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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:

T : Textbook	P : Professional Reading	1-4: Semester
C : Computer Software	L : Undergraduate Library	** : Special Emphasis
S : Supplementary Reading	13: Grade Level	?? : Questionable

Readers are advised that price information is subject to change. Selected books and software packages receive a second, more extensive review in the *Monthly*.

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, P, L.** *Realism and the Aim of Science.* Karl R. Popper. Routledge, 1992, xxxix + 420 pp, \$21 (P). [ISBN 0-415-08400-8] A 400-page "footnote" to Popper's *Logic of Scientific Discovery*—and this is just the first of three volumes! Surprisingly readable, even witty in parts. BC

**General, P, L.** *The Open Universe: An Argument for Indeterminism.* Karl R. Popper. Routledge, 1991, xxii + 185 pp, \$19.95 (P). [ISBN 0-415-07865-2] Part Two of a three-volume "footnote" to Popper's 1934 *Logic of Scientific Discovery*. A readable account of Popper's debunking of "scientific determinism" and his Theory of Worlds, 1, 2, and 3. BC

**General, S\*(13–14), L\*.** *The Mathematical Tool Chest.* Eds: A.W. Plank, N.H. Williams. Australian Internat Centre for Math Enrichment (U. of Canberra, POB 1, Belconnen, ACT 2616), viii + 127 pp, \$20 (P). [ISBN 0-85889-292-8] A handbook of essential knowledge for talented mathematics students covers combinatorics, number theory, algebra, inequalities, analysis, geometry. Compiled by the Australian Mathematical Olympiad Committee. A summary of definitions and results; few theorems are proved, but examples illustrate ideas. Includes reading lists for further study. LCL

**Reference, S\*\*, P, L\*\*\*.** *Index to Mathematical Problems 1980–1984.* Ed: Stanley Rabinowitz. Indexes to Math. Problems, V. 1. Math-Pro Pr (POB 713, Westford, MA 01886-0021), 1992, xii + 532 pp, \$49.95. [ISBN 0-9626401-1-5] Over 5000 problems, published 1980–

1984, from various problems columns and mathematical contests. Problems are classified and sorted by topic; references cite journal, year, page number of solution; includes many unsolved problems. Comprehensive author and title index. This is the first volume of a series planned to provide easy access to the problems literature. Easy to read two-column format; hard to put down, with challenges and information on every page. LCL

**Reference, P.** *The Whole Internet: User's Guide & Catalog.* Ed Krol. O'Reilly & Assoc, 1992, xxiv + 376 pp, \$24.95 (P). [ISBN 1-56592-025-2] What the Internet is, how it works, what activities are allowed, etc.; use of utilities such as *ftp* and *telnet*; USENET News; finding resources (e.g., on-line bibliographies) using Archie, Gopher, WAIS, and other tools; and more. A helpful reference for novices and experienced Internet users. AO

**Mathematics Appreciation, S\*(15–17), P\*\*, L\*\*.** *Discrete Thoughts: Essays on Mathematics, Science, and Philosophy.* Mark Kac, Gian-Carlo Rota, Jacob T. Schwartz. Birkhäuser, 1992, xii + 266 pp, \$29.50 (P). [ISBN 0-8176-3636-6] A collection of essays, some old, some new, by three of our most scholarly and thoughtful mathematicians. Belongs in every library. Typos that plagued *First Edition* (TR, June–July 1987) have been largely eliminated. BC

**Recreational Mathematics, L.** *Another Fine Math You've Got Me Into . . .* Ian Stewart. WH Freeman, 1992, xi + 269 pp, \$13.95 (P). [ISBN

0-7167-2341-7] A second selection (see also *Game, Set, and Math* (TR, June-July 1990)) of columns from *Pour la Science*, the French edition of *Scientific American*. DH

**Recreational Mathematics, L.** *Mathematical Circus: More Puzzles, Games, Paradoxes, and Other Mathematical Entertainments from Scientific American*. Martin Gardner. MAA, 1992, xv + 279 pp, \$17.50 (P). [ISBN 0-88385-506-2] Updated, with a new bibliography. (1979 Alfred A. Knopf edition, TR, February 1980.) DH

**Precalculus, T(13).** *College Algebra, Second Edition*. Dennis T. Christy. Wm C Brown, 1993, xvii + 478 pp, \$52.20. [ISBN 0-697-12350-2] Additions to this edition include test-point method for solving inequalities, Gauss-Jordan solution method, *ac* method for factoring trinomials. New treatments of composition of functions, factoring, graphing polynomials. New features include "Think About It" exercises, review exercises, sample chapter tests. (*First Edition*, TR, August-September 1989.) KB

**Precalculus, T(13: 1, 2).** *Precalculus, Second Edition*. Dennis T. Christy. Wm C Brown, 1993, xvii + 654 pp, \$55.10. [ISBN 0-697-12345-6] Covers standard topics; brief introductions are followed by many examples. Many routine manipulative problems; examples of calculator use throughout. DH

**Education, S, P\*\*, L.** *Geometry in the Middle Grades*. Dorothy Geddes, et al. Addenda Ser., Grades 5-8. NCTM, 1992, viii + 88 pp, \$15 (P). [ISBN 0-87353-323-2] Classroom ideas for implementing the *Curriculum and Evaluation Standards* in middle grade classrooms. Activities encouraging higher-order thinking and conjecturing deal with two- and three-dimensional geometry, relations among properties of shapes, transformation geometry, and enrichment topics. JNC

**Education, P.** *Learning to Design, Designing to Learn: Using Technology to Transform the Curriculum*. Eds: Diane P. Balestri, Stephen C. Ehrmann, David L. Ferguson. Taylor & Francis, 1992, xiv + 211 pp, \$41. [ISBN 0-8448-1706-6] Eight case studies describe roles of technology in design-based curricula in various disciplines, at school and college levels. AO

**History, L.** *Mathematics of the 19th Century: Mathematical Logic, Algebra, Number Theory, Probability Theory*. Eds: A.N. Kolmogorov, A.P. Yushkevich. Birkhäuser, 1992, xiv + 308 pp, \$149.50. [ISBN 0-8176-2552-6] Covers from early 19th century through to 1930's. Concentrates on essential concepts, methods, and algorithms. Short biographies of some mathematicians. Sequel to *History of*

*Mathematics From Antiquity to the Early Nineteenth Century*. Note price. DH

**Combinatorics, T, S, P\*, L.** *The Probabilistic Method*. Noga Alon, Joel H. Spencer, Paul Erdős. Wiley, 1992, xiii + 254 pp, \$49.95. [ISBN 0-471-53588-5] A "hands-on" introduction to an increasingly important technique in combinatorics, with many illustrative examples. The probabilistic method proves existence of certain objects or structures by showing they have a positive probability of arising "by chance." BC

**Combinatorics, P, L.** *Contemporary Design Theory: A Collection of Surveys*. Eds: Jeffrey H. Dinitz, Douglas R. Stinson. Wiley, 1992, xvi + 639 pp, \$79.95. [ISBN 0-471-53141-3] Twelve in-depth survey papers on various areas of combinatorial design theory, together with a brief introduction to the subject. AO

**Combinatorics, P.** *Combinatorics '90: Recent Trends and Applications*. A. Barlotti, et al. *Annals of Disc. Math.*, V. 52. North-Holland, 1992, ix + 566 pp, \$165.50. [ISBN 0-444-89452-7] Survey and research papers on combinatorial geometries and graphs, links with the foundations of geometry and algebra, applications. RM

**Number Theory, P.** *Diophantine Approximations and Transcendental Numbers*. Ed: Patrice Philippon. Walter de Gruyter, 1992, 307 pp, DM 278. [ISBN 3-11-013486-1] Collection of 18 articles on Diophantine geometry, transcendence on commutative algebraic groups, Drinfeld modules, zero estimates, etc. SG

**Linear Algebra, T(17: 1), S, L.** *Tensor Spaces and Exterior Algebra*. Takeo Yokonuma. Transl: Takeo Yokonuma. *Transl. of Math. Mono.*, V. 108. AMS, 1992, x + 131 pp, \$69. [ISBN 0-8218-4564-0] An elementary, straightforward introduction to tensor products, tensor algebras, and exterior algebras; requires only undergraduate linear algebra. Applications to Lie algebras. Chapter exercises, references, index. JS

**Group Theory, S(18), P.** *New Developments in Lie Theory and Their Applications*. Eds: Juan Tirao, Nolan Wallach. *Progress in Math.*, V. 105. Birkhäuser, 1992, ix + 228 pp, \$64.50. [ISBN 0-8176-3619-6] 14 lectures from the 1989 Third Workshop on Representation Theory of Lie Groups, in Córdoba, Argentina. Areas include automorphic forms, unitary duals and admissible representation of reductive groups, twistor theory, universal enveloping algebras, isospectral manifolds. JS

**Algebra, P.** *Universal Algebra and Quasigroup Theory*. Eds: A. Romanowska, J.D.H.

Smith. Res. & Expos. in Math., V. 19. Heldermann Verlag, 1992, 239 pp, DM 68 (P). [ISBN 3-88538-219-9] Ten papers from the 1989 Polish Universal Algebra Conference. Topics range from pure universal algebra to pure quasi-group theory. JS

**Algebra, P.** *Proceedings of the International Conference on Algebra, Parts 1-3.* Eds: L.A. Bokut', Yu L. Ershov, A.I. Kostrikin. AMS, 1992. Contemp. Math., V. 131. Part 1, xxvi + 712 pp, \$80 (P), [ISBN 0-8218-5136-5]; Part 2, xxvi + 704 pp, \$79 (P), [ISBN 0-8218-5137-3]; Part 3, xvi + 666 pp, \$70 (P). [ISBN 0-8218-5138-1] 154 papers from 1989 conference at Akademgorodok, Novosibirsk; in memory of A.I. Mal'cev. Topics relate to his work in groups, geometry, Lie algebras, rings, differential algebras, nonassociative rings, universal algebra, algebraic geometry, logic. DP

**Algebra, P.** *Proceedings Seminar 1986-1987: Lectures on Kac-Moody Algebras.* M.J. Bergvelt, A.P.E. ten Kroode. CWI Syllabus, V. 30. Centrum voor Wiskunde en Informatica, 1992, 97 pp, Dfl. 30 (P). [ISBN 90-6196-408-3] Lectures on structure and representations of Kac-Moody algebras (generalizations of finite-dimensional Lie algebras), including material on integral highest weight representations, basic modules, infinite-dimensional matrix algebras. RM

**Algebra, S(18), P.** *Group Representations, Volume 1.* Gregory Karpilovsky. Math. Stud., V. 175. North-Holland, 1992, \$271.50 set [ISBN 0-444-88632-X]. Part A: *Background Material*, lxii + 620 pp; Part B: *Introduction to Group Representations and Characters*, xiii + 653 pp. First of a comprehensive multi-volume project. Part B introduces group representations and character theory: Artinian rings, homological algebra, group algebras, algebras, Dedekind rings, discrete valuation rings. Bibliography, index. Note price. JS

**Algebra, T(17: 2), S, P, L.** *Algebra: An Approach via Module Theory.* William A. Adkins, Steven H. Weintraub. Grad. Texts in Math., V. 136. Springer-Verlag, 1992, x + 526 pp, \$44.50. [ISBN 0-387-97839-9] After chapters on basic group and ring theory, modules are introduced. Subsequent treatment of linear algebra, canonical forms, matrices, quadratic forms, semi-simple rings, multilinear algebra, and group representations takes module viewpoint. Exercises, index, bibliography. JS

**Calculus, S\*(13-15), L\*.** *Excursions in Calculus: An Interplay of the Continuous and the Discrete.* Robert M. Young. Dolciani Math. Expos., No. 13. MAA, 1992, xiv + 417 pp,

\$36 (P). [ISBN 0-88385-317-5] An enthusiastic, inviting exploration of diverse topics and applications in discrete and continuous mathematics and relations between them. Starts from calculus, but wanders far and wide, through number theory, probability, iteration, convergence, approximation, combinatorics, algorithms. Countless figures (many in color), tables, quotations, and historical asides. Hundreds of exercises, huge bibliography. PZ

**Real Analysis, T(18: 1), S, P, L.** *Approximation with Quasi-Splines.* G.H. Kirov. Institute of Physics Pub (1411 Walnut St., Suite 200, Philadelphia, PA 19102), 1992, vii + 251 pp, \$95. [ISBN 0-7503-0181-3] A rigorous, high-level discussion of approximative properties of quasi-splines. Treats recovery of single-variable and multi-variable functions, quadrature and cubature formulas. Translated from Bulgarian. SM

**Complex Analysis, P.** *The Madison Symposium on Complex Analysis.* Eds: Alexander Nagel, Edgar Lee Stout. Contemp. Math., V. 137. AMS, 1992, ix + 478 pp, \$49 (P). [ISBN 0-8218-5147-0] Proceedings of the June 1991 Symposium, at the University of Wisconsin, on the occasion of Walter Rudin's retirement. Forty-one papers. HD

**Complex Analysis, P.** *Multidimensional Residues and Their Applications.* A.K. Tsikh. Transl. of Math. Mono., V. 103. AMS, 1992, x + 188 pp, \$119. [ISBN 0-8218-4560-8] First half covers residues associated with mappings between Euclidean spaces. Second half presents applications to function theory, algebraic geometry, calculations of double series and integrals. Useful reference for complex analysts, theoretical physicists. HD

**Partial Differential Equations, P.** *Partial Differential Equations III.* Eds: Yu. V. Egorov, M.A. Shubin. Ency. of Math. Sci., V. 32. Springer-Verlag, 1991, 197 pp, \$59. [ISBN 0-387-52003-1] The Cauchy problem asks whether an  $n^{\text{th}}$ -order equation can be solved (locally) by prescribing values of the solution and  $(n - 1)$  derivatives along a hyper-surface. A problem is "well-posed" if it has a unique solution that depends continuously on the prescribed data, in a class of functions of prescribed smoothness. (The Cauchy-Kovalevsky theorem solves the Cauchy problem for analytic functions.) This text surveys results on the well-posedness of the Cauchy problem which apply to partial and pseudo-differential operators as generally as possible. BL

**Partial Differential Equations, T(16-17), L.** *Partial Differential Equations of Applied Math-*

*ematics, Second Edition.* Erich Zauderer. Wiley, 1989, xiii + 891 pp, \$69.95. [ISBN 0-471-61298-7] A general text on PDE's for advanced undergraduates or beginning graduates in applied mathematics, sciences, and engineering. Assumes multivariable calculus and basic ODE's, but not real analysis or measure theory. (*First Edition*, TR, February 1984.) BL

**Dynamical Systems, S, P, L.** *Introduction to Chaos and Coherence.* Jan Frøyland. Institute of Physics Pub (US Distr: Public Ledger Building, Suite 1035, Independence Square, Philadelphia, PA 19106), 1992, x + 130 pp, \$59. [ISBN 0-7503-0194-5] A slim, "elementary" introduction to theory of chaos, with a good deal of expository text. BC

**Numerical Analysis, S\*(15-16).** *Numerical Computation Using C.* Robert Glassey. Comp. Sci. & Sci. Computing. Academic Pr, 1993, vii + 283 pp, \$39.95. [ISBN 0-12-286155-8] Excellent introduction to both C and many aspects of numerical analysis. After 130+ page introduction to C, the reader is led through examples from all areas of numerical analysis: ODE's, PDE's, linear algebra, numerical integrals, etc. Computer code is available by ftp. Some exercises. MPR

**Numerical Analysis, C\*\*.** *The Student Edition of MATLAB: Student User Guide.* The Math Works. MATLAB Curr. Ser. Prentice Hall, 1992, xiv + 494 pp, (P). [ISBN 0-13-856006-4] MATLAB, a well-known and deservedly popular package for interactive numerical computation, includes facilities for two- and three-dimensional graphics, an extensive library of numerical procedures, and control flow statements for writing "programs." Text introduces *The Student Edition of MATLAB*, an affordable product for MS-DOS and Macintosh computers. Book and software can be purchased individually or together; a supplement, *Using MATLAB in the Classroom*, is free to adopters. JNC

**Numerical Analysis, P.** *Proceedings of the Fifth SIAM Conference on Parallel Processing for Scientific Computing.* Eds: Jack Dongarra, et al. SIAM, 1992, xvii + 648 pp, \$84.50 (P). [ISBN 0-89871-303-X] 94 papers from a March 1991 conference held in Houston. Papers are organized into sections on matrix computations; nonlinear equations and optimization; differential equations; applications, modeling, and simulation; performance evaluation and software tools; mathematical software. AO

**Functional Analysis, T(17-18: 1), S, P, L?** *Theory of Distributions.* M.A. Al-Gwaiz. Pure & Appl. Math., V. 159. Marcel Dekker, 1992,

ix + 257 pp, \$125. [ISBN 0-8247-8672-6] Concise introduction to theory of distributions. Brief review of topology and functional analysis, especially of locally convex spaces. Covers test functions, distributions with compact support, convolutions, Fourier transforms, tempered distributions, Sobolev spaces, applications to boundary value problems. Exercises end each chapter. Note price. HD

**Analysis, P.** *Harmonic Analysis and Discrete Potential Theory.* Ed: Massimo A. Picardello. Plenum Pr, 1992, viii + 302 pp, \$75. [ISBN 0-306-44225-6] Twenty-four lectures from Congress Proceedings from Frascati (Rome), 1991. Talks highlight links between problems in harmonic analysis on discrete groups and topics in probability theory and potential theory on their Cayley graphs. KS

**Analysis, T(17-18: 1, 2), S, P, L.** *An Introduction to Wavelets.* Charles K. Chui. Wavelet Analysis & Its Applic., V. 1. Academic Pr, 1992, x + 264 pp, \$49.95. [ISBN 0-12-174584-8] An introductory treatise on wavelets, emphasizing spline-wavelets and time-frequency analysis. Appropriate for self-study: assumes only basic real and functional analysis—covers rudiments of Fourier analysis and signal theory. With many examples, sample calculations. PZ

**Analysis, P.** *The Boundary Integral Approach to Static and Dynamic Contact Problems: Equality and Inequality Methods.* H. Antes, P.D. Panagiotopoulos. ISNM, V. 108. Birkhäuser, 1992, xv + 307 pp, \$99.50. [ISBN 0-8176-2592-5] Contact problems arise in continuum mechanics and the study of elasticity. This book formulates and discusses one approach to such problems. It is notable for its discussions of multivalued integral equations, cracks, surfaces with fractal boundaries, and a neural network approach to contact problems. JO

**Analysis, P.** *Second Siberian Winter School "Algebra and Analysis."* Eds: I.A. Aleksandrov, L.A. Bokut', Yu. G. Reshetnyak. Amer. Math. Soc. Transl. Ser. 2, V. 151. AMS, 1992, v + 145 pp, \$130. [ISBN 0-8218-3142-9] Proceedings of Second Siberian School, Tomsk State University, 1989. Eight papers on Lie algebras, geometric function theory, non-standard geometric functional analysis, three-dimensional hyperbolic manifolds,  $p$ -adic analysis, and differential equations. HD

**Algebraic Geometry, T\*(18), L.** *Algebraic Geometry: A First Course.* Joe Harris. Grad. Texts in Math., V. 133. Springer-Verlag, 1992, xix + 328 pp, \$39.95. [ISBN 0-387-97716-3] An introduction to classical, i.e., nonscheme,

algebraic geometry. The down-to-earth approach features many examples and a clear exposition of fundamental concepts. A great introduction to the subject. SG

**Algebraic Geometry, P.** *Curves, Jacobians, and Abelian Varieties*. Ed: Ron Donagi. *Contemp. Math.*, V. 136. AMS, 1992, vii + 342 pp, \$62 (P). [ISBN 0-8218-5143-8] Papers from a 1990 conference on the Schottky Problem. Authors include Accola, Donagi, Ehrenpreis, and Kempf. SG

**Algebraic Geometry, P.** *p-Adic Methods in Number Theory and Algebraic Geometry*. Eds: Alan Adolphson, Steven Sperber, Marvin Tretkoff. AMS, 1992, vii + 241 pp, \$39 (P). [ISBN 0-8218-5145-4] 17 papers from a 1989 regional AMS meeting. SG

**Geometry, S, P\*\*, L\*\*.** *Visions of Symmetry: Notebooks, Periodic Drawings, and Related Work of M.C. Escher*. Doris Schattschneider. WH Freeman, 1990, xiii + 354 pp, \$24.95 (P). [ISBN 0-7167-2126-0] The definitive work (see Extended Review, January 1992), now available in paperback. JNC

**Operations Research, P.** *Knowledge, Belief, and Strategic Interaction*. Eds: Cristina Bicchieri, Maria Luisa Dalla Chiara. *Stud. in Prob., Induct., & Dec. Theory*. Cambridge Univ Pr, 1992, xiv + 413 pp, \$64.95. [ISBN 0-521-41674-4] Interesting collection of papers from a 1989 workshop. Contributions from philosophers, logicians, and game theorists concern foundational problems related to theories of belief, rationality, formalization of knowledge, learning models, deliberation, and practical reasoning. RM

**Optimization, P.** *Optimality and Equilibria in Stochastic Games*. F. Thuijsman. *CWI Tracts*, V. 82. Centrum voor Wiskunde en Informatica, 1992, 107 pp, Dfl. 40 (P). [ISBN 90-6196-406-7] Examines limiting average equilibrium and optimal strategies for zero-sum and general-sum stochastic game models. KB

**Mathematical Modeling, P.** *Trees and Proximity Representations*. Jean-Pierre Barthélmy, Alain Guénoche. Transl: Gregor Lawden. Wiley, 1991, xvi + 238 pp, \$69.95. [ISBN 0-471-92263-3] Combinatorial analysis using  $X$ -trees (trees with some vertices labelled with elements of a set  $X$ ), and use of such models to represent "proximities." Applications to evolution, bifurcation, branching, decision theory, etc. Theoretical topics include distances, ultrametrics, topologies, combinatorial descriptions, algorithms. RM

**Mathematical Modeling, P, L.** *Lecture Notes in Control and Information Sciences-180: Sys-*

*tem Modelling and Optimization*. Ed: P. Kall. Springer-Verlag, 1992, xix + 969 pp, \$199 (P). [ISBN 0-387-55577-3] Proceedings of the Fifteenth IFIP Conference on System Modelling and Optimization, Zurich, 1992. 98 papers cover topics from optimality and duality, mathematical programming, optimal control, stochastic programming, applied modeling and optimization. Note price. SM

**Mathematical Modeling, P, L.** *Geophysical Interpretation Using Integral Equations*. L. Eskola. Chapman & Hall, 1992, xii + 191 pp, \$72.50. [ISBN 0-412-37020-4] Principles and techniques for converting boundary-value problems in geophysics to integral equation problems. Mathematical analysis not emphasized. SM

**Control Theory, P, L.** *Control and Estimation in Distributed Parameter Systems*. Ed: H.T. Banks. *Frontiers in Appl. Math.*, V. 11. SIAM, 1992, xii + 227 pp, \$56.50 (P). [ISBN 0-89871-297-1] Five expository papers. Of special interest: discussions of frequency domain techniques applied to state space or time domain problems; design of robust stabilizing finite-dimensional controllers for infinite-dimensional systems. SM

**Control Theory, P.** *Lecture Notes in Control and Information Sciences-175: Stability Analysis for Linear Repetitive Processes*. E. Rogers, D.H. Owens. Springer-Verlag, 1992, vii + 197 pp, \$46 (P). [ISBN 0-387-55264-2] Intended to present "a rigorous control theory, and associated [stability] tests, for repetitive processes with linear dynamics and a constant path length." Such processes include long-wall coal cutting and some metal rolling operations. JO

**Control Theory, P.** *Stochastic Control of Partially Observable Systems*. Alain Bensoussan. Cambridge Univ Pr, 1992, vii + 352 pp, \$74.95. [ISBN 0-521-35403-X] Studies stochastic control of systems, covering linear filtering theory and linear dynamical systems, nonlinear filtering theory and stochastic partial differential equations, the stochastic maximum principle, and stochastic control with partial information. Approach is analytical, not numerical. RM

**Probability, S(17-18), P.** *Probabilistic and Stochastic Methods in Analysis, with Applications*. Eds: J.S. Byrnes, *et al.* NATO ASI Ser. C, V. 372. Kluwer Academic, 1992, xi + 699 pp, \$234. [ISBN 0-7923-1804-8] Papers cover wavelets, frames and their applications; holography and other image processing techniques; sampling theory and methods; stochastic optimal control and filtering theory; application

of probabilistic analysis to mathematical analysis and Fourier analysis; normal numbers and dynamical systems; probability in daily lives. Note price. KB

**Stochastic Processes, T(17: 1).** *Adventures in Stochastic Processes.* Sidney Resnick. Birkhäuser, 1992, xi + 626 pp, \$64.50. [ISBN 0-8176-3591-2] Accessible to beginners, but with sections for students with strong backgrounds. Brief vignettes illustrate how theory leads to numerical calculations. Assumes no measure theory, but requires solid probability background. Develops tools of applied probability—discrete spaces, Markov chains, renewal theory, point processes, branching processes, random walks, Brownian motion. Applications include queueing, storage, risk analysis, genetics, inventory, choice, economics, sociology. With chapter exercises. KB

**Elementary Statistics, T(13: 1, 2).** *Statistics, Second Edition.* Richard C. Weimer. Wm C Brown, 1993, xx + 777 pp, \$65.25. [ISBN 0-697-12146-1] Covers standard topics. Chapters begin with interesting motivational examples. *Minitab* commands used throughout. Review exercises, computer applications, and achievement tests end each chapter. DH

**Mathematical Statistics, S(18), P.** *Topics in Nonparametric Estimation.* Ed: R.Z. Khasminskii. Adv. in Soviet Math., V. 12. AMS, 1992, x + 150 pp, \$99. [ISBN 0-8218-4111-4] Papers from Seminar on Mathematical Statistics of the Academy of Sciences of the USSR. Topics include a lower bound for risk integrals of density function estimates, estimation for nonparametric regression function, image edge nonparametric estimation, adaptive estimation, stochastic approximation, nonparametric median estimation, deviations for ergodic process empirical measures, and asymptotically optimal sequential experimental design. KB

**Mathematical Statistics, S(18).** *Information Bounds and Nonparametric Maximum Likelihood Estimation.* Piet Groeneboom, Jon A. Wellner. DMV Seminar, B. 19. Birkhäuser, 1992, viii + 126 pp, \$29.50 (P). [ISBN 0-8176-2794-4] Lecture notes from authors' course at Günzburg, Germany, in 1990. In two parts: information lower-bound theory, nonparametric maximum likelihood estimates for certain inverse problems and deconvolution problems. Well-written, concise. Varied exercises. MK

**Statistical Methods, S(17–18), P.** *Modern Sequential Analysis (SSA) in Honor of Professor Herbert Robbins.* Ed: Z. Govindarajulu. Amer. Journal of Math. & Mgmt. Sci., V. 11, Nos. 3 & 4. American Sciences Pr, 1991,

205 pp, \$98.75 (P). [ISBN 0-935950-32-X] Second volume of papers on sequential statistical analysis, from proceedings of MINICON-SSA. Sequential analysis can allow early test stopping, on both very effective and very ineffective treatments, without loss of statistical confidence. KB

**Statistical Methods, P.** *The Frontiers of Modern Statistical Inference Procedures, II.* Eds: Eve Bofinger, et al. Ser. in Math. & Mgmt. Sci., V. 28. American Sciences Pr, 1992, xii + 498 pp, \$98.75 (P). [ISBN 0-935950-30-3] The topic of the 1987 conference in Sydney was "Inference Procedures Associated with Statistical Ranking and Selection." 18 invited papers, plus responses to the talks. Nicely edited. TAV

**Statistical Methods, S(16–17).** *The Analysis of Contingency Tables, Second Edition.* B.S. Everitt. Mono. on Stat. & Appl. Prob., V. 45. Chapman & Hall, 1992, ix + 164 pp, \$39.95. [ISBN 0-412-39850-8] Methods for categorical analysis: contingency tables, log-linear models, logistic regression, ordered response variables, case-control analyses. Many examples; minimal mathematics. No exercises. (*First Edition*, TR, February 1978.) MK

**Statistics, T(15–17: 1), S, L.** *Likelihood, Expanded Edition.* A.W.F. Edwards. Johns Hopkins Univ Pr, 1992, xix + 275 pp, \$15 (P); \$40. [ISBN 0-8018-4443-6; 0-8018-4445-2] Well-written, classic text on scientific inference; treats both mathematical and philosophical foundations. Shows generality of likelihood method as a basis for statistical procedure. New edition is slightly expanded; includes five papers in appendices. (1972 Cambridge University Press edition, TR, May 1972.) KB

**Statistics, P.** *Statistics for the Twenty-First Century.* Eds: Florence Gordon, Sheldon Gordon. MAA Notes No. 26. MAA, 1992, xii + 318 pp, \$22 (P). [ISBN 0-88385-078-8] Articles address improvements in statistics education: focus; placement; curriculum changes; role of technology. With annotated bibliography on statistical education; statistical articles from newspapers and magazines; real-world datasets useful for teaching. KB

**Statistics, T(15: 1, 2), P.** *Nonparametric Statistical Inference, Third Edition, Revised and Expanded.* Jean Dickinson Gibbons, Subhabrata Chakraborti. Stat.: Textbooks & Mono., V. 131. Marcel Dekker, 1992, xix + 544 pp, \$145. [ISBN 0-8247-8661-0] Handbook of nonparametric methods; accessible to undergraduates. Updated, rewritten, and reorganized version of *Second Edition* (TR, November 1986). New features: computer applications,

emphasis on  $p$ -values, more applied numerical examples and problems, discussions of applications, more review problems, updated bibliography. Note price. KB

**Computer Literacy, P, L.** *MH & xmh: E-mail for Users and Programmers.* Jerry D. Peek. O'Reilly & Assoc, 1992, xxxiii + 685 pp, \$29.95 (P). [ISBN 0-56592-027-9] Technical and tutorial reference for the mh and xmh mail handling systems. Many well-explained examples. (*Second Edition*, TR, April 1991.) MK

**Algorithms, T(14-16: 1), L.** *Algorithms and Data Structures in Computer Engineering.* E. Stewart Lee. Jones & Bartlett, 1992, xiv + 217 pp, \$34.95. [ISBN 0-86720-219-X] Elements of data structures, and applications to compilers. Appropriate for a course that introduces all three subjects. Includes complexity, divide and conquer, binary trees, hash tables, heaps, search techniques, grammars, scanners, and parsers. RWN

**Computer Systems, P.** *Introduction to Macintosh System 7.* Marvin Bryan. Sybex, 1991, xix + 239 pp, \$19.95 (P). [ISBN 0-89588-868-8] Step-by-step guide to latest Mac operating system. BC

**Computer Systems, P, L.** *Xlib Reference Manual, Third Edition for X11, Release 4 and Release 5, Volume 2.* Ed: Adrian Nye. O'Reilly & Assoc, 1992, xvii + 1122 pp, \$34.95 (P). [ISBN 1-56592-006-6] Definitive manual for Xlib; this edition covers Release 4 and Release 5 versions of the Xlib specification. MK

**Computer Systems, S(13-14), C.** *A Guided Tour of the TI-85 Graphics Programmable Calculator with Emphasis on Calculus.* John F. Lucas, Christine A. Lucas. Ardsley House, 1992, x + 117 pp, \$18.95 (P). [ISBN 1-880157-10-1] Surveys the TI-85's graphical and numerical capabilities, touching on applications in precalculus, calculus, statistics, linear algebra, elementary differential equations, programming. A brief reference section serves as a mini-manual. Explicit mathematical viewpoint makes this a useful complement to TI's less mathematically-focused user manual. PZ

**Computer Systems, C, P.** *Algebraic Computing with REDUCE: Lecture Notes from the First Brazilian School on Computer Algebra, Volume 1.* Malcolm A.H. MacCallum, Francis J. Wright. Clarendon Pr, 1991, xx + 294 pp, \$29.95 (P); \$59.95. [ISBN 0-19-853443-4; 0-19-853444-2] One of three lecture-note volumes from the 1989 First Brazilian School on Computer Algebra. An interesting, comprehensive, self-contained, readable introduction to computer algebra in general, and to REDUCE

in particular: what it does, how it works, underlying mathematical principles, advanced topics. With numerous exercises. PZ

**Artificial Intelligence, P.** *3D Model Recognition From Stereoscopic Cues.* Eds: John E.W. Mayhew, John P. Frisby. MIT Pr, 1991, 269 pp, \$50. [ISBN 0-262-13243-5] Results of research sponsored by a 1983 grant from UK's Alvey Program in advanced information technology. Ten papers on each of three major topics: PMF Stereo Algorithm Project, 2.5D Sketch Project, 3D Model-based Vision Project. RM

**Computer Science, P.** *Action Refinements in Process Algebras.* Luca Aceto. Cambridge Univ Pr, 1992, ix + 273 pp, \$49.95. [ISBN 0-521-43111-5] Distinguished Ph.D. dissertation develops tractable notion of semantic equivalence of process algebras (prototype specification languages for concurrent, communicating systems) that do not equate parallelism with sequential nondeterminism, and that support operators for refining actions. RM

**Applications (Communication Theory), P.** *Lecture Notes in Control and Information Sciences-182: Advanced Methods for Satellite and Deep Space Communications.* Ed: J. Hagenauer. Springer-Verlag, 1992, vii + 196 pp, \$51 (P). [ISBN 0-387-55851-9] Proceedings of a 1992 seminar on theory, methods, practice, and communications spinoffs fostered by advances in deep space research. RM

**Applications (Economics), P.** *Dynamic Probabilistic Models and Social Structure: Essays on Socioeconomic Continuity.* Guillermo L. Gómez M. Theory & Dec. Lib., Ser. B, V. 19. Kluwer Academic, 1992, xiv + 448 pp, \$81. [ISBN 0-7923-1713-0] Applies stochastic analysis and control techniques to socioeconomic problems of development and growth. In three parts: traditional theories of political economy; a new approach using probabilities and variational methods; four surveys on basic machinery. DH

**Applications (Engineering), T(13-14: 2, 3), S, L.** *Engineering Mathematics: A Programmed Approach, Second Edition.* C.W. Evans. Chapman & Hall, 1992, xxii + 768 pp, \$32.50 (P). [ISBN 0-412-45640-0] Everything a beginning engineering student needs to know: precalculus, calculus, linear algebra, ordinary differential equations, difference equations, probability, statistics. Written for self-study. Chapters begin with learning objectives, end with summary. Many examples and problems, some worked out in steps, illustrate ideas. Many physical problems. HD

**Applications (Fluid Dynamics), S(17), P.**



*Modeling and Analysis of Diffusive and Advective Processes in Geosciences*. Eds: W.E. Fitzgibbon, Mary Fanett Wheeler. SIAM, 1992, 233 pp, \$44.50 (P), [ISBN 0-89871-299-8]; *Wave Propagation and Inversion*, 134 pp, \$29.50 (P), [ISBN 0-8971-300-5]; *Computational Methods in Geosciences*, 207 pp, \$44.50 (P). [ISBN 0-89871-301-3] Three volumes of papers from the September 1989 SIAM conference, held in Houston, on mathematical and computational issues in geophysical fluid and solid mechanics. SM

**Applications (Fluid Dynamics), P.** *Numerical Simulation of Unsteady Flows and Transition to Turbulence*. Eds: O. Pironneau, et al. Cambridge Univ Pr, 1992, xi + 516 pp, \$59.95. [ISBN 0-521-41618-3] Proceedings of a workshop on comparing experimental observations of turbulent fluid flow with predictions from a wide variety of numerical simulation techniques. The workshop focused on five test cases (e.g., boundary layer flow in an S-shaped duct). Each paper analyzes one test case using a particular numerical model or technique. JO

**Applications (Information Theory), P, L\*** *Information-Theoretic Incompleteness*. G.J. Chaitin. Ser. in Comp. Sci., V. 35. World Scientific, 1992, viii + 227 pp, \$48. [ISBN 981-02-1208-9] Technical survey and nontechnical discussion of author's work on information-theoretic approaches to incompleteness and randomness in mathematics, and the limitations on mathematical reasoning. Presented as a mathematical autobiography, with reprints of papers, transcripts of talks and interviews, etc. RM

**Applications (Physics), S(18), P.** *Mathematical Aspects of Classical Field Theory*. Mark J. Gotay, Jerrod E. Marsden, Vincent Moncrief. Contemp. Math., V. 132. AMS, 1992, ix + 644 pp, \$79 (P). [ISBN 0-8218-5144-6] Proceedings of the AMS-IMS-SIAM Joint Summer Research Conference held July 20–26, 1991. MU

**Applications (Physics), S(15–16), P, L\*.** *Space, Time, and Gravity: The Theory of the Big Bang and Black Holes, Second Edition*. Robert M. Wald. Univ of Chicago Pr, 1992, x + 153 pp, \$10.95 (P). [ISBN 0-226-87029-4] Revised and updated edition of the 1977 original (adding cosmic strings, inflation, the 1987 supernova, and other advances). A good piece of expository science writing. (*First Edition*, TR, February 1978.) BC

**Applications (Physics), T(16–17: 1).** *Probability and Statistics in Experimental Physics*.

Byron P. Roe. Springer-Verlag, 1992, x + 208 pp, \$39. [ISBN 0-387-97849-6] Presumes basic probability and statistical theory. Terse exposition, nonstandard notation. Contains worked and unworked problems. MK

**Applications (Physics), P, L.** *Selected Works of Yakov Borisovich Zeldovich, Volume I: Chemical Physics and Hydrodynamics*. Ed: J.P. Ostriker. Transl: A. Granik, E. Jackson. Princeton Univ Pr, 1992, ix + 479 pp, \$59.50. [ISBN 0-691-08594-3] 29 papers by Zeldovich (1914–1987) on subjects ranging from adsorption and catalysis to shock waves and flame propagation. BC

**Applications (Physics), S(18), P.** *Methods in Computational Molecular Physics*. Eds: Stephen Wilson, Geerd H.F. Diercksen. NATO ASI Ser. B, V. 293. Plenum Pr, 1992, xiv + 551 pp, \$135. [ISBN 0-306-44227-2] Lectures from a 1991 NATO Advanced Study Institute at Bad Windsheim, Germany. MU

**Applications (Physics), P, L.** *Huygens' Principle 1690–1990: Theory and Applications*. Eds: H. Blok, H.A. Ferweda, H.K. Kuiken. Stud. in Math. Physics, V. 3. North-Holland, 1992, xiii + 564 pp, \$128.50. [ISBN 0-444-89423-3] 34 papers on geometrical optics, ray and field theories, mathematical analysis, quantum electronics, nonlinear optics. Includes two nice historical background papers. BC

**Applications, P.** *Ergodic Theorems for Group Actions: Informational and Thermodynamical Aspects*. Arkady Tempelman. Math. & Its Applic., V. 78. Kluwer Academic, 1992, xviii + 399 pp, \$165. [ISBN 0-7923-1717-3] Generalizations of the classical Birkhoff and von Neumann ergodic theorems. LCL

**Applications, P, L.** *ICIAM 91: Proceedings of the Second International Conference on Industrial and Applied Mathematics*. Ed: Robert E. O'Malley, Jr. SIAM, 1992, xvii + 391 pp, \$61.50. [ISBN 0-89871-302-1] Seventeen papers based on invited presentations at ICIAM 91, ranging from wavelets to embryology. BC

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