density and expansion of the universe; how an intense gravitational field warps both time and space; how the singular condition of black holes is reached; descriptions of black holes with charge and spin and those which evaporate; a discussion of quasars and their mysterious engines of energy transmission.

The text is full of apt analogies which make these difficult concepts more understandable to a popular audience. The many drawings and photographs, particularly the color plates, also complement the narrative.

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Introduction to Applied Solid State Physics: Topics in the Applications of Semiconductors, Superconductors, and the Nonlinear Optical Properties of Solids

R. Dalven
340 pp. Plenum, New York, 1980. $27.50.

This is a textbook aimed at senior undergraduates and first-year graduate students interested in solid-state devices. It emphasizes the basic physical principles on which the devices are based and shuns the engineering details. *Introduction to Applied Solid State Theory* surveys a fairly large number of devices, but is by no means exhaustive. Magnetic materials and devices are, for example, omitted altogether. The book is based on a course given three or four times during the past decade by the author, Richard Dalven, at the University of California in Berkeley. The author found at Berkeley a sizeable number of students interested in obtaining a survey of solid-state electronic devices and of the physical concepts on which they are based but who did not want mathematical rigor or the engineering details. The book presupposes a knowledge of introductory solid-state physics and electromagnetic theory.

The first two thirds of the book (a little over 200 pages) deals with semiconductors. After a review of semiconductor physics and of the physics of p-n junctions, Dalven gives a description of diodes and transistors. Next, he discusses the physics of metal-semiconductor and metal-oxide-semiconductor junctions, on which charge-coupled devices and MOSFET's are based. Photoemission, photoconductivity, photovoltaic devices, radiation detectors, solar cells, light emitting diodes and lasers conclude the review of semiconductor applied physics. The last two chapters,

constituting the last one-third of the book, are essentially unrelated to the first part and to each other. A discussion of Josephson junctions and superconducting devices occupies a little over 40 pages, while the rest is devoted to nonlinear optical properties and parametric optical devices.

Most of the chapters are easy to read, illustrated by numerous helpful figures and uncluttered by unnecessary algebra. Unfortunately, the last chapter is somewhat less successful in this respect. The heavier dose of algebra tends to obscure the simple physical ideas of parametric optical processes. This chapter also contains some disturbing inaccuracies. On page 264 the statement appears:

> "We are therefore neglecting the anisotropy of real crystals and confining ourselves to a discussion of second-order non-linear effects in a hypothetical isotropic dielectric solid. (Strictly speaking, an isotropic optical medium cannot have a second-order non-linearity)."

On page 274 the reader finds a table with the cubic, isotropic dielectric materials GaSb, GaAs and GaP used in second harmonic generation. The student may be confused. On pages 277 and 278 an erroneous (and unnecessary) argument is used to prove that div $\mathbf{E} = 0$ in a nonlinear medium. There may well be longitudinal components of the second harmonic nonlinear polarization and electric field.

I recommend the book for undergraduates and beginning graduate students who desire an introductory survey of the world of solid-state applications. Those interested in more advanced study or research should consult the reading lists and extensive references which are provided at the end of each chapter.

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Einstein books

The following is a survey of eight recent books on Einstein: **Albert Einstein: His Influence on Physics, Philosophy and Politics.** P. C. Aichelburg, R. U. Sexl, eds. 220 pp. Vieweg, Braunschweig, Fed. Rep. Germany, 1979. DM 48; **Albert Einstein, The Human Side: New Glimpses from his Archives.** H. Dukas, B. Hoffmann, eds. 167 pp. Princeton U., Princeton, N.J., 1979. $8.95; **Albert Einstein: Autobiographical Notes.** P. A. Schlipp, ed. 89 pp. Open Court, LaSalle and Chicago, Ill., 1979. $9.95; **Einstein: A Centenary Volume.** A. P. French, ed. 332 pp. Harvard U., Cambridge, Mass., 1979. $20.00; **General Relativity: An Einstein Centenary Survey.** S. W. Hawking, W. Israel, eds. 919 pp. Cambridge U., New York, 1979. $74.50; **Albert Einstein's Theory of General Relativity: 60 Years of its Influence on Man and the Universe.** G. Tauber, ed. 352 pp. Crown, New York, 1979. $14.95; **Albert Einstein, 1879–1955: A Centenary Exhibit of Manuscripts, Books, and Portraits Selected from the Humanities Research Center Collections.** A. C. Lewis. 40 pp. Humanities Center, U. Texas at Austin, Austin, Texas, 1979. $6.75; **Images of Einstein: A Catalog.** J. N. Warnow, ed. 77 pp. Center for History of Phys., Amer. Inst. Phys., New York, 1979. $10.00.

The centennial of a celebrated person's birthyear has often been the occasion for the publication of numerous books focusing on that person and 1979—the year of Albert Einstein—was no exception. The reader will find, in the eight books under review, a feast of Einsteiniana: excerpts from published writings and private correspondence, assessments of his contributions