



Telegraphic Reviews

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TELEGRAPHIC REVIEWS

Edited by **Arnold Ostebee**
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 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 receive a second, more extensive review in the *Monthly*.

Books 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.** *Calendrical Calculations.* Nachum Dershowitz, Edward M. Reingold. Cambridge Univ Pr, 1997, xxi + 307 pp, \$22.95 (P); \$64.95. [ISBN 0-521-56474-3; 0-5621-56413-1] Algorithms for calculations in 14 calendars of current and historical interest (including the Gregorian, Julian, Islamic, Hebrew, Mayan, Chinese, and Hindu calendars). Implementations of the algorithms (in Lisp) are given in an appendix. Many interesting notes and comments on history of chronology. AO

General, P. *Algebra and Operator Theory.* Eds: Yusupdjan Khakimdzhanov, Michel Goze, Shavkat A. Ayupov. Kluwer Academic 1998, viii + 250 pp, \$114. [ISBN 0-7923-5094-4] Proceedings of a 1997 French-Uzbek colloquium in Tashkent, Uzbekistan.

General, P, L. *World Directory of Mathematicians 1998, 11th Edition.* International Mathematical Union. AMS, 1998, xxii + 1093 pp, \$65 (P).

Reference, P, L. *Handbook of Mathematics and Computational Science.* John W. Harris, Horst Stocker. Springer-Verlag, 1998, xxviii + 1028 pp, \$29.95. [ISBN 0-387-94746-9] Comprehensive collection of commonly used definitions, facts, formulae, tables, techniques, etc. Includes numerical as well as analytic techniques, and a brief introduction to several computer programming languages. AO

Education, P*. *Research in Collegiate Mathematics Education, III.* Eds: Alan H. Schoenfeld, Jim Kaput, Ed Dubinsky. CBMS Issues in Math. Educ., V. 7. AMS, 1998, xii + 313 pp, \$40 (P). [ISBN 0-8218-0882-6] Papers de-

scribe methodology and research on problem solving, understanding of concepts and proofs.

History, P. *Paul Dirac: The Man and His Work.* Abraham Pais, et al. Cambridge Univ Pr, 1998, xv + 124 pp, \$19.95. [ISBN 0-521-58382-9] Lectures about Dirac's life and work by A. Pais, M. Jacob, D.I. Olive, and M.F. Atiyah as well as a memorial address given by Stephen Hawking.

Logic, P. *Advances in Modal Logic, Volume I.* Eds: Marcus Kracht, et al. CSLI Lect. Notes, No. 87. CSLI Pub (Center for Study of Language & Information, Leland Stanford Junior Univ., Stanford, CA 94305), 1998, xvi + 392 pp, \$24.95 (P). [ISBN 1-57586-102-X] Papers from a 1996 conference at the Free University of Berlin. Thematic areas: mathematics of modal logic; artificial intelligence and knowledge representation; computation; philosophy and language; proof theory.

Logic, P. *The Tbilisi Symposium on Logic, Language and Computation: Selected Papers.* Eds: Jonathan Ginzburg, et al. Stud. in Logic, Lang. & Inform. CSLI Pub (Center for Study of Language & Information, Leland Stanford Junior Univ., Stanford, CA 94305), 1998, xxxi + 376 pp, \$24.95 (P). [ISBN 1-57586-098-8] 23 papers from a 1995 conference in Gudauri (Republic of Georgia). Topics: natural language semantics; dynamic semantics and channel theory; theoretical linguistics; computational linguistics; formal logic theory; mathematical logic; theoretical computer science.

Number Theory, P. *The Theory of Partitions.* George E. Andrews. Math. Lib. Cambridge Univ Pr, 1998, xvi + 255 pp, \$29.95 (P). [ISBN

0-521-63766-X] Republication of the 1976 Addison-Wesley edition (TR, June–July 1977).

Group Theory, P. *The Atlas of Finite Groups: Ten Years On.* Eds: Robert Curtis, Robert Wilson. London Math. Soc. Lect. Note Ser., V. 249. Cambridge Univ Pr, 1998, xvii + 293 pp, \$44.95 (P). [ISBN 0-521-57587-7] 20 articles from a 1995 conference in Birmingham, England.

Group Theory, P. *Representations and Cohomology, II: Cohomology of Groups and Modules.* D.J. Benson. Stud. in Adv. Math., V. 31. Cambridge Univ Pr, 1998, xi + 279 pp, \$29.95 (P); \$69.95. [ISBN 0-521-63652-3; 0-521-36135-4] Paperback edition.

Ring Theory, P. *Representations of Affine Lie Algebras.* Vyacheslav M. Futorny. Papers in Pure & Appl. Math., V. 106. Queen's Univ, 1997, xi + 89 pp, (P). [ISBN 0-88911-756-X]

Topological Groups, P. *Positivity in Lie Theory: Open Problems.* Eds: Joachim Hilgert, et al. Expos. in Math., V. 26. Walter de Gruyter, 1998, xii + 290 pp, \$138.95. [ISBN 3-11-016112-5] 15 articles provide background and pose open problems in a variety of settings.

Algebra, P. *Mixed Motives.* Marc Levine. Math. Surv. & Mono., V. 57. AMS, 1998, x + 515 pp, \$109. [ISBN 0-8218-0785-4]

Calculus, T(15–16: 2), P. *A Course in Advanced Calculus.* Robert S. Borden. Dover, 1998, xii + 402 pp, \$12.95 (P). [ISBN 0-486-67290-5] Unabridged, slightly corrected republication of the 1983 North Holland/Elsevier Science Publishing Co. edition (TR, March 1984). Includes a new chapter on “Tips and Solutions for Selected Problems.”

Real Analysis, T(17: 4), L. *Modern Analysis.* Kenneth Kuttler. Stud. in Adv. Math. CRC Pr, 1998, 572 pp. [ISBN 0-8493-7166-X] Text for a first-year graduate course on Lebesgue integration and functional analysis. Covers standard topics (i.e., general set theory and topology, calculus in Banach spaces, Hilbert spaces, L^p spaces, representation theorems, Fourier transforms) as well as some less standard topics: probability, Bochner integral, convex functions. KS

Differential Equations, P. *Advances in Differential Equations and Mathematical Physics.* Eds: Eric Carlen, Evans M. Harrell, Michael Loss. Contemp. Math., V. 217. AMS, 1998, ix + 221 pp, \$35 (P). [ISBN 0-8218-0861-3] 14 papers from the 1997 Georgia Tech–UAB International Conference on Differential Equations and Mathematical Physics.

Differential Equations, P. *Generalized Quasilinearization for Nonlinear Problems.* V. Lakshmikantham, A.S. Vatsala. Math. & Its Applic., V. 440. Kluwer Academic, 1998, ix + 276 pp, \$140. [ISBN 0-7923-5038-3]

Partial Differential Equations, T(17–18). *Theory and Applications of Partial Differential Equations.* Piero Bassanini, Alan R. Elcrat. Math. Concepts & Methods in Sci. & Eng., V. 46. Plenum Pr, 1997, ix + 439 pp, \$115. [ISBN 0-306-45640-0]

Partial Differential Equations, T(17–18). *Partial Differential Equations and Boundary Value Problems.* Viorel Barbu. Math. & Its Applic., V. 441. Kluwer Academic, 1998, xii + 277 pp, \$129. [ISBN 0-7923-5056-1]

Numerical Analysis, S(18), P*, L*. *Computational Integration.* Arnold R. Krommer, Christoph W. Ueberhuber. SIAM, 1998, xix + 445 pp, \$64 (P). [ISBN 0-89871-374-9] Modern survey of methods and underlying mathematical principles. Gives special attention to recent developments (e.g., parallel algorithms) and to the practical application of theoretical results. Discusses both one- and multi-dimensional formulas. AO

Numerical Analysis, P. *Finite Element Analysis of Acoustic Scattering.* Frank Ihlenburg. Appl. Math. Sci., V. 132. Springer-Verlag, 1998, xiv + 224 pp, \$59.95. [ISBN 0-387-98319-8]

Numerical Analysis, P. *Combined Methods for Elliptic Equations with Singularities, Interfaces and Infinities.* Zi Cai Li. Math. & Its Applic., V. 444. Kluwer Academic, 1998, xxiv + 476 pp, \$214. [ISBN 0-7923-5084-7]

Functional Analysis, P. *Morita Equivalence and Continuous-Trace C^* -Algebras.* Iain Raeburn, Dana P. Williams. Math. Surv. & Mono., V. 60. AMS, 1998, xiv + 327 pp, \$65. [ISBN 0-8218-0860-5]

Analysis, P. *Weyl Transforms.* M.W. Wong. Universitext. Springer-Verlag, 1998, viii + 158 pp, \$44.95. [ISBN 0-387-98414-3]

Analysis, P. *Holomorphic Spaces.* Eds: Sheldon Axler, John E. McCarthy, Donald Sarason. Math. Sci. Res. Inst., V. 33. Cambridge Univ Pr, 1998, ix + 476 pp, \$54.95. [ISBN 0-521-63193-9] 16 expository papers presented in 1995 at MSRI. Topics: Bergman spaces; Hankel operators; the Dirichlet space; subnormal operators; operator models, interpolation problems, systems theory.

Analysis, P. *Boundary Value Problems for Transport Equations.* Valeri Agoshkov. Modeling & Simul. in Sci., Eng., & Tech. Birkhäuser

- Boston, 1998, xvii + 278 pp, \$69.95. [ISBN 0-8176-3986-1]
- Analysis, P.** *Stability of Functional Equations in Several Variables.* Donald H. Hyers, George Isac, Themistocles M. Rassias. Prog. in Nonlinear Diff. Equat. & Their Applic., V. 34. Birkhäuser Boston, 1998, vii + 313 pp, \$79.50. [ISBN 0-8176-4024-X]
- Algebraic Geometry, P.** *Algebraic Groups and Their Birational Invariants.* V.E. Voskresenskii. Transl. of Math. Mono., V. 179. AMS, 1998, xii + 218 pp, \$99. [ISBN 0-8218-0905-9]
- Algebraic Geometry, T(16: 2).** *Using Algebraic Geometry.* David Cox, John Little, Donald O'Shea. Grad. Texts in Math., V. 185. Springer-Verlag, 1998, xii + 499 pp, \$59.95. [ISBN 0-387-98487-9] Overview of recent developments in modern, computational algebraic geometry (using Gröbner bases, resultants, etc.). Illustrates applications in combinatorics, local rings, algebraic coding theory. RM
- Differential Geometry, T(15-17: 3), P, L.** *Modern Differential Geometry of Curves and Surfaces with Mathematica, Second Edition.* Alfred Gray. CRC Pr, 1998, xxiv + 1053 pp. [ISBN 0-8493-7164-3] New chapters on global curve theory, space curves, minimal surfaces, inversions, cyclides, the Gauss-Bonnet Theorem, and global surface theory. (First Edition, Extended Review, December 1995.)
- Differential Geometry, P.** *Compactifications of Symmetric Spaces.* Yves Guivarc'h, Lizhen Ji, J.C. Taylor. Progress in Math., V. 156. Birkhäuser Boston, 1998, xi + 284 pp, \$54.95. [ISBN 0-8176-3899-7]
- Geometry, T(13-14: 2), L.** *The Geometric Viewpoint: A Survey of Geometries.* Thomas Q. Sibley. Addison-Wesley, 1998, ix + 309 pp, [ISBN 0-201-87450-4]; *Instructor's Resource Guide: Including Solutions and Projects for the Geometer's Sketchpad to Accompany*, iii + 68 pp. [ISBN 0-201-32550-0] Readable introduction to and survey of modern geometry including transformations, symmetry, projective, finite, and non-Euclidean geometries. Examples and applications nicely motivate the development; interesting exercises. RM
- Geometry, P, L.** *Non-Euclidean Geometry, Sixth Edition.* H.S.M. Coxeter. MAA, 1998, xviii + 336 pp, \$30.95 (P). [ISBN 0-88385-522-4] This republication of a classic text includes a new section on the concept of inversive distance.
- Algebraic Topology, P.** *Homotopy Theory via Algebraic Geometry and Group Representations.* Eds: Mark Mahowald, Stewart Priddy. Contemp. Math., V. 220. AMS, 1998, xi + 379 pp, \$74 (P). [ISBN 0-8218-0805-2] Proceedings of a 1997 conference at Northwestern University.
- Optimization, P.** *Advances in Nonlinear Programming.* Ed: Ya-xiang Yuan. Appl. Optim., V. 14. Kluwer Academic, 1998, xiii + 351 pp, \$149. [ISBN 0-7923-5053-7] Proceedings of a 1996 conference in Beijing, China, honoring M.J.D. Powell's 60th birthday. Includes Powell's keynote address, 8 invited papers, and 9 contributed papers.
- Optimization, P.** *Optimisation et analyse convexe.* Jean-Baptiste Hiriart-Urruty. Presses Universitaires de France, 1998, 376 pp, 198 FF (P). [ISBN 2-13-048983-4]
- Optimization, P.** *Quasiconvex Optimization and Location Theory.* Joaquim António dos Santos Gromicho. Appl. Optim., V. 9. Kluwer Academic, 1998, xxi + 218 pp, \$109. [ISBN 0-7923-4694-7]
- Optimal Control, P.** *Lecture Notes in Control and Information Sciences-235: H_∞ Control and Its Applications.* Ben M. Chen. Springer-Verlag, 1998, xi + 351 pp, \$92 (P). [ISBN 1-85233-026-0]
- Optimal Control, P.** *Calculus of Variations and Optimal Control.* A.A. Milyutin, N.P. Osolovskii. Transl. of Math. Mono., V. 180. AMS, 1998, xii + 372 pp, \$129. [ISBN 0-8218-0753-6]
- Stochastic Processes, P.** *Random Fields and Stochastic Partial Differential Equations.* Yu. A. Rozanov. Math. & Its Applic., V. 438. Kluwer Academic, 1998, vii + 229 pp, \$105. [ISBN 0-7923-4984-9]
- Elementary Statistics, T(13: 2), C, L.** *Modern Engineering Statistics.* Lawrence L. Lapin. Duxbury Pr, 1997, xv + 583 pp, \$78.95, with disk. [ISBN 0-534-50883-9] Emphasizes applications and key statistical concepts. Favors insight over rigor; practicality over mathematical elegance; simplicity over formalism. Many engineering applications. Topics: descriptive statistics, data analysis, statistical process control, statistical models, probability, sampling distributions, statistical estimation, statistical testing, regression analysis, analysis of variance, and experimental design. Many exercises, some answers. KB
- Elementary Statistics, T(13: 2), C.** *Exploring Statistics: A Modern Introduction to Data Analysis and Inference, Second Edition.* Larry J. Kitchens. Duxbury Pr, 1998, xv + 940 pp, \$73.95, with disk. [ISBN 0-534-26346-1] Updated data sets, exercises, and examples

(over 1400 exercises and 400 data sets on disk). Emphasizes analysis and interpretation of data rather than calculations. Actively involves student in the learning process. (*First Edition*, TR, March 1988.) KB

Statistical Methods, P. *Additive and Multiplicative Semiparametric Models in Accelerated Life Testing and Survival Analysis*. V. Bagdonavičius, M. Nikulin. Papers in Pure & Appl. Math., V. 108. Queen's Univ, 1998, ii + 109 pp, (P). [ISBN 0-88911-802-7]

Statistical Methods, P. *Statistical Design and Analysis of Experiments*. Peter W.M. John. Classics in Appl. Math., V. 22. SIAM, 1998, xxiv + 356 pp, \$40 (P). [ISBN 0-89871-427-3] Unabridged republication of the 1971 Macmillan Publishing Co. edition (TR, May 1971). New Preface describes changes in the field since the book was first published.

Statistical Methods, T(13, 17: 2), P, L. *A First Course in Multivariate Statistics*. Bernard Flury. Texts in Stat. Springer-Verlag, 1997, xv + 713 pp, \$79.95. [ISBN 0-387-98206-X] Unified treatment of theoretical and practical aspects of multivariate statistics. Assumes knowledge of basic statistics and matrix algebra. Topics: multivariate normal distribution, parameter estimation, statistical inference for means, classification, multivariate analysis of variance, logistic regression, principal components, and normal mixtures. KB

Mathematical Computing, S, P, L. *The MATLAB 5 Handbook*. Darren Redfern, Colin Campbell. Springer-Verlag, 1998, xi + 488 pp, \$34.95 (P). [ISBN 0-387-94200-9] For reference rather than tutorial use. Organized by problem category (e.g., linear equations, ordinary differential equations, animation). Entries give command name, parameters, hints, and cross-references.

Mathematical Computing, S, P. *The Mathematica Primer*. Kevin R. Coombes, et al. Cambridge Univ Pr, 1998, xvii + 214 pp, \$24.95 (P); \$64.95. [ISBN 0-521-63715-5; 0-521-63130-0] A brief introduction to *Mathematica* Version 3 for novice users. AO

Applications (Economics), P, L. *Methods of Mathematical Finance*. Ioannis Karatzas, Steven E. Shreve. *Appl. of Math.*, V. 39. Springer-Verlag, 1998, xv + 407 pp, \$69.95. [ISBN 0-387-94839-2] Sets up Brownian model for financial markets; treats pricing and hedging contingent claims; addresses problems faced by agents (one or several) for optimal consumption and investment decisions. Reader must be familiar with probability and stochastic processes. KS

Applications (Fluid Mechanics), P. *Weakly Nonlocal Solitary Waves and Beyond-All-Orders Asymptotics: Generalized Solitons and Hyperasymptotic Perturbation Theory*. John P. Boyd. *Math. & Its Applic.*, V. 442. Kluwer Academic, 1998, xix + 590 pp, \$198. [ISBN 0-7923-5072-3]

Applications (Mechanics), P. *Computational Inelasticity*. J.C. Simo, T.J.R. Hughes. *Interdisc. Appl. Math.*, V. 7. Springer-Verlag, 1998, xiv + 392 pp, \$59.95. [ISBN 0-387-97520-9]

Applications (Mechanics), P. *Generalized Analytic Functions: Theory and Applications to Mechanics*. Eds: Helmut Florian, et al. Intern. Soc. for Analysis, Applic. & Comput., V. 1. Kluwer Academic, 1998, xxvi + 311 pp, \$140. [ISBN 0-7923-5043-X] Proceedings of a 1997 conference at the Technical University of Graz. First part treats generalized analytic functions in the complex plane and in higher dimensions. Second part focuses on applications to mechanics.

Applications (Physics), T(17: 1). *The Geometry of Physics: An Introduction*. Theodore Frankel. Cambridge Univ Pr, 1997, xxii + 654 pp, \$95. [ISBN 0-521-38334-X] Introduction to differential geometry and topology, Lie groups, bundles and forms, etc., for modern and classical physics. Good, intuitive development of the fundamental concepts by discussion of surfaces in space. RM

Applications (Systems Theory), P. *Lecture Notes in Control and Information Sciences—234: Neural Networks in Multidimensional Domains: Fundamentals and New Trends in Modelling and Control*. Paolo Arena, et al. Springer-Verlag, 1998, xv + 165 pp, \$59 (P). [ISBN 1-85233-006-6]

Applications (Systems Theory), P. *Lecture Notes in Control and Information Sciences—232: Experimental Robotics V*. Eds: Alicia Casals, Anibal T. de Almeida. Springer-Verlag, 1998, xix + 700 pp, \$129 (P). [ISBN 3-540-76218-3] Proceedings of a 1997 conference in Barcelona, Spain.

Applications, P. *Optical Pattern Recognition*. Eds: Francis T.S. Yu, Suganda Jutamulia. Cambridge Univ Pr, 1998, xv + 440 pp, \$105. [ISBN 0-521-46517-6] 15 chapters, each written by a specialist, provide an overview of theoretical and practical aspects of the subject.

Reviewers

KB: Karla Ballman, Macalester; RM: Richard Molnar, Macalester; AO: Arnold Ostebee, St. Olaf; KS: Karen Saxe, Macalester.