

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).

Irregular ("chaotic") behavior of nonlinear dynamical systems and related irregular shapes and patterns are currently the subject of renewed interest, owing in part to the feasibility of extensive computer simulation work. The volume under review collects 18 papers on this topic, presented at or resulting directly from two conferences held at the University of Guelph in March of 1981 and 1983.

W. G.

**18[65-06, 41A65, 65D15, 65N30].**—P. R. TURNER (Editor), *Numerical Analysis Lancaster 1984*, Lecture Notes in Math., vol. 1129, Springer-Verlag, Berlin, 1985, xiv + 179 pp., 24 cm. Price \$12.00.

The second Summer School in Lancaster, England, sponsored by the Science and Engineering Research Council, took place July 15–August 3, 1984 and was devoted to an in-depth study of special topics in numerical analysis, specifically constructive approximation theory, optimal recovery, and variational methods in elliptic boundary value problems. The volume under review contains the lecture notes of four main courses given on that occasion; two ten-lecture courses, "Optimal Methods in Approximation Theory" (73 pages) by C. A. Micchelli & T. J. Rivlin, and "Variational Theory and Approximation of Boundary Value Problems" (40 pages) by R. E. Showalter; and two five-lecture courses, "Algorithmic Aspects of Approximation Theory" (20 pages) by E. W. Cheney, and "An Introduction to the Analysis of the Error in the Finite Element Method for Second-Order Elliptic Boundary Value Problems" (46 pages) by A. H. Schatz. Two other main courses on multigrid methods by A. Brandt and W. Hackbusch were based on material now available in the Lecture Notes, vol. 960, and are therefore not included here, except for tables of contents.

W. G.