Part of the value of the book lies in the chapters or appendices that complement central articles (discussed below). For example, the book includes an excellent chapter on nuclear structure as it relates to Mössbauer isomer shifts. In addition, there are chapters dealing with conversion-electron spectroscopy, optical isotope shifts and muonic atoms—techniques that can also provide information about charge-density distributions in condensed media. Pressure effects, isomer-shift changes at phase transitions, and matrix-isolation studies are treated in individual chapters. Motivation for studying matrix-isolated species lies in the unfulfilled quest for a resonant species in a rigorously defined electronic state. The appendices provide useful compilations of Mössbauer nuclide properties, common and reference isomer shifts, tabulated factors relating to isomer-shift analyses and even a table of source-preparation reactions. The volume is durably bound, as it should be at the price.

Because of the numerous chapters, it is not possible to describe their contents in detail. It is useful, however, to give some feeling for the organization and utility of the text. From the outset, it should be noted that the emphasis is upon physical principles and concepts underlying the isomer-shift variations. A large amount of tabular isomer-shift data is naturally available in the text, but it is not a catalog of such information; this applies particularly to the popular Fe^{57} isotope, which is treated in a chapter that reflects the uniformly high quality of authorship in the volume.

The text begins with a useful introductory chapter followed by others dealing with the theory of isomer shifts, their experimental determination and a very complete chapter detailing current methods of computing electron densities in free atoms and in condensed phases. These chapters may be read with profit by graduate students or others interested in hyperfine interactions in the context of Mössbauer spectroscopy. They also provide background and common formulas that are briefly referred to in later chapters; the latter are otherwise self-contained. The authors are recognized, active scientists, and most are condensed-matter physicists who write from this viewpoint. There is an excellent balance in the materials coverage between metals and alloys, and ionic or covalent compounds. The overall treatment is comprehensive in that all available information for all studied isotopes has been surveyed by the various authors.

The price of the volume is sufficiently high that an individual will weigh its long-term use carefully before making the expenditure. The book, however, certainly belongs in condensed-matter libraries as a reference.

In conclusion, we comment briefly on the state of the art in isomer-shift measurements as projected by this volume. The overall picture is of interest to nonexperts in the field and is addressed but briefly in the introduction and in isolated points in the various chapters. This is probably because of the variety of isotopes and levels of sophistication available for calculating electron densities. Thus, it is not possible to answer the question, "How useful, accurate and accessible is the Mössbauer isomer-shift measurement as a determinant of electron density?" without defining the context of the isotope and the material under study. Qualitatively, it turns out that in the limits of ionic configurations, electronegativity trends, well-defined bonding states and so on, the observed shifts can often be interpreted as loss or gain of valence s electrons or shielding by d or other non-s valence electrons. In this connection, early papers by L. R. Walker, G. K. Wertheim and V. Jaccarine, D. A. Shirley, and others have become classical references with the appearance of this volume. But more recent work has revealed many additional mechanisms, often of similar magnitudes, that must be understood before a complete picture is possible. This is especially true in metals, alloys and covalent materials. So, at this time, it is probably fair to say that routine (even occasional) interpretation of isomer shifts as accurately known electron-density changes at the nucleus remains a goal rather than an achievement. Experiment still outpaces theory, but there is ample evidence in this volume that the gap between accurate computations of electron densities and their experimental determinations is narrowing. In any case, it must be remembered that whatever the material, Mössbauer isomer shifts for a wide variety of elements are uniquely able to reflect both classical chemical-bond trends and more devious trends. This fact will continue to stimulate further calculation and experiment, and such work will owe a debt to the present authors and editors for providing clear guideposts at this time.

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book notes

McGraw-Hill Dictionary of Physics and Mathematics. D. N. Lapedes, ed. 1074 pp. McGraw-Hill, New York, 1978. $22.50

This dictionary defines more than 20 000 terms in physics, mathematics, and related disciplines such as statistics, astronomy, electronics and geophysics. More than 600 halftones and line drawings help to clarify many terms. The

appendix includes conversion tables for the International System of Units; properties of the elements; mathematical notations and special constants; electronic and semiconductor symbols and abbreviations, and tables of data on the planets, stars and asteroids.

Scientific Information Transfer: The Editor's Role (Proc. of the First Int. Conf. of Scientific Editors, Jerusalem, April 1977). M. Balaban, ed. 686 pp. Reidel, Boston, 1978. $34.50

Miriam Balaban, the conference chairman, writes in her preface that "this volume is . . . dedicated to the diverse aspects of editing towards advancing scientific information transfer—technical and sociological norms and practices, quality, refereeing and judgment, impact of new mechanical and organizational techniques, copyright, standards and style, economics, society and commercial publishing, primary–secondary–tertiary literature and their interfaces, and the philosophy and sociology of science." Balaban observes that the book should be of interest to full or part-time scientists–editors and technical scientific editors of all sorts.

Nicholas Copernicus: On the Revolutions. J. Dobrzycki, ed. 450 pp. Johns Hopkins U.P., Baltimore, 1978. $67.50

This new English translation of Copernicus's *De revolutionibus orbium coelestium* (1543) is part of the Polish Academy of Sciences project of publishing the complete works of this famous astronomer. Volume I (1972) made available the facsimile of the original *Revolutions* manuscript; volume II (of which the current book is a part) presents a critical edition with extensive commentary of Copernicus's masterpiece, and volume III will contain his shorter astronomical treatises and his writings on other subjects. Six versions (Latin, Polish, Russian, English, French and German) of each volume will appear. Edward Rosen, who prepared this new translation, states that he "has not followed the earlier rendering by the late Charles Glenn Wallis (*Great Books of the Western World*, volume 16, Chicago, 1952) in so drastically modernizing the text of Copernicus as to make its resemblance to the original difficult to discern." —CBW

new books

Particles, Nuclei and High-Energy Physics

Relativistic Quantum Fields. C. Nash. 223 pp. Academic, New York, 1978. $31.00

Experimental Status and Theoretical Approaches in Physics at High Energy Accelerators (Proc. of the 3rd and 4th Institute of Particle Physics Int. Schools, McGill Univ., Montreal, June 1975 and June 1976). R. Henzi, B. Margolis, eds. 689 and 742 pp. McGill Univ., Montreal, 1975 and 1976. $25.00 and $30.00

Theoretical Methods in Medium-Energy and Heavy-Ion Physics (Proc. of a NATO Advanced Studies Institute, University of Wisconsin, Madison, June 1978) (NATO Advanced Study Institutes Series, Series B (Physics), Vol. 38). K. W. McVoy, W. A. Friedman, eds. 749 pp. Plenum, New York, 1978. $65.00

Superheavy Elements (Proc. of the Int. Symp., Texas Tech Univ., Lubbock, March 1978). M. A. K. Lodhi, ed. 583 pp. Pergamon, Elmsford, N.Y., 1978. $55.00

Atomic, Molecular and Chemical Physics

Table of Isotopes, 7th edition. C. M. Lederer, V. S. Shirley, eds. 1523 pp. Wiley-Interscience, New York, 1979 (first edition, 1940). $40.00 clothbound, $26.25 paperbound

Polymer Stress Reactions, Vol. 2 (Experiments). A. Casale, R. S. Porter. 342 pp. Academic, New York, 1979. $32.00

Analytical Laser Spectroscopy (Chemical Analysis Series, Vol. 50). N. Omenetto, ed. 550 pp. Wiley-Interscience, New York, 1979. $34.95

Progress in Reaction Kinetics, Vol. 8. K. R. Jennings, R. B. Cundall, eds. 305 pp. Pergamon, Elmsford, N.Y., 1978. $37.50

Optics and Acoustics

Handbook of Acoustical Enclosures and Barriers. R. K. Miller, W. V. Montone. 250 pp. Fairmont, Atlanta, 1978. $29.95

Electricity, Magnetism and Fields

1978 Applied Superconductivity Conference (Proc., Pittsburgh, September 1978) (*IEEE Transactions on Magnetics*, Vol. MAG-15, No. 1). S. J. St. Lorant, ed. 917 pp. The Institute of Electrical and Electronics Engineers, New York, 1979. $17.50 for members, $35.00 for nonmembers

Crystallography, Low-Temperature and Solid-State Physics

The Molten State of Matter: Melting and Crystal Structure. A. R. Ubbelohde. 454 pp. Wiley-Interscience, New York, 1978. $58.95

Patterns in Crystals. N. F. Kennon. 197 pp. Wiley, New York, 1978. $25.00 clothbound, $12.50 paperbound

Hydrogen in Metals II: Application-Oriented Properties (Topics in Applied Physics, Vol. 29). G. Alefeld, J. Völkl, eds. 387 pp. Springer-Verlag, New York, 1978. $43.00

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Theory of Rotating Stars (Series in Astrophysics, Vol. 1). J.-L. Tassoul. 506 pp. Princeton U.P., Princeton, N.J., 1978. $40.00 clothbound, $15.00 paperbound

Mare Crisium: The View from Luna 24 (Proc. of the conf. on Luna 24, Houston, December 1977) (Supplement 9 to the journal *Geochimica et Cosmochimica Acta*). R. B. Merrill, ed. 709 pp. Pergamon, Elmsford, N.Y., 1978. $40.00

Effective Astronomy Teaching and Student Reasoning Ability. D. Schatz, A. Fraknoi, R. R. Robbins, C. D. Smith. 186 pp. Astronomical Society of the Pacific, 1290 24th Ave., San Francisco, Calif. 94122, 1978. $6.50

Who Goes There? The Search for Intelligent Life in the Universe. E. Edelson. 196 pp. Doubleday, Garden City, N.Y., 1979. $8.95

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General Physics with Bioscience Essays. J. B. Marion. 555 pp. Wiley, New York, 1979. $18.95

Theory and Mathematical Physics

Principles of Advanced Mathematical Physics, Vol. 1. R. D. Richtmyer. 422 pp. Springer-Verlag, New York, 1978. $19.80

Unitary Group Representations in Physics, Probability and Number Theory (Mathematics Lecture Note Series, Vol. 55). G. W. Mackey. 402 pp. Benjamin/Cummings, Reading, Mass., 1978. $31.50 clothbound, $19.50 paperbound

Foundations of Mechanics, 2nd edition. R. Abraham, J. E. Marsden. 806 pp. Benjamin/Cummings, Reading, Mass., 1978 (first edition, 1967). $39.50

Instrumentation and Techniques

Radiometric Calibration: Theory and Methods. C. L. Wyatt. 200 pp. Academic, New York, 1978. $21.00

Advances in Electronics and Electron Physics, Vol. 47. L. Marton, ed. 346 pp. Academic, New York, 1978. $36.00

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The Maximum Entropy Formalism (Proc. of a conf., MIT, May 1978). R. D. Levine, M. Tribus, eds. 498 pp. MIT, Cambridge, 1979. $22.50

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Energy and Environment

Wind Power and Other Energy Options. D. R. Inglis. 298 pp. Univ. of Michigan, Ann Arbor, 1978. $16.00 clothbound, $8.50 paperbound

Nuclear Energy and Alternatives (Proc. of the Int. Scientific Forum on an Acceptable Nuclear Energy Future of the World, Ft. Lauderdale, Fla., November 1977). O. K. Kadiroğlu, A. Perlmutter, L. Scott, eds. 730 pp. Ballinger (Lippincott), Cambridge, Mass., 1978. $35.00