pending on the interests of the research worker.

The reader will find here a fresh, cheerful, concise account of major crystallographic techniques, together with lots of sound and intensely practical advice. Concerning the use of a polarizing microscope, Glasser notes:

> There are two golden rules: never use a polarizing microscope without permission and never make an adjustment to it unless you are quite sure you know what you are doing. Neglect of these two simple rules can result in quite extraordinary amounts of ill-will.

Glasser emphasizes the physical or geometrical basis for each technique, and rarely provides a formal derivation of a result. The drawings are numerous and clear, the freedom from typographical errors is commendable, and I noted only one factual error: a wrong identification of the transition giving rise to the $K\alpha_2$ line in the x-ray spectrum of an element.

Glasser omits or merely mentions many topics that we might expect to find. She provides only a handful of problems, hidden in the captions to figures. Almost no reference is made to work published since 1970. Glasser allotts only a few scattered paragraphs to single-crystal diffractometers and omits entirely modern direct methods of structure determination. In consequence, this book could have been written perhaps twenty years ago with only slight differences. An extensive bibliography that includes most of the better-known monographs partly remedies these omissions. Glasser's book is thus a splendid introduction, but only that.

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Electromagnetic Vibrations, Waves, and Radiation

G. Bekefi, A. H. Barrett
664 pp. MIT, Cambridge, 1977. $17.50

In one sense, George Bekefi and Alan Barrett's *Electromagnetic Vibrations, Waves, and Radiation* is a luxury, like an enticing appetizer or dessert. I cannot agree more with the authors on the prerequisite for this text—a *sound* course in the principles of electricity and magnetism. The strength of this book lies in the wealth and fascination of modern applications of electromagnetic theory. The weakness lies in the lack of solid fundamentals.

The main emphasis of the book is on "the oscillatory aspects of the electromagnetic field." So, Bekefi and Barrett treat generalities about oscillatory motion in the first two chapters. They devote the rest (six chapters) to the many facets of

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Atomic Energy Level and Grotrian Diagrams,

Vol. 2: Sulfur I - Titanium XXII

edited by S. BASHKIN *and* J. O. STONER

1978 US $80.00/Dfl. 180.00
xx + 616 pages ISBN 0-444-85149-6

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Astrophysical Letters

Magnetism and Metallurgy of Soft Magnetic Materials

by C. W. CHEN

1977 US $77.75/Dfl. 175.00
xviii + 572 pages ISBN 0-7204-0706-0

"The aim of the book is to present the physical principles that underlie the intrinsic as well as the applied properties of soft magnets. The book is intended for researchers and development workers who wish to obtain a comprehensive working knowledge of this field."

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Elementary Modes of Excitation in Nuclei

edited by A. BOHR *and* R. A. BROGLIA

1978 US $80.00/Dfl. 180.00
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The concept of elementary modes of excitation occupies a central place in the study of nuclear dynamics. The topics selected in this volume emphasize focal points of current development, concurrently illustrating general methods developed for the analysis of nuclear dynamics.

Mössbauer Isomer Shifts

edited by G. K. SHENOY *and* F. E. WAGNER

1978 US $106.75/Dfl. 240.00
xvi + 926 pages ISBN 0-7204-0314-6

This volume is the combined effort of specialists in physics to provide a comprehensive discussion of the isomer shift and its uses in studies of the electronic structure of chemical compounds and metallurgical systems, as well as of nuclear structure. In his foreword to the book, **Professor R. L. Mössbauer** expresses the hope that *"it will not only serve as a reference manual for newcomers and experts in the field, but that it may also stimulate new ideas and developments."*

Progress in Optics, Vol. 15

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by C. LEHMANN

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Physics Bulletin

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by H. P. J. HAKEN

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Physics Bulletin

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by R. M. A. AZZAM *and* N. M. BASHARA

1977 US $80.00/Dfl. 180.00
xiv + 532 pages ISBN 0-7204-0162-3

"There is much to praise... in this volume. In the first chapter different representations of the polarization state of a beam of light were well presented and I was particularly impressed by the use of the complex plane as an alternative of the Poincaré sphere approach... I would recommend this book to anyone working in the field of ellipsometry."

Optica Acta

Weak and Electromagnetic Interactions at High Energy:

Les Houches Session XXIX

edited by R. BALIAN *and* C. H. LLEWELLYN-SMITH

1977 US $84.50/Dfl. 190.00
xxvi + 670 pages ISBN 0-7204-0742-7

This book presents a complete and thorough review of the experimental and theoretical situation in particle physics up to now. It is written in a way which is both pedagogical and progressive, and is easy to read. This incomparable survey of the most recent progress made in the field is indispensable to all particle and high energy physicists.

Frontiers in Laser Spectroscopy:

Les Houches Session XXVII

edited by R. BALIAN, S. HAROCHE *and* S. LIBERMAN

1977 US $124.50/Dfl. 280.00 (2-volume set) 930 pages (in 2 volumes)
ISBN 0-7204-0698-6

"These lectures form a coherent and well-presented review of a physically well-defined area... one of the topics which ensures adequate funding, namely isotope separation, is admirably discussed by Letokhov."

Nature

Nonlinear Spectroscopy:

"Enrico Fermi", Course LXIV

edited by N. BLOEMBERGEN

1977 US $66.75/Dfl. 150.00
488 pages ISBN 0-7204-0568-8

"This course on nonlinear spectroscopy is a worthy successor to other laser and maser courses... As with the other courses, these proceedings have been carefully edited and assembled into a coherent volume... This book thus forms a very useful vehicle for someone who is a specialist in one of the topics in the course to widen his horizons..."

Physics Bulletin

Quantum Liquids

edited by J. RUVALDS *and* T. REGGE

1978 US $37.75/Dfl. 85.00
Paperback: US $22.25/Dfl. 50.00
x + 328 pp. ISBN 0-444-85117-8
Paperback ISBN 0-444-85152-6

The exciting developments in these studies of the superfluid phases of the ^{3}He system, which obeys Fermi statistical laws, form the principal topics in this volume. Those concerned with aspects of low temperature physics involving superfluidity and quantum liquids will find the 10 lectures presented in this volume both lucid and enlightening.

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the electromagnetic field. Though the chapter titles are deceptively old-fashioned, the contents are refreshingly modern. Other laudable aspects include the examples, which tend to be physically interesting and relevant, unlike the more common, mathematically oriented cases. Furthermore, Bekefi and Barrett provide quite a few completely worked-out problems, illustrating the test in question. References to more detailed treatments are abundant. The use of MKS units is helpful to the majority who are "brought up" with them. Factors in formulae are sometimes labelled by words (for example, 8.62) that help the conceptual understanding of the various pieces. One of the appendices is a complete listing of a FORTRAN program to simulate the motion of a charged particle in a certain electromagnetic field. It will surely be a helpful tool in teaching. Unfortunately, it cannot be modified to accommodate general fields because the program plots the analytic solution rather than solves the equations of motion.

My reservations about this book lie mainly in two aspects: the lack of special relativity and the presence of conceptually misleading information. I can see that relativity is not applicable to the most common experiences. Yet, the electromagnetic wave is never non-relativistic. Apart from this complaint, relativistic examples *are* dragged in, without warning and with relativity taken for granted! Perhaps the authors expect the students to have been introduced to relativity in a previous "semester of mechanics and ... electricity and magnetism."

Apart from simple misprints and mistakes (for example, "the electric field ... one meter from a point charge of one coulomb will equal one newton per coulomb" on page 191), the book contains several unfortunate remarks that, I believe, could send students astray. As examples, I raise two specific points here. On page 303, Bekefi and Barrett strongly suggest that the two degrees of freedom associated with electromagnetic waves are the electric field and the magnetic field. A mode associated with a degree of freedom can be excited *alone*. For an electromagnetic wave, it would be difficult to have only the electric field be non-zero. On page 233, between equation (3.102) and the next, any ordinary mortal student would take the word "superposition" as a principle for the Poynting vector. On further analysis, it is clear that two Poynting fluxes can be superposed if the electric (and magnetic) field of one is parallel to the magnetic (and electric) field of the other. In the book's example, this is the case and, so, the equations are true. For the sake of "mathematical unsophistication," the authors have gone, perhaps, too far. There are other dangerous situations in which they issue no warning concerning the uniqueness of the case. The user should be wary of the "obvious" and tempting generalizations. A new edition should take the student along a less precarious path.

To summarize, I would recommend this text to those who have already developed a clear picture of electricity and magnetism and who have built a strong foundation in its understanding. As a resource book to supplement the usual dull treatment of electricity and magnetism, it is excellent. I doubt, however, that *typical* physics majors would have a whole semester to dwell on these fascinating applications *in addition* to solidifying the groundwork on electricity and magnetism. Given the time and quality of students, I would prefer to use the more "old-fashioned" Feynman lectures. The latter, in a different sense, are also luxury items.

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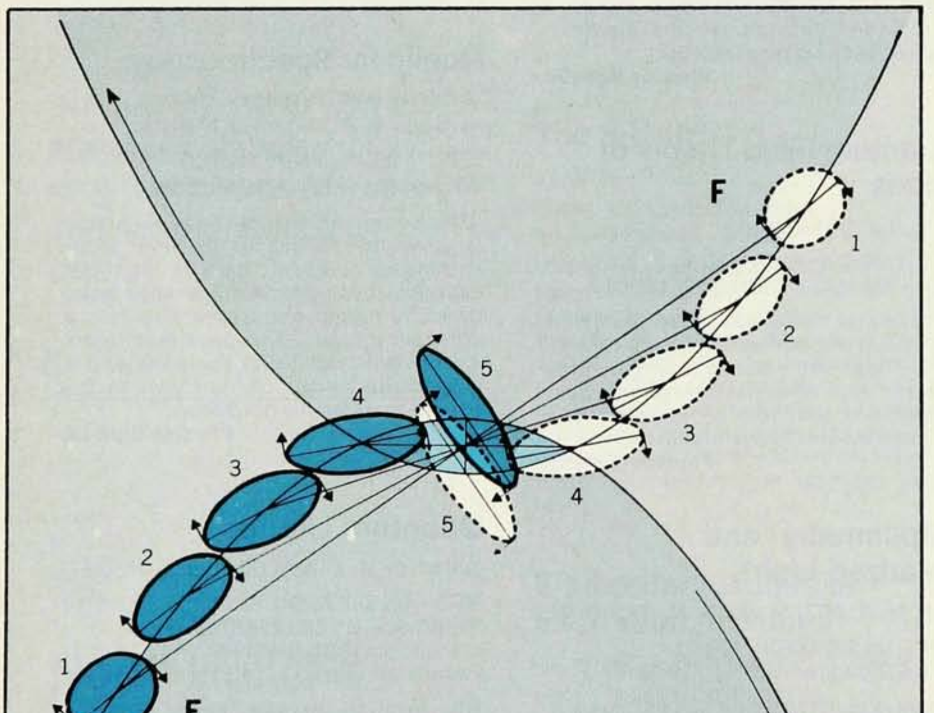
Planets and Planetarians: A History of Theories of the Origin of Planetary Systems

S. L. Jaki
266 pp. Halsted (Wiley), New York, 1978. \$16.95

Planets and Planetarians is the first book to trace the history of ideas on the formation of planetary systems from the time the subject was first discussed among the ancient atomists to the present day. As a synthetic history of ideas it is an ambitious and laudable attempt of a kind more often needed; it compares, analyzes and criticizes the theories as they appear in the primary sources. The book concentrates on the crucial assumptions and basic problems in each theory rather than on mathematics, and may be understood easily by the non-scientist interested in the history of scientific ideas.

Stanley L. Jaki is an historian of science who has written extensively in the history of cosmology and physics. With an impressive mastery of the primary sources in Latin, French, German and English, he details the classical Epicurean and Lucretian vision of the evolution of worlds through the random coalescence of atoms; Kepler's Platonic search for a geometric order among planetary distances; Descartes's vortex cosmology resulting from the mechanical interactions of particles subject to specific laws of nature; and Newton's censure of Cartesian vortices based on his own physical laws and on the



A planetary system would evolve, according to the American geologist Thomas Chrowder Chamberlin, from a spiral nebula produced after the near approach of two stars. The diagram above, which originally appeared in the *Astrophysical Journal*, **14**, 35 (1901), shows the increasing elongation and speed of rotation of the two stars during such an encounter. Stanley L. Jaki discusses the cosmogonies of Chamberlin and others in his *Planets and Planetarians*, reviewed on this page.