

part of the book that anyone in search of examples or counterexamples will be rewarded. It can also be recommended to professors in search of dissertation problems, for the physical significance of much of this work remains yet to be tapped. In fairness, it should be pointed out that the original edition contained calculational errors, but I hope these have now been eliminated.

Other topics discussed are conformal, geodesic and projective mappings of Riemannian spaces, the Cauchy problem for the Einstein field equations and special types of gravitational fields. In addition, there is an interesting bibliography of over 500 items. It may safely be predicted that this book will be an indispensable part of any relativity library for many years to come.

WOLFGANG RINDLER
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Magnetodynamique Des Fluides

By Henri Cabannes

(2nd edition) 289 pp. Centre de Documentation Universitaire, Paris, 1969.

[Translated as *Theoretical Magnetofluid-dynamics* by M. Holt. Academic, New York, 1970. \$12.50]

In 1832 shortly after his epoch-making discovery of electromagnetic induction, Michael Faraday conceived the idea that an electrically conducting fluid flowing across the lines of force of the earth's magnetic field should have an electric current induced in it. He tried out his idea in the River Thames at London, though without success. Nevertheless, this was the origin of the subject now known as "fluid magnetodynamics" or more familiarly, in the case of flowing liquids, as "magnetohydrodynamics." This discipline has recently achieved much attention both from the standpoint of its engineering possibilities as well as its basic interest for astrophysics and for the flow of highly ionized fluids through magnetic fields.

In the volume under review the well known professor in the Faculty of Sciences in Paris (Sorbonne) has provided a thorough introduction to the theoretical basis of fluid magnetodynamics. He develops the general equations for a conducting fluid moving through a magnetic field and discusses the conditions under which they are exactly soluble. The author considers not only the case of the propagation of small disturbances through such a fluid but also shock waves. Diffraction around obstacles and propagation through tubes are also considered.

The treatment is theoretical throughout, and there is no discussion of ex-

perimental results. The presentation is clear, and the book should be useful to all who are interested in the basic principles of fluid magnetodynamics and have the appropriate mathematical competence in dealing with the partial differential equations of fluid dynamics and electromagnetism.

R. BRUCE LINDSAY
Hazard Professor of Physics
Brown University

Electrons de Conduction et Surface de Fermi des Métaux

By Cl. Boulesteix, M. Bruneaux

124 pp. Dunod, Paris, 1969. 24 F

The purpose of this book is to introduce the reader to the Fermi surface, the experimental methods for determining it and its relation to magnetic properties of solids.

The first part is a review of the electron theory of solids. It is extremely compressed and, in particular, the description of the Fermi surface is so brief that it leaves one with many names and little understanding.

The second part discusses transport problems and the Fermi surface, but again the presentation is far too condensed.

The last and longest part is concerned with the relation of the Fermi surface to magnetic properties. There are very brief descriptions of cyclotron resonance, galvanomagnetic effects, deHaas-Van Alphen effect, deHaas-Shubnikov effect and others. Again I found many of these described much too briefly.

I feel that the monograph would have been much more effective if it had assumed previous reading of one of the standard texts and had devoted its limited space to the discussion of magnetic effects, which are the center of interest at the present time.

MORTON HAMERMESH
University of Minnesota

Ultrasonic Methods in Solid State Physics

By Rohn Truell, Charles Elbaum,
Bruce B. Chick

463 pp. Academic, New York, 1969.
\$19.75

This book will be of great value to experimentalists beginning research work in this field. It starts off with a rather elementary classical treatment of wave propagation in solids and then presents an excellent description of the experimental methods and techniques involved in pulse-echo measurements in the megahertz range. The experi-

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Stehle

Physics: The Behavior of Particles

Philip Stehle, University of Pittsburgh. February, 1971. Tentative: 416 pp.; \$11.50. A non-calculus introductory physics text for students of biology, pre-medicine, architecture, and the liberal arts. It approaches classical and modern physics through the study of the behavior of particles. The first half consists of the study of individual particles starting with directly observable ones and going on to electrons, atoms, nuclear particles, and finally fundamental particles. The discussion is based on Newton's Laws of Motion, modified to include relativistic mechanics where needed, and on detailed appeal to experimental observation. The second half of the book includes the study of systems of many particles, especially molecules in gases and electrons in solid materials. Here quantum ideas are introduced and play an important role. Again experimental observation is emphasized.

Moriber • Hudes

Laboratory Studies in the Physical Sciences

George Moriber and Isidore Hudes, Brooklyn College. February, 1971. Tentative: 352 pp.; \$4.95. Paper. A new, self-contained laboratory manual for a one-year introductory physical science survey course for nonscience students. Covers experiments in physics, chemistry, astronomy, and geology. Provides detailed introductions to each experiment, pertinent historical background material, tear-out data recording sheets, and many review exercises. Many experiments contain alternative procedures and appendixes with more advanced information.

Cooper

An Introduction to the Meaning and Structure of Physics

Leon N Cooper, Brown University. 1968. 746 pp.; \$13.95. This tightly structured text for which calculus is not a prerequisite examines in a rigorous but not overly technical manner all the classical topics—mechanics, heat, light, electricity, magnetism—and then studies modern physics. This approach integrates the fundamental ideas of physics within their historical setting; generalizations and abstractions of more advanced concepts follow. The pace varies—some sections are rigorous and quantitative, others are more expository.

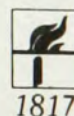
AN INTRODUCTION TO THE MEANING AND STRUCTURE OF PHYSICS, Short Edition

1970. 535 pp.; \$11.95. An abridged and slightly revised version of the original book, the SHORT EDITION covers nearly all the same topics but excludes some of the more technical illustrations and simplifies more difficult parts of the exposition. 80 new problems; 8 additional color plates.

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mental material, which also includes many details of data analysis and equipment design, is presented with great clarity by the authors, who are all experts in ultrasonics.

The second half is devoted to the causes of ultrasonic attenuation in solids. Dislocation damping is the subject treated in greatest detail; the "string" of Granato and Lücke is thoroughly reviewed, and the "kink" model is also discussed in connection with Bordoni peaks. The interaction of stress waves with conduction electrons in metals is well described, and several applications to Fermi surface studies are given. The interaction of ultrasonic waves with thermal lattice vibrations (phonon-phonon interaction) is presented in terms of several recent versions of Akhieser's statistical model as well as a quantum-mechanical approach. Other topics include scattering, thermoelastic, magnetoelastic and acoustoelastic effects, interaction of stress waves with nuclear and electron spins, and a treatment of stress waves in piezoelectric semiconductors.

The book is dedicated to the late Rohn Truell and stands as a tribute to his pioneering work in ultrasonics.

CARL GARLAND
Professor of Chemistry
Massachusetts Institute of Technology

new books

CONFERENCE PROCEEDINGS

Clustering Phenomena in Nuclei. (Conf. proc. International Conference on Clustering Phenomena in Nuclei, Bochum, Austria, 21-24 July, 1969). 354 pp. International Atomic Energy Agency, Vienna, 1969.

A Critical Review of Thermodynamics. (International Symposium on Thermodynamics, University of Pittsburgh, April 7-8, 1969.) E. B. Stuart, B. Gal-Or, A. J. Brainard, eds. 531 pp. Mono Book Corp., Baltimore, 1970. \$25.00

Eighth International Congress on Glass, Vols. I and II. (Conf. proc. 8th International Congress, London, 1-6 July, 1968.) 271 pp. Society of Glass Technology, England, 1969.

Global Effects of Environmental Pollution. (Symposium organized by the American Association for the Advancement of Science, Dallas, Texas, Dec. 1968.) S. F. Singer, ed. 218 pp. Springer-Verlag, New York 1970. \$12.00

Inelastic Behavior of Solids. (Batelle Institute Materials Science Colloquia, Columbus, Ohio, 15-19 Sept., 1969.) M. F. Kanninen, W. F. Adler, A. R. Rosenfield, R. I. Jaffee, eds. 743 pp. McGraw-Hill, New York, 1970. \$44.50

Polymers in Space Research. (Symposium on Polymers in Space Research, Pasadena, Calif., 15-17 July, 1968.) C. L. Segal, M. Shen, F. N. Kelley, eds. 462 pp. Marcel

Dekker, New York, 1970. \$24.50

Proceedings of the International Conference on Organic Superconductors. (Conference on Organic Superconductors, Honolulu, Hawaii, 5-9 Sept., 1969.) W. A. Little, ed. 224 pp. Wiley, New York, 1970. \$11.50

Proceedings of the Symposium on Nuclear Reaction Mechanisms and Polarization Phenomena (Quebec, Canada, Aug. 1970.) B. Cujec, Q. Ho Kim, and R. J. Slobodrian, eds. 503 pp. Les Presses De L'Université Laval, Quebec, 1970. \$15.00

Symmetries and Quark Models. (Proceedings of International Conference, Wayne State University, Detroit, Mich., 18-20 June 1969.) By R. Chand. 406 pp. Gordon and Breach, New York, 1970. Reference \$27.50; professional, \$14.50.

ATOMS, MOLECULES, CHEMICAL PHYSICS

Flames: Their Structure, Radiation and Temperature. By A. G. Gaydon and H. C. Wolfhard. 401 pp. Barnes and Noble (Chapman and Hall), New York, 1970. \$19.00

Orbitals and Symmetry. By D.S. Urch. 256 pp. Penguin, Baltimore, 1970. \$4.95

ACOUSTICS

Physical Acoustics, Vol. 7: Principles and Methods. W. P. Mason, R. N. Thurston, eds. 308 pp. Academic, New York, 1970. \$19.50

ELECTRICITY AND MAGNETISM

La Physique des Transitions. By N. Boccaro. 126 pp. Presses Universitaires de France, Saint-Germain, Paris, 1970.

La Thermoélectricité. By A. Linder. 123 pp. Presses Universitaires de France, Saint-Germain, Paris, 1970.

SOLIDS

La Physique du Metal. By P. Peguin. 126 pp. Presses Universitaires de France, Saint-Germain, Paris, 1970.

Semiconductors and Semimetals, Vol. 5: Infrared Detectors. R. K. Willardsen, A. C. Beer, eds. 551 pp. Academic, New York, 1970. \$26.00

The Solid State Maser. J. W. Orton, D. H. Paxman, J. C. Walling, eds. 283 pp. Pergamon, New York, 1970. Hard, \$7.00; paper, \$5.50

Structure and Properties of Inorganic Solids. By Francis S. Galasso. 297 pp. Pergamon, New York, 1970. \$13.50

ASTRONOMY, SPACE, GEOPHYSICS

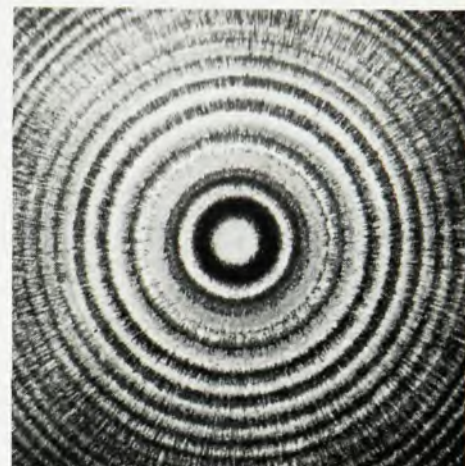
Debate about the Earth. By H. Takeuchi, S. Uyeda, H. Kanamori. (Trans. Keiko Kanamori) (Revised edition) 281 pp. Freeman, San Francisco, 1970. Cloth, \$5.25; paper \$2.80

Dynamics of Geomagnetically Trapped Radiation. By J. G. Roederer. 166 pp. Springer-Verlag, New York, 1970. \$9.90

Physics and Chemistry in Space, Vol. I: Geomagnetic Micropulsations. J. G. Roederer, ed. 179 pp. Springer-Verlag,

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