

REVIEWS AND DESCRIPTIONS OF TABLES AND BOOKS

The numbers in brackets are assigned according to the American Mathematical Society classification scheme. The 2000 Mathematics Subject Classification can be found in print starting with the 1999 annual index of *Mathematical Reviews*. The classifications are also accessible from www.ams.org/msc/.

1[35F10, 35K15, 65M06, 65M12]—*Time-dependent partial differential equations and their numerical solution*, by Heinz-Otto Kreiss and Hedwig Ulmer Busenhardt, Birkhäuser, Basel, Boston, Berlin, 2001, vi+82 pp., 24 cm, \$24.95

This book contains short lecture notes summarizing the main results from the following two books: *Initial-boundary value problems and the Navier-Stokes equations* by H.-O. Kreiss and J. Lorenz, Academic Press, 1989, and *Time dependent problems and difference methods*, John Wiley & Sons, 1995. Simple examples are given to illustrate the main results. The main results are presented and some proofs demonstrating important approaches are also given. Explicit references to the relevant chapters in the two books mentioned above are given at the end of each chapter. There are four chapters in this short book: on Cauchy problems, half plane problems, difference methods, and nonlinear problems, respectively. This is a very good book for lecture notes of a condensed course on the topics of time-dependent partial differential equations and difference methods at the beginning graduate level; for example, for a summer course. It is also a good book for anyone who is interested in getting a quick start on learning these topics.

CHI-WANG SHU

2[65-02]—*Foundations of computational mathematics*, Ronald A. Devore, Arieh Iserles, and Endre Süli (Editors), Cambridge University Press, New York, NY, 2001, viii+400 pp., 23 cm, softcover \$49.95

This volume contains thirteen papers presented by plenary speakers at the 1999 conference in Oxford devoted to Foundations of Computational Mathematics. The contents are as follows.

Singularities and computation of minimizers for variational problems, J. M. Ball; *Adaptive finite element methods for flow problems*, R. Becker, M. Braack and R. Rannacher; *Newton's method and some complexity aspects of the zero-finding problem*, J.-P. Dedieu; *Kronecker's smart, little black boxes*, M. Giusti and J. Heintz; *Numerical analysis in Lie groups*, A. Iserles; *Feasibility control in nonlinear optimization*, M. Marazzi and J. Nocedal; *Six lectures on the geometric integration of ODEs*, R. I. McLachlan and G. R. Quispel; *When are integration and discrepancy tractable?* E. Novak and H. Woźniakowski; *Moving frames—in geometry, algebra, computer vision, and numerical analysis*, P. J. Olver; *Harmonic map flows and image processing*, G. Sapiro; *Statistics from computations*, H. Sigurgeirsson and A. M. Stuart; *Simulation of stochastic processes and applications*, D. Talay; *Real-time*