

and with the nice selection of problems included, the book can serve as a text for a very interesting secondary excursion into the realm of matrix theory.

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15[3, 3.25].—I. S. DUFF & G. W. STEWART (Editors), *Sparse Matrix Proceedings*, SIAM, Philadelphia, Pa., 1978, xvi + 334 pp., 24 cm. Price \$21.50.

The papers in this book were presented at the Symposium on Sparse Matrix Computations held in Knoxville, Tennessee on November 2–3, 1978. Fourteen papers were presented on applications, software, and algorithms. The programming committee has tried to present an up-to-date account of developments in the area of sparse matrix computations.

J. H. B.

16[13.05].—CLAUDE JABLON & JEAN CLAUDE SIMON, *Applications des Modèles Numérique en Physique*, Interdisciplinary System Research 53, Birkhäuser Verlag, Basel, Stuttgart, 1978, 283 pp., 23 cm. Price Fr. 48.—.

This volume is written, in particular with physicists in mind, to explain the rules and help avoid pitfalls in numerical computation. The introduction is unusual in that it includes a discussion of the representation of mathematical models by computer programs from the aspects of linguistics and the theory of computation. The book then explains the basic concepts of numerical computation and goes on to treat numerical methods for a nonlinear equation, interpolation and approximation, and differential equations. The depth of treatment varies considerably and, as is reasonable in a book aimed at physicists, parabolic and elliptic partial differential equations are given relatively much space. The final chapter contains a useful discussion of the role of numerical models in physics and gives some hints on how to structure and document a Fortran program.

This book does not attempt to give a complete coverage of numerical methods, but even so the topics could have been better chosen. The most striking omission is that there is no systematic treatment of numerical methods of linear algebra. For example, eigenvalue problems, which certainly arise very frequently in physical applications, are not at all treated here. I also think that some space should have been devoted to methods for solving minimization problems and systems of nonlinear equations. The hope, expressed by the authors on page 13, that ideas in the (very short) section on solving a single nonlinear equation should enable a reader to tackle systems of nonlinear equations, seems to me to be very optimistic. I would have much preferred a modern treatment on spline approximation to the long section devoted to approximation by sums of translated functions. In the last chapter I missed a comment on the importance of portability.

The fact that descriptions in this book are very much from a user physicist's point of view might attract readers. I liked the introduction and the final chapter best.