with bursts at longer wavelengths. The author discusses several interpretations of the mechanisms related to these radio bursts. In chapter 8 Kundu discusses radio emissions in the frequency range between meter and centimeter wavelengths which show some similarities with the adjacent regions, but which on the other hand have properties characteristic for this decimeter wavelength region only. In chapter 9 there follows a description and interpretation of meter-wavelength radio emission of sporadic nature. This radiation is a powerful means for studying plasma and solar physics.

Chapter 10 is entirely devoted to intense and sudden meter-wavelength radiation that shows a slow drift in frequency. Chapter 11 then discusses the period of enhanced radiation following great outbursts of solar radio emission and chapter 12 deals with noise-storm radiation at meter wavelengths. In chapter 13 the author investigates the correlation between centimeter-wavelength emission and x-ray radiation. In the next chapter the relationship between solar radio bursts, geomagnetic storms and solar cosmic rays is dealt with. In chapter 15 Kundu discusses the dependence of solar emission from active solar regions and deals with an explanation of the production of different radiation types on the basis of the behavior of an active region relative to time. In chapter 16 the author investigates and interprets the observed increase of angular size and decrease of intensity of a radio source as its radiation passes through the outer corona. In the next chapter radar observations are described and in the last section Kundu investigates briefly the role of a satellite in observation of solar bursts. About 400 references help the reader through the literature.

Kundu's book is a comprehensive and excellent work on solar radio astronomy. He not only succeeded in summarizing the different observations on the subject, but also discusses the results, tries to explain the mechanisms involved and makes conclusions from the data published.

The book will be of high value to any radio astronomer and particularly to a solar investigator both from the astronomical and radio-technical field.

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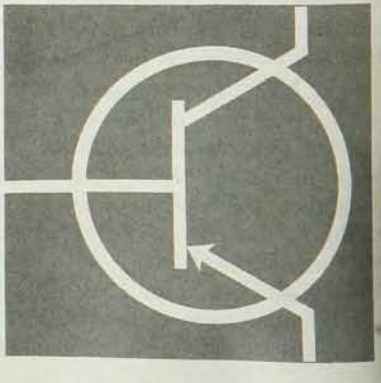
A specialist in electronics, H. J. Hagger is associated with Albiswerk/Zürich in Switzerland.

For better understanding

TRANSISTORS: PRINCIPLES AND APPLICATIONS. By R. G. Hibberd. 304 pp. Hart, New York, 1965. $5.95

by H. J. Hagger

"Intended mainly for students and technicians," as the author states in the preface to this book, the subject is explained in words, detailed descriptions and drawings. The author starts with a historical introduction and with simple basic principles of solid-state physics, discussing junction and recombination phenomena by very simple and well composed model pictures. The reader is then gradually guided through basic circuits and fundamental equations. In chapter 3 transistor characteristics of input and output variables are discussed. The effects of temperature on leakage current are briefly considered stating rule of thumb for its increase. Voltage and current limitations, junction temperature and power dissipation as well as frequency and noise characteristics are treated briefly and generally. In a very good 4th chapter on transistor technology, standards and even more recently introduced manufacturing methods are explained. In chapter 5 the author switches to associated semiconductor devices, such as point-contact, gold-bonded and junction diodes, as well as tunnel and backward diodes. Rectifi-



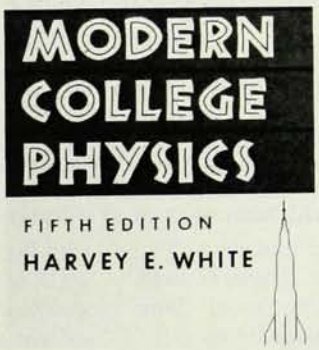
physics texts for college students

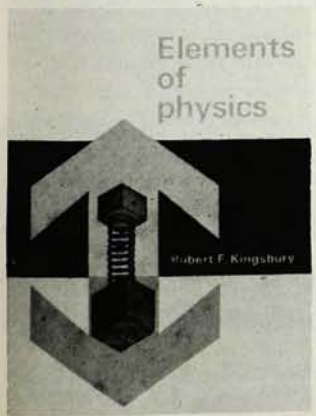
Descriptive College Physics, Second Edition

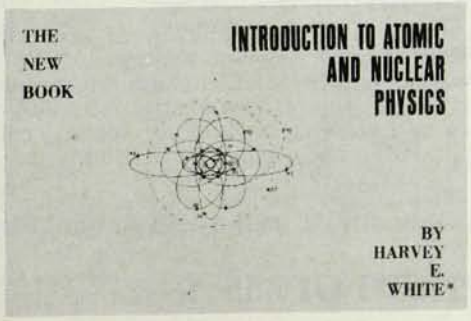
By Harvey E. White. 1963; 397 pages; $8.00.

"The format and level of this text seem ideally suited for the nonscience major. The presentation is well designed to create the interest necessary for learning to take place." — B. S. Strope, College of Idaho.

The Second Edition of this well established one-semester textbook has several major improvements. Of the forty chapters in the first edition, three have been replaced by new chapters: Planetary Motion and Satellites; Diffraction, Interference and Polarization; and Relativity. All new problems appear at chapter ends; color is used in many figures, and a two-column format has been adopted. Throughout, the book reflects current research achievements. A workbook with answers to even-numbered problems is available.







Introduction To Atomic And Nuclear Physics

By Harvey E. White, University of California, Berkeley, 1964; 560 pages; $9.75.

Professor White's intermediate text puts the most active and current fields of physics within reach of the student who has had only one previous course. After a quick review of fundamental measurement, the author clearly develops the key topics of modern physics — electric and magnetic fields, light, spectrum analysis, atomic structure, waves, vacuum tubes, semiconductors, lasers, electron optics, radio, radar, and television. Relativity studies introduce work on disintegration and transmutation of elements, fission, fusion, and elementary particles. **The text employs no mathematics beyond algebra and trigonometry.** There are numerous illustrations and problems plus footnote histories of great men of science and ten appendices. The line diagrams utilize a second color for clarity.

Modern College Physics, Fifth Edition

By Harvey E. White. 1966; 784 pages; $10.75.

"Very impressive with its fluid style and imaginative, clear illustrations. The material has been skillfully selected. This allowed the inclusion of substantial parts of modern physics even while no important area of classical physics has been neglected. In fact, many interesting applications of physics in everyday life have been given that are rarely found in comparable textbooks. The mathematical treatment is on a level to make the book easily understandable to anyone with even the most elementary mathematical knowledge. This is, of course, in conformity with the intention of the author to write a book for one-year college general physics courses." — Doris Wilsdorf, University of Virginia.

Elements of Physics

By Robert F. Kingsbury, Bates College. 1965; 640 pages; $9.75.

"This type of experimentation with subject matter and arrangement is to be highly lauded. Optics is so well developed and the concreteness is so great that it makes an excellent alternative to Newtonian mechanics as a starting point for introductory students. I especially enjoyed the clarity and forcefulness of the diagrams." — Edwin F. Taylor, Massachusetts Institute of Technology.

Momentum Books

Published for the Commission on College Physics. General Editor: Walter C. Michels, Bryn Mawr College.

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ers, Zener diodes, silicon-controlled rectifiers and four-layer diodes, unijunction and field-effect transistors are discussed in a short and well established manner.

Chapter 6 is reserved for equivalent circuits, the interrelationship of transistor parameters and for the basic parameters occurring in actual circuit evaluations. The next chapter deals with dc operating conditions and transistor biasing. At this point actual circuits can be treated. He then analyzes low-level, low-frequency amplifiers, discusses gain control and feedback in the usual manner and states some facts on low-noise circuits. In the second part of this chapter some detailed circuits are given. Following the same lines the author discusses in chapter 9 problems of high-power audio amplifiers. The equivalent circuits of transistors are modified in chapter 10 for the high-frequency amplifier case. The author then deals with the single- and double-tuned high-frequency amplifier and briefly also with very-high-frequency and pulse amplifiers.

In chapter 11 standard sinewave and relaxation oscillators are considered. A very short chapter 12 describes some receiver circuits. Transistors as switches are the subject of the next section covering simple on-off switches, trigger circuits, counters and the basic logic elements. Problems of dc amplifiers, of power supplies and inverters are treated in the next two sections. Due to the clear descriptions and drawings a very good introduction into the field of integrated circuits follows. Most recent developments in the field of solid-state electronics, such as the MOS transistor, thin-film transistor, laser diode and semiconductor microphone are dealt with in the last chapter.

As a whole Hibberd's book will be a good introduction for technicians, explaining transistor techniques in a language a reader with almost no mathematical and physical background can understand. The chapters dealing with the general topics and the basic material are very well composed and written, thus suitable for the purpose intended. The chapters on some applications, such as oscillators, high-frequency and dc amplifiers and transistor switching are too short to serve as more than a review on how these problems are solved in principle. The technician working in an electronics laboratory will better understand what's behind transistors and transistor circuitry after having read Hibberd's book.

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More physics for engineers

MODERN PHYSICS FOR ENGINEERS. By Otto Oldenberg, Norman C. Rasmussen. 477 pp. McGraw-Hill, New York, 1966. $9.95

by Peter L. Balise

Because tomorrow's engineering utilizes today's physics and mathematics, engineering curricula place increasing emphasis on these disciplines. Engineering courses contain more physics and mathematics than they did just a few years ago, and there is more engineering interest in modern physics courses. The authors are well qualified to write an appropriate text; Otto Oldenberg is associated with the Air Force Cambridge Research Laboratories and is an emeritus professor of physics at Harvard, while Norman Rasmussen is a professor of nuclear engineering at MIT.

The book can be succinctly described as an adaptation of *Introduction to Atomic and Nuclear Physics,* by the senior author. The first chapter is a brief and lucid introduction to the Lorentz transformation. Otherwise, the first half of the text consists of the first five parts of the older book without substantial change except for the omission of physical-chemistry material and the addition of modern topics such as three pages on the maser and laser (too brief for this engineer's taste).

The chapter on the solid state has been rewritten to give much more related to semiconductors, as well as notes on other topics of potential engineering importance, such as superconductivity. The last part, on nuclear physics, has been greatly expanded and rewritten. The treatment of radioactive decay and nuclear reactions seems a good summary, but there is less attention than might be desired to topics that are presently more esoteric than practical, such as antimatter. Interaction of radiation with matter is well covered. There are also reviews of nuclear power and radioisotope applications.

As in the earlier book, the writing is marked by descriptive clarity, with mathematical arguments generally relegated to carefully composed problems (with answers). Where applicable, the problems are those of the earlier text. The book very well fulfills its title.

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The reviewer is a professor of mechanical engineering at the University of Washington, in Seattle.

Not too advanced

INTRODUCTION TO MATRICES AND LINEAR TRANSFORMATIONS. (Second ed.) By Daniel T. Finkbeiner II. 297 pp. Freeman, San Francisco, 1966. $7.75

by Dagmar Henney

The second edition of Daniel Finkbeiner's book presents a lucid introduction to matrix theory, linear transformations and the theory of linear algebra. The author presents ideas in linear algebra effectively with the help of matrices. The first half of the book discusses abstract algebraic systems, vector spaces, linear operators, matrices and determinants. An early introduction of the dual space provides an effective means for investigating the transpose and adjoint of a linear operator and for describing primal and dual problems of linear programing. The second part contains a treatment of metric concepts, which includes Hermitian functions and normal transformations. Another chapter covers combinatorial equivalence to a deeper extent than in the first edition.

Though this particular book is not written on the same advanced level as, for example, Greub's *Linear Algebra* or Nering's *Linear Algebra and Matrix Theory,* the reviewer recommends it as a text for the undergraduate or beginning graduate student.

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The reviewer is associate professor of mathematics at George Washington University.