in the study of probability and statistics, he provides a stimulus for proficient programming. The book, as it stands, would be a valuable addition to any technical library. Clearly written, as well as entertaining, it could be used for self study. However, the book would be most effective when used as a supplementary text and workbook in an introductory course in probability and statistics.

Reprinted from *Computer*, September 1979.

Transform Methods with Applications to Engineering and Operations Research—Eginhard J. Muth (Englewood Cliffs, NJ: Prentice-Hall, 1977, 372 pp.). *Reviewed by Lokenath Debnath, Mathematics and Physics Departments, East Carolina University, Greenville, NC 27834.*

Integral transform methods are simple, effective mathematical methods widely used for finding solutions of problems in applied mathematics, physics, engineering, operations research, and other related areas. With reader background in calculus and ordinary differential equations, this book is a brief introduction to the Laplace transforms and Z-transforms and their applications to simple engineering problems involved with ordinary differential and difference equations. It gives an easy manipulative treatment of the Laplace and Z-transforms rather than a rigorous and systematic theory.

It has seven chapters, a short bibliography, and four appendices containing tables of the Laplace transforms and Z-transforms. Chapter 1 deals with an introduction to algebra of complex numbers and the concept of analytic functions.

In Chapters 2 and 3, the author considers the elementary properties of the Laplace transforms and the inverse Laplace transforms. The methods of partial-fraction decomposition are used to obtain the inverse Laplace transforms by the complex integral formula and its evaluation by the method of residues.

Chapter 4 is devoted to simple applications of the Laplace transform to certain classical problems in electrical circuits, mechanical systems, deflection of beams, and moment generating functions in statistics and operations research. Most of these problems are governed by ordinary linear differential equations.

In Chapters 5 and 6, the properties of the Z-transforms and the inverse Z-transforms are systematically discussed with examples.

The final chapter deals with applications of the Z-transforms to numerous problems governed by linear difference equations. It includes problems in simple and compound interest, inventory control model, electrical ladder network, time-series analysis, data smoothing, digital filtering, Poisson's process, and discrete probability distributions and moment generating functions.

All chapters are provided with numerous problems for solution. The book is well written and does not contain any incorrect information or serious errors. In the opinion of the reviewer, the book seems to be helpful for ill-prepared students, but may not be useful and stimulating for well-prepared students of engineering.

The following comments are in order. First, the Laplace transforms which are still prediminantly used in solving partial differential equations are completely excluded from this book. Second, the treatment of the inverse Laplace transforms without the residue theory of analytic functions is also uninspired. This book would have been more useful and stimulating for engineering students if some interesting recent applications of the transforms were included. In the opinion of the reviewer, this book is not really the top of its kind. It seems to be moderately successful as a text at an engineering undergraduate level.

Reprinted from *IEEE Transactions on Systems, Man, and Cybernetics*, August 1979.

Topics in Applied Physics—Volume 30: Excimer Lasers—Charles K. Rhodes, Ed. (Berlin: Springer, 1978, 194 pp., $36.30). *Reviewed by Robert T. Brown, United Technologies Research Center, East Hartford, CT 06108.*

It is difficult to think of an active research area which is more diverse or which is developing more rapidly than that of excimer lasers. In a field occasionally dubbed the "laser-of-the-month club," the task of presenting a current and complete treatment of this subject is an ambitious one, indeed. Upon careful reading of this book, with its 59 figures, 29 tables, and 194 pages, one finds that the authors have succeeded admirably in their endeavor. As implied by the title, the book deals with bound-free excimer systems, and specifically excludes technologically similar bound-bound systems, such as the metal halides. Written in a readable style, and with over 500 listed references, this work will serve both as a useful handbook for active researchers as well as an introductory source for newcomers to this exciting field.

Following the introduction in Chapter 1, Chapter 2, by M. Krauss and F. H. Mies, discusses the electronic structure and radiative transitions of excimer systems. This chapter provides a theoretical description of valence, ion-pair, and Rydberg systems as well as an analysis of emission processes and calculations of the optical cross section.

Chapter 3, by M. McCusker, deals with the rare gas excimers and gives both theoretical and experimental results for the pure rare gases, the rare gas-oxides, and the homonuclear hologens. The author provides a good discussion of the energy flow pathways in high pressure gases, starting from the initial pump energy (e.g., from a high-energy electron beam), and following through various collisional quenching and photon absorption processes.

Chapter 4, by C. A. Brau, discusses the rare gas halogen excimers. As with other portions of the book, this chapter does an excellent job of combining experimental results with a theoretical discussion of microscopic kinetic processes. Brau's extensive tables of reaction processes give a valuable compendium of rate data, in addition to providing a detailed picture of the kinetics of rare gas halogen plasmas. The discussion of photoabsorption processes is a bit dated in its failure to mention recent improvements in XeF and XeCl laser performance, obtained by elimination of argon dimer absorbers. The chapter concludes with a systems-oriented discussion of various excitation techniques along with some potential applications for rare gas halogen lasers.

Chapter 5, by A. Gallagher, covers metal vapor excimers. A brief theoretical discussion of optical properties is followed by a discussion of the specific properties of various metal-metal and metal-rare gas excimers. Excitation methods and efficiency are also discussed.

The final chapter, by C. K. Rhodes and P. W. Hoff, presents a number of interesting and potentially significant applications of excimer lasers. These include photolytic excitation of laser media, short wavelength generation, studies of high-lying electronic states and isotope separation.

In all, the book is a valuable contribution to the literature of this new and rapidly developing technology.

Reprinted from *IEEE Journal of Quantum Electronics*, vol. QE-15, no. 9, September 1979.

Reading Technical Books—Anne Eisenberg (Englewood Cliffs, NJ: Prentice-Hall, 1979, 241 pp., $7.95). *Reviewed by Della A. Whittaker, U.S. Army Harry Diamond Laboratories, Aldelphi, MD 20783.*

When an engineer wants to read about a technical subject not in his field, he becomes a student in the new field. He has to define new terms, look for main topics, classify information, and relate examples to the main topics. He has to match drawings, graphs, tables, and photographs to the text. In effect, he has to dust off old study skills to learn the new subject.

Anne Eisenberg can help a student in the physical sciences update his study skills and learn new ones. In *Reading Technical Books*, the methods that she teaches are standard for students of any subject, but her examples are from textbooks on electronics, physics, chemistry, metallurgy, automotive technology, geology, civil engineering, and other technologies. An assistant professor of developmental reading at New York City Community College, Eisenberg tested the book in classes in those technologies there and at the City University of New York. She got Gary Benenson, physicist and electrical engineer, to check the science content.

Part I describes how to think and learn about science terms, how to separate ideas from examples of them, and how to distinguish contrasts from cause-effect conditions. Part II gives standard steps for studying a textbook chapter: (1) As an overview, read the chapter headings, figures, tables, introduction, summary, and study questions. (2) Read the text and underline key terms, number the subtopics, and summarize them in the margin. (3) For later recall, outline while reading. Part III lists Greek and Latin roots of scientific words, tells what to take notes on while listening to a technical lecture, and explains how to take tests efficiently.

These methods appear in all books that teach good study skills. This book, especially, should appeal to engineers because the examples come