii + 367 pp. For each symbol, details first appearance, origins, spread, and competition. Entertaining, interesting, good browsing. LC

**Logic, P.** *Complexity of Proofs and Their Transformations in Axiomatic Theories.* V.P. Orevkov. Transl. of Math. Mono., V. 128. AMS, 1993, vi + 153 pp, \$86. [ISBN 0-8218-4576-4]

**Logic, P.** *The Reconstruction of Trees from Their Automorphism Groups.* Matatyahu Rubin. Contemp. Math., V. 151. AMS, 1993, viii + 274 pp, \$56 (P). [ISBN 0-8218-5187-X]

**Combinatorics, P.** *Surveys in Combinatorics, 1993.* Ed: Keith Walker. London Math. Soc. Lect. Note Ser., V. 187. Cambridge Univ Pr, 1993, vii + 287 pp, \$39.95 (P). [ISBN 0-521-44857-3] 9 survey papers from the 14th British Combinatorial Conference (July 1993).

**Discrete Mathematics, T(14–15: 1, 2).** *Discrete Mathematics with Applications.* H.F. Mattson, Jr. Wiley, 1993, xxv + 637 pp, \$61.95. [ISBN 0-471-60672-3] Opening chapters on sets, logic, induction, equivalence relations and partitions, functions. Then a tree of possibilities: integers, congruences, binomial theorem, counting, probability, recurrence, matrices, trees, graphs. Conversational style, pleasing design. Many examples, problems of all kinds. Less algorithmic than other texts. LCL

**Discrete Mathematics, T(16–17: 1), P\*, L.** *generatingfunctionology, Second Edition.* Herbert S. Wilf. Academic Pr, 1994, ix + 228 pp, \$44.95. [ISBN 0-12-751956-4] Excellent introduction to theory and techniques of generating functions. *Second Edition* has more problems, new applications, appendix on using Mathematica and Maple. (*First Edition*, TR and Extended Review, November 1990.) TH

**Number Theory, T(16).** *Primes and Programming: An Introduction to Number Theory with Computing.* Peter Giblin. Cambridge Univ Pr, 1993, x + 239 pp, \$44.95; \$19.95 (P). [ISBN 0-521-40182-8; 0-521-40988-8] An interesting, sophisticated introduction to number theory. Several Pascal programs, and many valuable computing exercises. Covers primes, congruences, pseudoprimes, cryptography, primitive

roots, divisors, continued fractions, quadratic residues. Have a look. SG

**Number Theory, P.** *Arithmetic of Quadratic Forms.* Yoshiyuki Kitaoka. Tracts in Math., V. 106. Cambridge Univ Pr, 1993, x + 268 pp, \$54.95. [ISBN 0-521-40475-4] A basic overview. After a general introduction to quadratic forms, systematically treats forms over the reals, rational local fields,  $p$ -adic integers, and the integers. A few exercises. SG

**Linear Algebra, T(13–15: 1), L.** *Linear Algebra: An Introduction to the Theory and Use of Vectors and Matrices.* Alan Tucker. Macmillan, 1993, xiii + 440 pp. [ISBN 0-02-421581-3] A new, refreshing look at elementary linear algebra. Reflects recent ideas on curricular reform and applications. Standard topics are enhanced by attractive examples, presentation. Scalar product, orthogonality are used systematically for matrix operations; eigenvalues, eigenvectors are introduced early. Well-selected exercises. JS

**Algebra, T(13–14: 1), L.** *Classical Algebra, Third Edition.* William J. Gilbert, Scott A. Vanstone. Waterloo Math Found (U. of Waterloo, Waterloo, Ontario, Canada N2L 3G1), 1993, vii + 248 pp, (P). [ISBN 0-921418-92-2] A curious, interesting, unusual book. Preparation for college-level modern algebra: elementary number theory, congruences, binomial theorem, permutation groups, cryptography, complex numbers, fundamental theorem of algebra (with intuitive topological proof), polynomial equations over finite and infinite fields. JS

**Algebra, S(18), P.** *Basic Structures of Modern Algebra.* Yuri Bahturin. Math. & Its Applic., V. 265. Kluwer Academic, 1993, ix + 419 pp, \$182. [ISBN 0-7923-2459-5] Best suited for expert reference; too terse, fast-paced for use as a beginning text. Topics include Galois theory, normed fields, simple groups, topological groups, Noetherian rings, central simple algebras, Lie algebras, homological algebras, algebraic groups, varieties of algebras. No examples or exercises. JS

**Algebra, T(18).** *Squares.* A.R. Rajwade. London Math. Soc. Lect. Note Ser., V. 171. Cambridge Univ Pr, 1993, xii + 286 pp, \$39.95 (P). [ISBN 0-521-42668-5] A well-written, unpretentious introduction to squares and sums of squares in fields. Among topics considered: the state of a field, Hilbert's 17th problem, Pfister forms, formally real fields. Some exercises. SG

**Algebra, T\*\*(17: 2), P, L.** *Algebra: A Graduate Course.* I. Martin Isaacs. Brooks/Cole, 1994, xii + 516 pp, \$67.50. [ISBN 0-534-19002-2] A delicious, beautiful, infectiously

enthusiastic treatment of noncommutative and commutative algebra. Classical approach (no tensor products, categories), but includes modern topics. Nice examples, problems. RM

**Algebra, T(16–17).** *Finite Fields: Structure and Arithmetics.* Dieter Jungnickel. Bibliographisches Institut & FA Brockhaus, 1993, 339 pp, DM 78. [ISBN 3-411-16111-6] Explicit constructions, normal and dual bases, shift register sequences, characters and Gauss sums. Interesting commentaries; no exercises. SG

**Algebra, P.** *Computational Algebraic Geometry and Commutative Algebra.* Eds: David Eisenbud, Lorenzo Robbiano. Symp. Mathematica, V. XXXIV. Cambridge Univ Pr, 1993, x + 298 pp, \$49.95. [ISBN 0-521-44218-4] Papers from 1991 conference in Cortona on computational aspects of Gröbner bases. Includes tutorials, research surveys, open problems. RM

**Algebra, T(18: 1, 2), P.** *Quadratic Algebras, Clifford Algebras, and Arithmetic Witt Groups.* Alexander J. Hahn. Universitext. Springer-Verlag, 1994, xi + 286 pp, \$34 (P). [ISBN 0-387-94110-X] Main themes: algebras and forms over a commutative ring, involutions on algebras, gradings and tensor products, separable algebras. New results on representations of Clifford algebras, structure of the Arf algebra and the quadratic Witt group, connections between the group of quadratic algebras and the discriminant group. TH

**Algebra, T\*\*(18: 1), P\*.** *Hopf Algebras and Their Actions on Rings.* Susan Montgomery. CBMS Reg. Conf. Ser. in Math., No. 82. AMS, 1993, xiv + 238 pp, \$32 (P). [ISBN 0-8218-0738-2] Recent results on algebraic structure of Hopf algebras, their actions and coactions. Unifies theories of group, Lie algebra, and graded algebra actions. Provides an accessible introduction to quantum groups. TH

**Calculus, T(13).** *Calculus with Analytic Geometry.* Joe Repka. Wm C Brown, 1994, xxii + 1321 pp, \$75.40. [ISBN 0-697-06918-4] Not a lean book. Similar in coverage and emphasis to standard texts of the last 15 years. Readers may find the pages busy rather than lively: 4-color displays showing calculator keystrokes; historical asides; lots of colored graphics; 3-level problem sets with starred problems; calculator problems; and sometimes a “Point to Ponder.” AWR

**Calculus, P.** *Differentialrechnung für Funktionen mit mehreren Variablen.* Klaus Harbarth, Thomas Riedrich, Winfried Schirotzek. BG Teubner Leipzig, 1993, 198 pp, DM 22,80 (P). [ISBN 3-8154-2041-5]

**Calculus, P.** *Integralrechnung für Funktionen*

*mit mehreren Variablen.* Karl-Heinz Körber, Ernst-Adam Pforr. BG Teubner Leipzig, 1993, 199 pp, DM 22,80 (P). [ISBN 3-8154-2042-3]

**Calculus, T(13: 3, 4).** *Applied Calculus, Second Edition.* Stanley I. Grossman. Wm C Brown, 1993, xix + 856 pp, \$61.26. [ISBN 0-697-11350-7] Introduction to calculus stressing applications to business, economics, social sciences, biology. Many solved examples, realistic applications, historical notes. KB

**Calculus, C.** *Insight: Demonstration Software for Calculus and Analytic Geometry, Eighth Edition, by Thomas and Finney.* IntelliPro. Addison-Wesley, 1992, iii + 6 pp, (P) with PC disk. [ISBN 0-201-90897-2] Graphics mostly well done. Good animation, but resolution is limited; some  $\varepsilon$ - $\delta$  pictures are hard to decipher. Many examples prompt user for parameter values, allowing experiments. Best used in careful coordination with classroom work. SM

**Calculus, P.** *Differential- und Integralrechnung für Funktionen mit einer Variablen.* Ernst-Adam Pforr, Winfried Schirotzek. BG Teubner Leipzig, 1993, 302 pp, DM 28,80 (P). [ISBN 3-8154-2040-7]

**Real Analysis, T(18).** *Measure Theory.* J.L. Doob. Grad. Texts in Math., V. 143. Springer-Verlag, 1994, xii + 210 pp, \$49. [ISBN 0-387-94055-3] A concise exposition. Measure spaces and measurable functions, integration and Hilbert space, measure sequences and signed measures, functions of bounded variation and Martingale theory. Probability notions are kept consistently before reader. No exercises (except to supply some missing proofs). AWR

**Differential Equations, P.** *Asymptotic Analysis: Linear Ordinary Differential Equations.* Mikhail V. Fedoryuk. Transl: Andrew Rodick. Springer-Verlag, 1993, viii + 363 pp, \$129. [ISBN 0-387-54810-6] Translation of 1983 Russian original. A comprehensive reference for asymptotic methods. SK

**Differential Equations, T(18), P.** *Introduction to Functional Differential Equations.* Jack K. Hale, Sjoerd M. Verduyn Lunel. Appl. Math. Sci., V. 99. Springer-Verlag, 1993, x + 447 pp, \$49. [ISBN 0-387-94076-6] Lively, thoughtful introduction. Motivates theory with applications (historical and recent), and the promise of a rich mathematical structure. Emphasizes dynamics, equations that depend on “past history.” Well-written; extensive bibliography. MLR

**Dynamical Systems, T(15–18: 1), S, L.** *Fractals Everywhere, Second Edition.* Michael F. Barnsley. Academic Pr, 1993, xiv + 531 pp, \$49.95. [ISBN 0-12-079061-0] New features

include extensive exercise solutions, some new problems. A heady mix of analysis, geometry, dynamics, and computing, forcefully expository and vividly illustrated. (*First Edition*, TR, April 1989; Extended Review, March 1990.) PZ

**Numerical Analysis, T(16–17: 1), L.** *Iterative Solution of Large Sparse Systems of Equations*. Wolfgang Hackbusch. Appl. Math. Sci., V. 95. Springer-Verlag, 1994, xxi + 429 pp, \$59. [ISBN 0-387-94064-2] Slightly revised translation from German. Treats Gauss-Seidel, conjugate gradient, multigrid, and domain decomposition methods. Examples from numerical PDE's. SM

**Numerical Analysis, P.** *Moving-grid Methods for Time-dependent Partial Differential Equations*. P.A. Zegeling. CWI Tract, V. 94. Centrum voor Wiskunde en Informatica, 1993, 168 pp, Dfl. 50 (P). [ISBN 90-6196-424-5]

**Numerical Analysis, P, L.** *Templates for the Solution of Linear Systems: Building Blocks for Iterative Methods*. Richard Barrett, et al. SIAM, 1994, xiii + 112 pp, \$18 (P). [ISBN 0-89871-328-5] Provides templates (pseudocode descriptions of algorithms) to help with choice and implementation of methods effective on high-performance computers. AO

**Numerical Analysis, P.** *Numerical Methods for the Three-dimensional Shallow Water Equations on Supercomputers*. E.D. de Goede. CWI Tract, V. 88. Centrum voor Wiskunde en Informatica, 1993, 124 pp, Dfl. 40 (P). [ISBN 90-6196-417-2]

**Numerical Analysis, P.** *Numerical Linear Algebra*. Eds: Lothar Reichel, Arden Ruttan, Richard S. Varga. Walter de Gruyter, 1993, ix + 199 pp, DM 168. [ISBN 3-11-013784-4] Proceedings of a 1992 conference at Kent State University.

**Operator Theory, T?(16–17: 1, 2), S, P.** *Theory of Linear Operators in Hilbert Space: Two Volumes Bound As One*. N.I. Akhiezer, I.M. Glazman. Transl: Merlynd Nestell. Dover, 1993, xi + 218 pp, \$9.95 (P). [ISBN 0-486-67748-6] Unaltered republication of 1961 and 1963 editions. Bounded and unbounded operators; spectral analysis of completely continuous, unitary, and self-adjoint operators; extensions of symmetric operators. Appendices on differential operators and Naimark-Krein theory of generalized extensions of symmetric operators. No exercises. HD

**Functional Analysis, P.** *Evolutionary Integral Equations and Applications*. Jan Prüss. Mono. in Math., V. 87. Birkhäuser, 1993, xxvi + 366 pp, \$139. [ISBN 0-8176-2876-2]

**Functional Analysis, P.** *A Topological Introduction to Nonlinear Analysis*. Robert F. Brown. Birkhäuser, 1993, viii + 146 pp, \$24.50 (P). [ISBN 0-8176-3706-0] Topological approach to Krasnoselski-Rabinowitz bifurcation theorem and its application to Euler buckling of columns. SK

**Functional Analysis, P.** *Problèmes d'Analyse Fonctionnelle et d'Analyse Harmonique*. M. Samuelides, L. Touzillier. Cépaduès-Éditions, 1993, vi + 391 pp. [ISBN 2-85428-257-4]

**Analysis, P.** *Recent Advances in Wavelet Analysis*. Eds: Larry L. Schumaker, Glenn Webb. Wavelet Analysis & Its Applic., V. 3. Academic Pr, 1994, xi + 364 pp. [ISBN 0-12-632370-4] Ten papers on theoretical and practical applications of wavelet analysis.

**Analysis, T\*\*(15–17: 2), S\*\*, L\*\*.** *Advanced Calculus: A Differential Forms Approach*. Harold M. Edwards. Birkhäuser, 1994, xv + 508 pp, \$49.50. [ISBN 0-8176-3707-9] An inviting, unusual, high-level introduction to vector calculus, based solidly on differential forms. Superb exposition: informal but sophisticated, down-to-earth but general, geometrically and physically intuitive but mathematically rigorous, entertaining but serious. Remarkably diverse applications, physical and mathematical. Still fresh and novel at age 25. (1969 original edition, TR, October 1969; 1980 edition, TR, March 1981; Extended Review, March and December 1982.) PZ

**Analysis, S(15–18), P, L.** *Exercises for Fourier Analysis*. T.W. Körner. Cambridge Univ Pr, 1993, x + 385 pp, \$54.95; \$22.95 (P). [ISBN 0-521-43276-6; 0-521-43849-7] Chapter by chapter exercises for the author's splendid *Fourier Analysis* (TR, May 1990). KS

**Analysis, T(17), S, P, L.** *Wavelets: An Elementary Treatment of Theory and Applications*. Ed: Tom H. Koornwinder. Ser. in Approx. & Decompositions, V. 1. World Scientific, 1993, xii + 225 pp, \$48. [ISBN 981-02-1388-3] 12 papers from a 4-day course at CWI, Amsterdam. First 6 form nice introduction to (affine) wavelet theory; others treat applications, special aspects. KS

**Algebraic Geometry, P.** *Computational Algebraic Geometry*. Eds: Frédéric Eysssette, André Galligo. Progress in Math., V. 109. Birkhäuser, 1993, ix + 328 pp, \$64.50. [ISBN 0-8176-3678-1] 21 papers from the MEGA-92 symposium held in Nice, France.

**Algebraic Geometry, P.** *Cohomological Methods in Transformation Groups*. C. All-day, V. Puppe. Stud. in Adv. Math., V. 32.

Cambridge Univ Pr, 1993, xi + 470 pp, \$69.95. [ISBN 0-521-35022-0]

**Algebraic Geometry, P.** *Queen's Lectures on Arithmetical Composition of Quadratic Forms.* Anatolii N. Andrianov. Papers in Pure & Appl. Math., V. 92. Queen Univ, 1992, ii + 62 pp, (P). [ISBN 0-88911-634-2]

**Geometry, T(15-16: 1, 2), L.** *Modern Geometries, Fourth Edition.* James R. Smart. Brooks/Cole, 1993, xiii + 410 pp, \$51.50. [ISBN 0-534-21198-4] New edition has more examples and figures, short section on fractals, stronger bibliography, and more historical notes. (*First Edition*, TR, November 1973; Extended Review, August-September 1974.) DP

**Algebraic Topology, P.** *Morse Homology.* Matthias Schwarz. Progress in Math., V. 111. Birkhäuser, 1993, ix + 235 pp, \$49.50. [ISBN 0-8176-2904-1]

**Algebraic Topology, P.** *Nielsen Theory and Dynamical Systems.* Ed: Christopher K. McCord. Contemp. Math., V. 152. AMS, 1993, xii + 350 pp, \$52 (P). [ISBN 0-8218-5181-0] Proceedings of the 1992 AMS-IMS-SIAM Joint Summer Research Conference held at Mt. Holyoke College.

**Topology, T(15-16: 1).** *Topology of Surfaces.* L. Christine Kinsey. Undergrad. Texts in Math. Springer-Verlag, 1993, viii + 262 pp, \$39. [ISBN 0-387-94102-9] Choice of topics is "fairly random:" about equal parts point-set, combinatorial, and algebraic topology. SK

**Topology, P\*, L.** *Knot Theory.* Charles Livingston. Carus Math. Mono., V. 24. MAA, 1993, xviii + 240 pp, \$31.50. [ISBN 0-88385-027-3] A lively exposition; requires only basic linear algebra. Covers (1) history and foundations of knot theory; (2) advanced topics: symmetry, Alexander polynomials, numerical invariants; (3) recent advances: the Conway, Jones, and Kauffman polynomials. TH

**Operations Research, S(15-17), C, L.** *Exploring Interior-Point Linear Programming: Algorithms and Software.* Ami Arbel. Found. of Comp. Ser. MIT Pr, 1993, xxiv + 211 pp, \$35 (P), with disk. [ISBN 0-262-51073-1] Treats 3 interior-point linear programming methods: primal affine scaling, dual affine scaling, and primal-dual methods. With excellent demonstration software (DOS) for problems with up to 100 constraints. No exercises. SM

**Optimization, P, L.** *Optimization Software Guide.* Jorge J. Moré, Stephen J. Wright. Frontiers in Appl. Math., V. 14. SIAM, 1993, xii + 154 pp, \$24.50 (P). [ISBN 0-89871-322-6] Notes for 1992 SIAM annual meeting short course. First part overviews al-

gorithms for different classes of optimization problems. Second part contains brief product descriptions from software vendors, individual researchers. AO

**Optimization, T(18: 2), L.** *Optima and Equilibria: An Introduction to Nonlinear Analysis.* Jean-Pierre Aubin. Grad. Texts in Math., V. 140. Springer-Verlag, 1993, xvi + 417 pp, \$59. [ISBN 0-387-52121-6] Convex optimization, 2- and  $n$ -person noncooperative games, cooperative games, nonlinear equations, variational inequalities, economic equilibria. Many exercises. Fully rigorous. SM

**Mathematical Modeling, S(15-16).** *Heureka heute: Kostproben praxiswirksamer Mathematik.* Günter Dewess, et al. BG Teubner Leipzig, 1993, 150 pp, DM 16,80 (P). [ISBN 3-8154-2071-7] Intended for a lay audience, but assumes a fair amount of mathematics. Each chapter treats a problem from real life (e.g., producing a chemical, routing coal trains, boring non-round holes). JD-B

**Mathematical Modeling, T(13: 2), L.** *Game Theory and Strategy.* Philip D. Straffin. New Math. Lib., V. 36. MAA, 1993, x + 244 pp, \$27.50 (P). [ISBN 0-88385-637-9] In-depth treatment of game theory. Assumes only high school algebra, but builds mathematical sophistication and familiarity with mathematical modeling process. Chapters on theory alternate with chapters on applications to anthropology, social psychology, economics, politics, business, biology, philosophy. Many exercises. KB

**Control Theory, T?(17: 1), P.** *Direct Adaptive Control Algorithms: Theory and Applications.* Howard Kaufman, Izhak Bar-Kana, Kenneth Sobel. Communications & Control Eng. Ser. Springer-Verlag, 1994, xxiii + 370 pp, \$69. [ISBN 0-387-94155-X] Theory and practice of adaptive control algorithms for multiple input/output control systems with parameter uncertainty. Applications include flexible structure control, drug infusion, robotics. RM

**Control Theory, P.** *Representation and Control of Infinite Dimensional Systems, Volume II.* Alain Bensoussan, et al. Systems & Control: Found. & Applic. Birkhäuser, 1993, xviii + 343 pp, \$79.50. [ISBN 0-8176-3642-0] Theory of quadratic cost optimal control for a large class of infinite-dimensional systems. JO

**Control Theory, P.** *Lecture Notes in Control and Information Sciences-189: Non-Identifier-Based High-Gain Adaptive Control.* Achim Ilchmann. Springer-Verlag, 1993, x + 204 pp, \$54 (P). [ISBN 0-387-19845-8]

**Probability, P.** *Ten Lectures on the Probabilistic Method, Second Edition.* Joel Spencer.

CBMS-NSF Reg. Conf. Ser. in Appl. Math., V. 64. SIAM, 1994, vi + 88 pp, \$18.50 (P). [ISBN 0-89871-325-0] Based on lectures given at 1986 CBMS-NSF conference held at Fort Lewis College. This edition contains new results, additional material. (*First Edition*, TR, December 1988.) LC

**Mathematical Statistics, P.** *Efficient and Adaptive Estimation for Semiparametric Models.* Peter J. Bickel, et al. Ser. in Math. Sci. Johns Hopkins Univ Pr, 1993, xix + 560 pp, \$95. [ISBN 0-8018-4541-6] Asymptotic inference for finite-dimensional parametric models, with extensions to semiparametric models. Information bounds for infinite-dimensional parameters, construction of estimates. Limited results on general methods for constructing asymptotically efficient estimates. RWJ

**Statistical Methods, P.** *Statistical Uncertainties in Posterior Probabilities.* A.W. Amberg. CWI Tract, V. 93. Centrum voor Wiskunde en Informatica, 1993, 129 pp, Dfl. 40 (P). [ISBN 90-6196-422-9]

**Programming, P.** *Mastering C Pointers: Tools for Programming Power, Second Edition.* Robert J. Traister. Academic Pr, 1993, xii + 163 pp, (P), with disk. [ISBN 0-12-697409-8]

**Languages, S(17), P, L.** *The High Performance Fortran Handbook.* Charles H. Koelbel, et al. Scientific & Eng. Comput. MIT Pr, 1994, xiv + 329 pp, \$24.95 (P); \$45. [ISBN 0-262-61094-9; 0-262-11185-3] High Performance Fortran, an extension of Fortran 90, is a portable programming language that allows easy access to vector and massively parallel multiprocessors. Book presents HPF in tutorial form. SM

**Computer Systems, P.** *Learning Perl.* Randal L. Schwartz. O'Reilly & Assoc, 1993, xxv + 246 pp, \$24.95 (P). [ISBN 1-56592-042-2]

**Computer Systems, S\*\*(15), C, L.** *Solving Problems in Scientific Computing Using Maple and MATLAB.* Walter Gander, Jiří Hřebíček. Springer-Verlag, 1993, xiii + 268 pp, \$39 (P). [ISBN 0-387-57329-1] 19 nifty examples of high-level classroom applications of Maple and MATLAB: trajectories of tennis balls, orbits in the three-body problem, smoothing filters, conformal mappings, heat flow, and the compression of a metal disk. An excellent reference on undergraduate mathematical computing. MPR

**Computer Science, P.** *Statistical Analysis of Software Reliability Models.* M.C.J. van Pul. CWI Tract, V. 95. Centrum voor Wiskunde en Informatica, 1993, 186 pp, Dfl. 50 (P). [ISBN 90-6196-425-3]

**Applications (Biological Science), P.** *Moment Problems in Hilbert Space with Applications*

*to Magnetic Resonance Imaging.* M. Zwaan. CWI Tracts, V. 89. Centrum voor Wiskunde en Informatica, 1993, xv + 136 pp, Dfl. 40 (P). [ISBN 90-6196-418-0]

**Applications (Physics), T(15-16: 1, 2), S, L.** *Spacetime Without Reference Frames.* Tamás Matolcsi. Akadémiai Kiadó, 1993, 411 pp, \$50. [ISBN 963-05-6433-5] This ambitious book proceeds quickly from easy introductory generalities to sophisticated mathematical physics. Underlying mathematical concepts (tensor analysis, manifolds, and Lie groups) occupy last 100 pages. MU

**Applications (Physics), S, P.** *Quantum Inverse Scattering Method and Correlation Functions.* V.E. Korepin, N.M. Bogoliubov, A.G. Izergin. Mono. on Math. Physics. Cambridge Univ Pr, 1993, xix + 555 pp, \$100. [ISBN 0-521-37320-4] An important, carefully-crafted text, in 4 parts: examination of the Bethe ansatz and calculation of physical quantities; theory of the quantum inverse scattering; third and fourth sections apply preceding work to calculation of correlation functions. MU

**Applications (Physics), S(15-17), P, L.** *The Philosophy Behind Physics.* Thomas Brody. Eds: Luis de la Pena, Peter E. Hodgson. Springer-Verlag, 1993, xii + 355 pp, \$59. [ISBN 0-387-55914-0] This masterpiece should be much appreciated by physicists, but of less value to philosophers. Author's technical expertise is obvious throughout; thought-provoking text is virtually devoid of esoteric philosophical vocabulary, but rich in precise examples, lucid discussion, and analysis. MU

**Applications (Simulation), P.** *Algebraic Specification of Communication Protocols.* Eds: S. Mauw, G.J. Veltink. Tracts in Theoret. Comp. Sci., V. 36. Cambridge Univ Pr, 1993, xi + 197 pp, \$39.95. [ISBN 0-521-41883-6] Surveys Process Specification Formalism (PSF), a formal method for specifying and testing unambiguous mathematical models. Chapters range from tutorial on PSF through research topics. RM

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