The author points out useful relationships between various algorithms. Data structures needed to implement each algorithm are briefly discussed. For the most part, the book avoids worst-case complexity issues, opting instead for brief discussions of the empirical performance of the algorithms. The book is appropriate for an introductory graduate-level course. It contains a good collection of exercises. It is more or less self-contained; however, some knowledge in linear programming would be useful.

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29[68–00, 68Q40].—MARTHA L. ABELL & JAMES P. BRASELTON, *The Mathematica Handbook*, Academic Press, Boston, 1992, xvi+789 pp., $23\frac{1}{2}$ cm. Price: Softcover $32.50.

Intended as a supplement to the manual for the Macintosh version of the computer system "Mathematica" distributed by Wolfram Research Inc., this handbook is organized alphabetically rather than by topic. Its primary strength is that it provides many simple examples covering some 1500 commands. Virtually every page has one or more Macintosh computer bit-map displays.

Unfortunately, the book is typographically cluttered, the bit-map displays detract from the readability, it has not been carefully proofread, and it does not explain any of the numerous topics that are likely to remain unclear from the manual. I noted particularly inadequate coverage of such confusing subjects as Block, Module, Context, If, Function, and Patterns.

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30[68Q40].—MALCOLM A. H. MACCALLUM & FRANCIS J. WRIGHT, *Algebraic Computing with REDUCE*, Lecture Notes from the First Brazilian School on Computer Algebra, Vol. 1, Clarendon Press, Oxford, 1991, xx+294 pp., $23\frac{1}{2}$ cm. Price $59.95 hardcover, $29.95 paperback.

The REDUCE Computer Algebra system has a long history of wide distribution on a variety of computers. Its international community continues to use and improve the program, under the coordination of its original author, A. C. Hearn at the RAND Corp.

This text, which is based on a series of lectures on REDUCE delivered in 1989, targets an audience of persons who need more information than is readily available from the REDUCE manual and the source code for the system.

The authors provide authoritative and substantial additional background, commentary, and examples of usage and programming using REDUCE data types and commands. The authors' concerns range from the mundane (e.g., the differences between the ATARI ST version and other systems) to deep mathematical issues (at least briefly, the algorithms for polynomial factoring and indefinite integration are discussed).

Strengths of the book include the demystification of some components of REDUCE as well as its implementation in LISP, and pointers to research papers and books with further details.

This text is recommended for serious REDUCE users as well as for the casual REDUCE user interested in learning more about the system.

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31[65–06, 68–06].—ROBERT E. O'MALLEY, JR. (Editor), *ICIAM* 91: *Proceedings of the Second International Conference on Industrial and Applied Mathematics*, SIAM, Philadelphia, PA, 1992, xviii+391 pp., 26 cm. Price $61.50.

The conference in the title, sponsored internationally by 12 societies of Applied, Industrial and Computational Mathematics, was held July 8–12, 1991, in Washington, D.C. Part I of the proceedings contains the text of 17 invited presentations, Part II an account of over 160 minisymposia organized in 29 chapters according to subject areas.

The authors and titles of the invited papers in Part I are: J. M. Ball, Dynamic energy minimization and phase transformations in solids; G. I. Barenblatt, Intermediate asymptotics in micromechanics; M. Brady, Computer vision: mathematics and computing; R. Coifman, Y. Meyer & V. Wickerhauser, Adapted wave form analysis, wavelet-packets and applications; A. R. Conn, N. Gould & Ph. L. Toint, Large-scale nonlinear constrained optimization; C. N. Dawson & M. F. Wheeler, Time-splitting methods for advection-diffusion-reaction equations arising in contaminant transport; W. Eckhaus, On modulation equations of the Ginzburg-Landau type; A Fasano, Modelling the solidification of polymers: an example of an ECMI cooperation; M. Grötschel, Discrete mathematics in manufacturing; F. L. Chalot & T. J. R. Hughes, Analysis of hypersonic flows in thermochemical equilibrium by application of the Galerkin/least-squares formulation; N. Karmarkar, Interior-point methods in optimization; P. L. Lions, Viscosity solutions and optimal control; M. Mimura, Dynamics of patterns, waves, and interfaces from the reaction-diffusion aspect; J. D. Murray, Complex pattern formation in embryology: models, mathematics, and biological implications; G. Ruget, Trends in radar architectures; D. J. Wallace, Massively parallel computing: status and prospects; H. Yserentant, Hierarchical bases.

A useful feature in Part II is a list of suggested reading appended to each chapter.

The volume, which is attractively sprinkled with photographs of speakers and participants, ends with an author index and a list of attendees.

W. G.

32[65C10, 68Q15, 94A60].—NOAM NISAN, *Using Hard Problems to Create Pseudorandom Generators*, An ACM Distinguished Dissertation 1990, The MIT Press, Cambridge, MA, 1992, x+43 pp., $23\frac{1}{2}$ cm. Price $20.00.

This book is a slightly revised version of the author's doctoral dissertation written under the supervision of R. Karp at Berkeley. It deals with pseudoran-