

ture elements will have fantastically short half-lives—new methods of identifying them will have to be invented in the short time available to examine them."

This book should find a special welcome in high-school libraries.

Electromagnetic Scattering, Volume 5. Conf. Proc. (Potsdam, N.Y., 1962). Milton Kerker, ed. 592 pp. (Pergamon Oxford) Macmillan, New York, 1963. \$19.75.

Reviewed by H. J. Hagger, Albiswerk, Zürich, Switzerland.

The problem of electromagnetic scattering has for quite a long time aroused both theoretical and experimental interest, and has been studied over a range of wavelengths from optical frequencies well into the radio-frequency region. In the past very nice theoretical work has been done on resonance phenomena of different kinds. Mie's theory and the theory of Rayleigh and Gans may be con-

sidered classical examples in this respect. In August 1962, at Clarkson College of Technology in Potsdam, N.Y., scientists working on and interested in scattering processes gathered to discuss the problems and to interchange ideas and opinions. The result of the conference is this book, edited and presented by M. Kerker. It shows quite clearly the progress of the work done on electromagnetic scattering in the last decade, both theoretically and experimentally.

In the first part isolated particles of spherical and cylindrical cross section are considered and experimental and theoretical results are compared with classical theories, e.g., Rayleigh-Gans and Mie. In the second part light scattering in space and related polarization effects are dealt with, emphasizing phenomena in astrophysics and in the terrestrial atmosphere. In the third part papers on back-scattering of microwave radiation by dielectric and large ice spheres of particular

interest in radar meteorology, are included. The fourth part considers light scattering in solutions and by thin films. The last two sections deal with interaction in solids and liquids and multiple scattering.

As the proceedings of a conference, this book gives a review and a survey of the problems of electromagnetic scattering by regular and irregular particles; it will not and cannot be a treatise on the subject, but it happens to be a guide into the field showing what has been done, what can be done, where difficulties with model theories may arise and also, by omission, what should be done. It also shows that mathematical physics provides powerful tools for a solution of boundary-value problems of this kind. For the research worker in the field this book can be recommended, for he has the background necessary to read and to appreciate the book. For him it is both informative and stimulating.

BOOKS RECEIVED

ASTRONOMY & ASTROPHYSICS

The Origin and Evolution of Atmospheres and Oceans. Conf. Proc. (New York, Apr. 1963) Peter J. Brancazio and A. G. W. Cameron, eds. 314 pp. Wiley, New York, 1964. \$12.50.

BIOPHYSICS & MEDICAL PHYSICS

The Science of Smell. By R. H. Wright. 164 pp. Basic Books, New York, 1964. \$4.95.

CHEMISTRY & CHEMICAL PHYSICS

A Systematic Classification of Types of Intermetallic Structures. By P. I. Krip'yakevich. Transl. from Russian. 35 pp. Consultants Bureau, New York, 1964. Paper \$10.00.

ELECTRICITY & MAGNETISM

Ferromagnetic-Relaxation Theory. By Marshall Sparks. 227 pp. McGraw-Hill, New York, 1964. \$12.50.

Physics of Magnetism. By Soshin Chikazumi. 554 pp. Wiley, New York, 1964. \$15.75.

EXPERIMENTAL TECHNIQUES

High Temperature Technology. Symp. Proc. (Pacific Grove, Calif., Sept. 1963) 598 pp. Butterworths, Washington, D. C., 1964. \$18.50.

New Types of Metal Powders. Symp. Proc. (Cleveland, Ohio, Oct. 1963) Henry H. Hausner, ed. 167 pp. Gordon & Breach, New York, 1964. Cloth \$9.50; paper \$3.95.

Instrumentation in the Chemical and Petroleum Industries—1964. Symp. Proc. (Wilmington, Del., May 1964) George H. Robinson, ed. 140 pp. Plenum Press, New York, 1964. \$9.50.

Metallurgy at High Pressures and High Temperatures. Symp. Proc. (Dallas, Texas, Feb. 1963) K. A. Gschneidner, Jr., M. T. Hepworth, and N. A. D. Parlee, eds. 409 pp. Gordon & Breach, New York, 1964. Cloth \$19.50; paper \$8.75.

HANDBOOKS, TABLES, ETC.

Concise Dictionary of Atomics. Alfred Del Vecchio, ed. 262 pp. Philosophical Library, New York, 1964. \$6.00.

Atlas of Electron Spin Resonance Spectra, Volume 2. Theoretically Calculated Multicomponent Symmetrical Spectra. By Ya. S. Lebedev, V. V. Voevodskii, and N. N. Tikhomirova. Transl. from Russian. 195 pp. Consultants Bureau, New York, 1964. \$15.00.

Tables of the Velocity of Sound in Sea Water. By L. S. Bark, P. P. Ganson, and N. A. Meister. Transl. by D. E. Brown. 180 pp. (Pergamon, Oxford) Macmillan, New York, 1964. \$10.00.

HISTORY & PHILOSOPHY OF SCIENCE

Animal Chemistry. Or Organic Chemistry in its Application to Physiology and Pathology. By Justus Liebig. Transl. by William Gregory. (Reprint of 1842 ed.) 504 pp. Johnson Reprint, New York, 1964. \$14.50.

The Scientific Age. The Impact of Science on Society. By L. V. Berkner. 137 pp. Yale University Press, New Haven, Conn., 1964. \$4.00.

MATHEMATICS

Mathematical Bafflers. Angela Dunn, ed. 217 pp. McGraw-Hill, New York, 1964. \$6.50.

Elements of Abstract Harmonic Analysis. By George Bachman. 256 pp. Academic, New York, 1964. Paper \$3.45.

Finite Permutation Groups. By Helmut Wielandt. Transl. from German by R. Bercov. 114 pp. Academic, New York, 1964. Paper \$2.45.

NUCLEAR PHYSICS

The Nuclear Properties of the Heavy Elements. Vol. 1, Systematics of Nuclear Structure and Radioactivity. By Earl K. Hyde, Isadore Perlman, and Glenn T. Seaborg. 407 pp. Prentice-Hall, Englewood Cliffs, N. J., 1964. \$15.00.

Introduction to the Atomic Nucleus. By J. G. Cuninghame. 220 pp. Elsevier, Amsterdam, 1964. \$9.00.



INTERNATIONAL ATOMIC ENERGY AGENCY

I A E A Kärntner Ring 11, Vienna I, Austria

NEUTRON DOSIMETRY

Proceedings of an IAEA symposium held at Harwell, England, December, 1962. Contents: (Vol. I) Flux and spectrometric measurements; Review papers; Thermal and epithermal neutrons; Fast neutrons and neutrons of wide energy range; High-temperature operations. (Vol. II) Dosimetric measurements; Review papers; Methods and instruments for evaluation of dose; Survey measuring methods; Mixed radiation; Special topics. Calibration: Absolute measurements and intercomparisons. Neutron source standardization.

(1963) Vol. I: 653 pp., Vol. II: 615 pp.

Price per volume: In the U.S. and Canada: **\$13.00**
Elsewhere: **78s. stg.**

INELASTIC SCATTERING OF NEUTRONS IN SOLIDS AND LIQUIDS

Proceedings of a symposium held by IAEA, in co-operation with UNESCO, at Chalk River, Canada in September, 1962. Contents: (Vol. I) General problems; Experimental technique: Liquids and molecules. (Vol. II) Solids. (1963) Vol. I: 484 pp., Vol. II: 341 pp.

Price:

In the U.S. and Canada: Vol. I: **\$9.00**, Vol. II: **\$7.00**
Elsewhere: Vol. I: **54s. stg.**, Vol. II: **42s. stg.**

PLASMA PHYSICS AND CONTROLLED NUCLEAR FUSION RESEARCH

(1962 Supplement to the journal *NUCLEAR FUSION*) Proceedings of a conference held in Salzburg, September, 1961. The contents include the texts of 110 papers presented at the conference and abstracts of some 140 papers presented by abstract only.

(1962, 1963) Part 1: 400 pp., Part 2: 464 pp., Part 3: 460 pp.

Price per part: In the U.S. and Canada: **\$10.00**
Elsewhere: **60s. stg.**

SELECTED TOPICS IN NUCLEAR THEORY

Seven lectures presented at an international summer school held in August-September, 1962, in Czechoslovakia. Contents: Direct reactions; Dispersion theory of direct nuclear reactions; The nuclear shell model and its relation with other nuclear models; Electromagnetic properties of atomic nuclei; Effect of superconducting pairing correlations on nuclear properties; Some aspects of collective properties of nuclei; Weak interactions among nucleons and leptons.

(1963) 452 pp. Price: In the U.S. and Canada: **\$10.00**
Elsewhere: **60s. stg.**

METROLOGY OF RADIONUCLIDES

Precise measurement of radioactivity is the subject of 37 papers (with discussions), presented as the proceedings of an IAEA symposium, Vienna, October, 1959. Subjects: survey papers on routine radionuclide standardization; new developments in standardization; neutron-source calibration; high-intensity-source measurements; microcalorimetry; photo-multipliers; miscellaneous problems.

(1960) 480 pp. Price: In the U.S. and Canada: **\$5.00**
Elsewhere: **30s. stg.**

A catalog of IAEA publications will be sent free on request.

**Order from: NATIONAL AGENCY FOR
INTERNATIONAL PUBLICATIONS, INC.**

317 East 34 Street, New York, N.Y. 10016

Orders from outside the U.S. should be sent direct to the IAEA at Vienna.

UNIVERSITY OF COLORADO PRESS ANNOUNCES . . .

LECTURES IN THEORETICAL PHYSICS

VOLUME VI, Lectures delivered at The Summer Institute for Theoretical Physics, Univ. of Colorado, Boulder, 1963

- | | |
|---|--|
| S. Chandrasekhar | The Higher Order Virial Equations and Their Applications to the Equilibrium and Stability of Rotating Configurations |
| D. Ruelle | Rigorous Results in Statistical Mechanics |
| R. L. Ingraham | Consequences of a Fundamental Length in Very High Energy Scattering |
| Enrico Beltrametti | Group Theoretical Properties of Complex Angular Momenta |
| Jean Nuyts | Remarks on the $ \vec{\Delta} = \frac{1}{2}$ Rule in Weak Interactions |
| W. E. Parry | Some Aspects of the Liquid Helium Problem |
| H. Y. Chiu | Selected Topics in Modern Theoretical Physics |
| J. G. Valatin | Theory of Superfluids |
| Tullio Regge | Recent Progress in Potential Scattering Theories |
| William A. Fowler and Joseph L. Vogl | Nuclear and Neutrino Processes in Stars and Supernovae |
| Peter G. O. Freund | The Method of Complex Angular Momenta in Relativistic Quantum Theory |

VOLUME VI, 530 PAGES, \$7.00

Order From: UNIVERSITY OF COLORADO PRESS
REGENT HALL, ROOM 206
BOULDER, COLORADO 80304



**MAKE
MOLECULES
ON A
UNIMAT?**



Even though Unimat can turn, drill, mill and saw parts so small you need tweezers to handle them, making a molecule, actual size, is quite impossible. But molecule models are made in prototype by Science Teaching Aids Co., of Pell Lake, Wisconsin, who are famous for their DNA "working molecule model".

Paul Dziulak, biologist (in photo) says, "Our work is very unusual. Our biological cell models are made of metals, hard plastics, epoxies. Nature seldom makes anything in true round, square or flat shapes. That's why we use Unimat in our design shop . . . because of its ability to tackle so many unusual jobs in machining, cutting, polishing impossible shapes."

Isn't it time to put Unimat to work for you too?

A special bulletin describing the Science Teaching Aids Co. shop, unusual Unimat applications and latest tech literature will be sent free on request.

Write today to

AMERICAN EDELSTAAL INC. (or)

Dept. R-L4, 350 Broadway
New York 10013

CANADIAN EDELSTAAL

47 Granger Ave.
Scarborough,
Ontario, Canada

SOLID STATE PHYSICS

Potential Barriers in Semiconductors. By B. R. Gossick. 153 pp. Academic, New York, 1964. Cloth \$5.50; paper \$2.45.

Atomic Migration in Crystals. By L. A. Girifalco. 162 pp. Blaisdell, New York, 1964. \$3.75.

Electronic Processes in Ionic Crystals. By N. F. Mott and R. W. Gurney. 275 pp. (Reprint of 1948 ed.) Dover, New York, 1964. Paper \$2.00.

Analytical Chemistry, Volume 4, Part I. Carl E. Crouthamel, ed. 72 pp. (Pergamon, Oxford) Macmillan, New York, 1964. Paper \$4.25.

Introduction to Semiconductor Physics. By R. B. Adler, A. C. Smith, and R. L. Longini. 247 pp. Wiley, New York, 1964. Cloth \$4.50; paper \$2.65.

SPACE SCIENCES & AERODYNAMICS

Jet Propulsion for Aerospace Applications (2nd ed.) By Walter J. Hesse and Nicholas V. S. Mumford, Jr. 617 pp. Pitman, New York, 1964. \$15.00.

Space Physics. By Sir Harrie Massey. 237 pp. Cambridge University Press, London, 1964. Cloth \$6.50; paper \$2.95.

Man and Space. By Arthur C. Clarke. 200 pp. Time, Inc., New York, 1964. \$3.95.

TEXTBOOKS

Physics Laboratory Manual. (2nd ed.) By Edward B. Nelson. 132 pp. Wm. C. Brown, Dubuque, Iowa, 1964. Paper \$4.50.

Elementary Theory of Electric and Magnetic Fields. By Warren B. Cheston. 393 pp. Wiley, New York, 1964. \$9.75.

A Laboratory Course in Physics, Book 1. By D. L. Livesey, G. H. Cannon, and T. Ryniak. 176 pp. The Copp Clark Publishing Co., Vancouver, Canada, 1964. \$2.75.

A Collection of Problems on Mathematical Physics. By B. M. Budak, A. A. Samarskii, and A. N. Tikhonov. Transl. by A. R. M. Robson. Transl. Edited by D. M. Brink. 770 pp. (Pergamon, Oxford) Macmillan, New York, 1964. \$11.50.

Mathematical Methods in Physics. By J. S. R. Chisholm and Rosa M. Morris. 719 pp. North-Holland, Amsterdam, 1964. \$10.00.

THERMAL PHENOMENA

Selected Papers on the Theory of Thermal Convection. With Special Application to the Earth's Planetary Atmosphere. Barry Saltzman, ed. 461 pp. Dover, New York, 1962. Paper \$3.00.

The Laws and Applications of Thermodynamics. By A. D. Buckingham. 208 pp. (Pergamon, Oxford) Macmillan, New York, 1964. Paper \$3.75.

X-RAYS

The Precession Method in X-Ray Crystallography. By Martin J. Buerger. 276 pp. Wiley, New York, 1964. \$13.50.

A first-class Monochromator for under \$900.⁰⁰



Here is more monochromator than ever before available at twice the price. Advanced Jarrell-Ash optics is one reason. Another is exceptional versatility. Features like two gratings in place which may be interchanged simply by turning an external knob make this new instrument the standard monochromator for general use in every physics, chemistry and biology laboratory. Wide wavelength range from ultraviolet to infrared. Write for complete specifications.

MODEL 400 JARRELL-ASH 0.25 METER EBERT MONOCHROMATOR

APERTURE
RATIO f/4.3

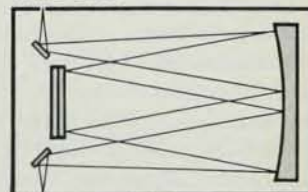
RESOLUTION . . . As good as 1A with
10 micron slits

SLITS Focusable for opti-
mum resolution

READOUT . . . Digital counter

WEIGHT Approx. 12 pounds

OPTICAL LAYOUT

Jarrell
—Ash

ANALYTICAL INSTRUMENTATION

JARRELL-ASH COMPANY • 540 Lincoln Street, Waltham, Mass. 02154