

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.

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**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.

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