that is well planned, well written and well produced.

* * *

*Julius Miklowitz is a professor of Applied Mechanics at the California Institute of Technology. During the last 15 years he has published 35 papers in the area of waves in solids.*

## Cosmic Rays at Ground Level

**A. W. Wolfendale, ed.**
233 pp. Institute of Physics, London, 1973. $12.00

Arnold W. Wolfendale, for many years a leader in research to determine the precise momentum spectrum of energetic cosmic-ray muons deep in the atmosphere, has organized a very useful "festschrift" in honor of George D. Rochester, FRS, whose retirement occurred this year. The shock is that Rochester has been retired, a victim of an undiscriminating system that dictates age 65 as the most probable end of academic capability. One can only hope that he now will have more time to enjoy his research and continue to contribute to advancement of understanding of the ultrahigh energy radiation provided by nature. Rochester's discovery in 1947 (in collaboration with Clifford C. Butler) of the first "strange" particles—the so-called V-particles that were the unstable heavies among cosmic-ray shower secondaries—certainly gave rise to the succeeding great revolution in elementary-particle physics and a large number of Nobel Prizes connected with it.

Wolfendale and many of his colleagues presently (or lately) at the Universities of Leeds and Durham, including several former students of Rochester, have compiled a series of reviews and reports covering the nature of the primary cosmic radiation, the composition and spectrum of the sea-level particle radiation, muon and electron-neutrino physics, searches for quarks, magnetic monopoles and tachyons, extensive air showers (much of the shower work being done at Haverah Park in Yorkshire, an observatory that Rochester helped to create) and some details of special observational techniques developed to a high degree of precision at Durham (including magnetic cloud-chamber spectrometers and neon flash-tube detector arrays).

As is unavoidable in the case of such a compendium, the style and coverage are uneven, but the level of performance is generally good throughout. The authors have mostly succeeded in giving a broad and nonparochial view of their various topics; most of the ref-

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*By* Jerry B. Marion *and* Ronald C. Davidson, *both of the University of Maryland.*
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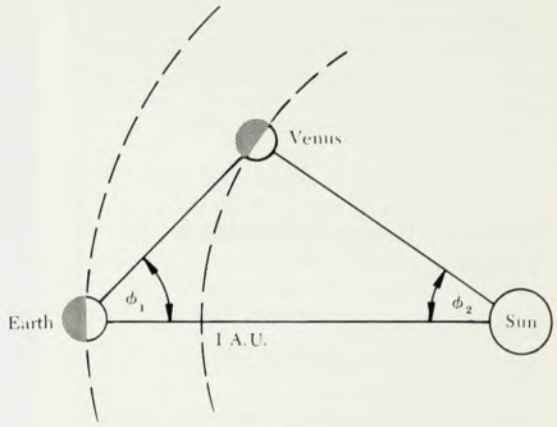


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*230 pages. Illustrated. Soft Cover. $4.75. February 1972. Order code 6070.*

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*By* John S. Blakemore, *Florida Atlantic University, Boca Raton.*
*About 400 pages, 200 illustrations. About $15.00. Ready March. Order code 1701.*

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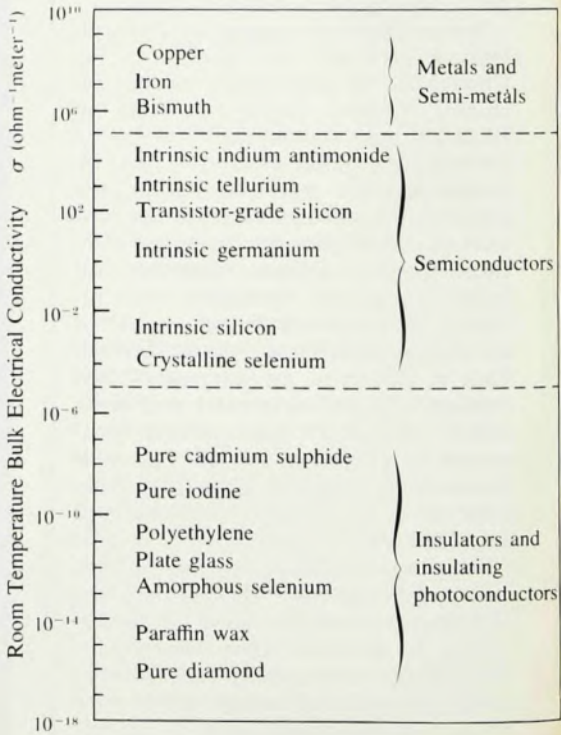

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*By* Elske V.P. Smith, *Univ. of Maryland, and* Kenneth C. Jacobs, *Univ. of Virginia.*
*564 pages. 284 illustrations. $15.95. July 1973. Order code 8387.*

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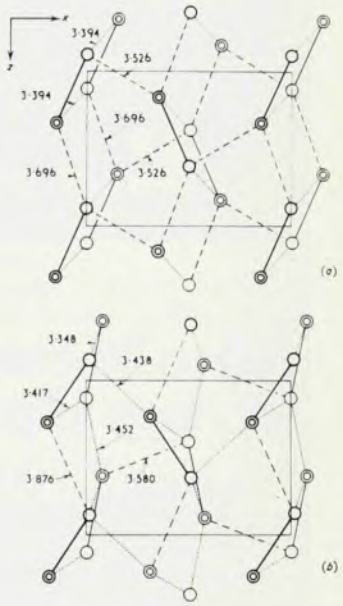
*By* Helen D. Megaw, *Univ. of Cambridge, England.*
*563 pages. 208 illustrations. $19.50. July 1973. Order code 6260.*

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*By* A. James Diefenderfer, *Lehigh University.*
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*Manual: 375 pages. 257 illustrations. Soft Cover. $7.50. April 1972. Order code 3072.*

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erence lists are very comprehensive and take us well through the 1972 literature. Actually this collection of articles would be a good choice for bright intermediate graduate students who wish to get a fairly comprehensive insight into problems of concern to cosmic-ray researchers. The emphasis is that of physicists of the British Midlands, who have contributed so importantly to our current state of understanding, and, in the spirit of George Rochester, their reports have related very clearly and unselfishly to the parallel work done at other places in the world. The publisher has done a handsome production job as well.

ROBERT L. CHASSON
*University of Denver*
*Denver, Colorado*

## Physics of Atoms and Molecules

**U. Fano, L. Fano**
592 pp. U. of Chicago Press, Chicago, Ill. 1973. $14.50

As evidence by a burgeoning number of new and occasionally novel physics textbooks, the past several years have seen a marked overhaul in the undergraduate physics curricula of many colleges and universities. Although the most noticeable course-content revisions have been established at the introductory level and in courses designed for nonphysics majors, significant changes also have occurred in the advanced-undergraduate course sequences.

In the undergraduate curriculum it has been customary to include a survey course on modern physics as a prerequisite to formal quantum-theory courses. The long list of recent modern-physics texts and elementary quantum-mechanics texts suggests that the evolution of courses providing a first exposure to modern physics has been especially active. *Physics of Atoms and Molecules* by U. Fano and L. Fano deals with the quantum mechanics of isolated atoms and molecules and is intended to provide the basic ideas necessary for more advanced treatments of quantum theory and of specialized topics. In that respect, and unlike the more frenetic character of many modern-physics survey texts, this book offers an introduction to the fundamentals of quantum theory in the same way that traditional undergraduate courses in mechanics or electricity and magnetism serve as bases for analytical dynamics or electrodynamics.

Both in their design and in its realization, the Fanos have succeeded extraordinarily well. With many new, thoughtful and thought-provoking