

These are the proceedings of a NATO Advanced Study Institute on Approximation Theory and Spline Functions held at Memorial University of Newfoundland August 22–September 2, 1983. The 38 papers included cover a wide range of approximation theory and are devoted about equally to univariate and multivariate theory. There are six papers dealing specifically with spline functions and their applications.

W. G.

**12[65–06].**—DAVID F. GRIFFITHS (Editor), *Numerical Analysis*, Lecture Notes in Math., vol. 1066, Springer-Verlag, Berlin, 1984, ix + 275 pp., 24 cm. Price \$14.00.

This volume contains the texts of 15 invited talks given at the Tenth Dundee Biennial Conference on Numerical Analysis, held June 28–July 1, 1983, at the University of Dundee, Scotland. Topics covered include high-accuracy floating-point algorithms for algebraic processes, spline approximation, numerical methods for optimization problems, bifurcation phenomena, stiff ordinary differential equations, partial differential equations and weakly singular integral equations.

W. G.

**13[68–06, 68Q40].**—JOHN FITCH (Editor), *EUROSAM 84*, Lecture Notes in Comput. Sci., vol. 174, Springer-Verlag, Berlin, 1984, xi + 396 pp., 24 cm. Price \$18.00.

These are the proceedings of an International Symposium on Symbolic and Algebraic Computation, held in Cambridge, England, July 9–11, 1984. The 37 papers are grouped by topic under the headings: Differential Equations, Applications, Simplification and Algorithm Implementation, Algebraic Number Computation, Languages for Symbolic Computing, Groebner Basis Algorithms, Computational Group Theory, Factorization and GCD Computations, Number Theory Algorithms, Integration, Solution of Equations. The large number of categories attests to the great diversity of current potential, and actual, uses of symbolic computation. Specific applications discussed concern nonlinear control theory, quartic equations and Riemann tensor classification, the Dirichlet problem for Laplace's equation, code generation for finite element analysis, Padé approximation, and automatic control of error accumulation.

W. G.

**14[65–06, 65F10, 65F50, 65N30, 65N35, 65N50, 68N99].**—GARRETT BIRKHOFF & ARTHUR SCHOENSTADT (Editors), *Elliptic Problem Solvers II*, Academic Press, Orlando, Fla., 1984, xiii + 573 pp., 23½ cm. Price \$39.00.

These are the proceedings of the Elliptic Problem Solvers Conference held at the Naval Postgraduate School in Monterey, California, January 10–12, 1983. The 38 papers are grouped here, as they were at the conference, roughly by topic under the headings: I. Software Packages, II. Vector and Parallel Processing, III. Iterative Equation Solving, IV. Finite Element and Multigrid Methods, V. Advances in

Modeling and Physical Applications. Especially timely are the discussion of currently available software packages, such as ELLPACK, ITPACK, MODULEF, and the Yale Sparse Matrix Package; the possibilities offered by vector and parallel computers; and the numerical modeling of semiconductors.

W. G.

**15[41–06, 30E10, 33A65, 41A05, 41A20, 41A21].**—P. R. GRAVES-MORRIS, E. B. SAFF & R. S. VARGA (Editors), *Rational Approximation and Interpolation*, Lecture Notes in Math., vol. 1105, Springer-Verlag, Berlin, 1984, xii + 528 pp., 24 cm. Price \$25.50.

This volume contains the proceedings of the Conference on Rational Approximation and Interpolation, held at the University of South Florida, Tampa, Florida, December 12–16, 1983. It opens with four survey papers: “The Faber Operator” by J. Milne Anderson, “Survey on Recent Advances in Inverse Problems of Padé Approximation Theory” by G. López Lagomasino & V. V. Vavilov, “Some Properties and Applications of Chebyshev Polynomial and Rational Approximation” by J. C. Mason, “Polynomial, Sinc and Rational Function Methods for Approximating Analytic Functions” by F. Stenger, and is followed by 39 research articles on such topics as approximation and interpolation theory, block structures of Padé and other tables, circuit theory, convergence theory, critical phenomena, location of zeros and poles, and numerical methods. The vitality of the field, and the excitement generated by some of the recent advances, can be felt even upon a cursory reading of these proceedings.

W. G.

**16[78–06, 78A45].**—WOLFGANG-M. BOERNER et al. (Editors), *Inverse Methods in Electromagnetic Imaging*, Parts 1 and 2, Reidel, Dordrecht, Holland, 1985, xxxii + 1347 pp., 24½ cm. Price \$145.00.

The proceedings of the NATO Advanced Research Workshop on Inverse Methods in Electromagnetic Imaging, held at Bad Windsheim, Germany, September 18–24, 1983, these volumes comprise 70 papers, organized into five topics: Mathematical inverse methods and transient techniques, numerical inversion methods, polarization utilization in the electromagnetic vector inverse problem, image quality and image resolution in remote sensing and surveillance, holographic and tomographic imaging and related phase problems. Dealing with notoriously ill-posed problems, the papers on numerical methods should be of particular interest to readers of this journal.

W. G.

**17[58Fxx, 70Kxx].**—P. FISCHER & WILLIAM R. SMITH (Editors), *Chaos, Fractals, and Dynamics*, Lecture Notes in Pure and Appl. Math., vol. 98, Marcel Dekker, New York and Basel, 1985, viii + 261 pp., 25 cm. Price \$59.75 (U. S. and Canada), \$71.50 (all other countries).