

Optics Baedeker

APPLIED OPTICS: A GUIDE TO OPTICAL SYSTEM DESIGN, VOL. 1. By Leo Levi. 620 pp. Wiley, New York, 1968. \$18.95

by J. A. GIORDMAINE

Everyone undertaking the design of optical experiments or the engineering of an optical system finds himself consulting a wide variety of references for results of diffraction and communication theory, for lens designs, the spectra of flash lamps and a multitude of other matters. This unusual and very useful book, which succeeds in being both an introductory text and a valuable reference book, simplifies the job of information retrieval by collecting in one source many of the basic theoretical tools of optics, together with a systematic collection of information and data on lenses, prisms, mirrors and light sources.

Leo Levi, a member of the physics department of the City College of New York, has done an excellent and painstaking job of integrating basic theory with carefully selected data and technical information. The result is a reference work of lasting value, but also, "mirabile dictu," a well written and readable book in which opticists and experimental physicists will enjoy browsing for introductions to other areas of an interdisciplinary field.

The first third of the book is a self-contained survey of the fundamentals of physical optics, communication-theory aspects of optical imaging, the quantum nature of light, radiometry, photometry and colorimetry. The technical level is that of seniors or beginning graduate students; the physical content of equations and theory is emphasized throughout.

In the second third is a summary of the characteristics of light sources—the sun, incandescent and discharge lamps, luminescence and phosphors, and lasers, with many convenient tables and diagrams of spectra, output power, efficiencies, pulse durations, frequency response and other properties.

The final third of the book is devoted to the theory and practice of lenses, prisms and mirrors. Included

in addition to the standard physical and geometrical optics is useful material on thin films, reflecting coatings, tolerances on surface quality, optical transfer functions, wave optical analysis of lens systems and numerous examples of important lens designs. The reader will also find here answers to such questions as: what performance to expect from standard inexpensive optical components, how to clean aluminum mirrors, and how to synthesize systems of multiple mirrors and prisms.

Levi does not discuss the detection of light, a subject to be covered in a projected second volume. The electrooptic effect, modulation, holography and nonlinear optics are treated only sketchily. A surprising omission is the theory of propagation of gaussian beams. The author does, however, include carefully selected references to review articles and books covering these fields. The book is well de-

signed, and it has an excellent index.

This book is a needed and valuable contribution to the optics literature and should have a long and useful life. We can look forward to the second volume.

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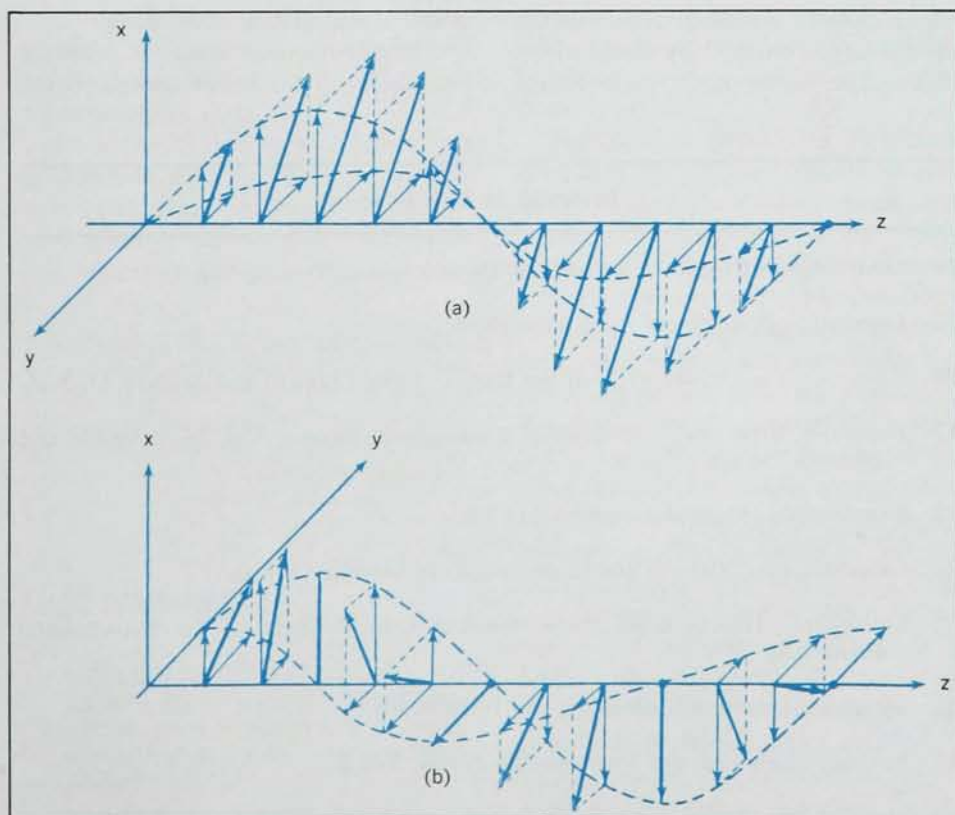
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Compared to Kittel

PRINCIPLES OF SOLID STATE PHYSICS. Robert A. Levy, ed. 464 pp. Academic Press, New York, 1968. \$11.50

by ROBERT J. COLLIER

"Reject nothing but reorder all" (Theodore Reuthke) is pretty good advice.



LINEARLY POLARIZED LIGHT (a) and circularly polarized light (b) for a simple monochromatic plane wave. (From *Applied Optics: A Guide to Optical System Design, Vol. 1*, by Leo Levi. Reviewed on this page.)