

of the picture that finally emerges.

This book might be useful to a young particle physicist familiar with the modern view but curious about how it came to be. It might also serve as a *Baedeker* for a historian hoping to move into the field. It is not suitable as an introductory textbook in particle physics.

Above all, Dodd fails to convey the wonder and stark simplicity of this new world view: the one-to-one correspondence between fields and structureless particles that are devoid of any qualities other than their couplings to fields. This is the splendor worthy of the attention of our peers in other disciplines, and it is one they are fully capable of appreciating. It is easy to imagine that Democritus himself would have marveled at the beauty of it.

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book notes

Chaos

Hao Bai-Lin

586 pp. World Scientific, Singapore (US dist. Taylor and Francis, Philadelphia), 1984. \$56.00 hardcover, \$26.00 paper

Although the study of chaos is a relatively new field of physics—textbooks started to appear only recently—the field is already represented by a large number of papers. The editor of this collection of papers and author of its 75-page introduction to the study of chaos points out that “it is absolutely impossible to include all important publications on chaos in a single volume.”

The book is divided into three parts. Part One consists of the 10-chapter introduction; each chapter ends with a list of references, some of which are reprinted in this volume. Part Two contains 41 papers by theorists and experimenters, grouped according to topic. Part Three contains two detailed bibliographies, a listing of books and conference proceedings, and a listing of papers, including reviews.

Hao identifies in the introduction some of the papers that were important in the development of the field: the 1963 paper by Edward N. Lorenz in which he discussed the simplified mathematical model of thermal convection that now is named after him; a paper by David Ruelle and Floris Takens published in 1971, in which they coined the term “strange attractors”; and Robert May’s comprehensive review of the field, published in 1976 in *Nature* and identified by Hao as “a good starting point for a first acquaintance with chaos.” The volume includes a paper by Lev Landau, “On the problem of turbulence,” originally published in Russian in 1944 and an excerpt of “A

mathematical example displaying features of turbulence,” published by Eberhard Hopf in 1948, showing that the field is not that young after all.

—ALEXANDER HELLEMANS

new books

Particles, Nuclei and High-Energy Physics

Clustering Aspects of Nuclear Structure. Proc. Int. Conf., Chester, England, July 1984. J. S. Lilley, M. A. Nagarajan, eds. 420 pp. Reidel, Boston, 1985. \$54.00

Elementary Particles. Second edition. I. S. Hughes. 349 pp. Cambridge U.P., 1985. \$49.50. Text

Fundamental Problems in Heavy-Ion Collisions. Proc. 5th Adriatic Int. Conf. Nuclear Physics, Hvar, Yugoslavia, September 1984. N. Cindro, W. Greiner, R. Caplar, eds. 588 pp. World Scientific, Singapore (US dist. Taylor and Francis, Philadelphia), 1985. \$72.00

Interacting Boson-Boson and Boson-Fermion Systems. Proc. Wksp., Gull Lake, Michigan, May 1984. O. Scholten, ed. 400 pp. World Scientific, Singapore (US dist. Taylor and Francis, Philadelphia), 1985. \$51.00

Nucleosynthesis: Challenges and New Developments. W. D. Arnett, J. W. Truran, eds. 306 pp. Univ. Chicago P., Chicago, 1985. \$18.00. *Compendium*

The Quark Structure of Matter. Proc. Sum. Sch., Yukon, Canada, August 1984. N. Isgur, G. Karl, P. J. O'Donnell, eds. 350 pp. World Scientific, Singapore (US dist. Taylor and Francis, Philadelphia), 1985. \$43.00

Solid-State Physics and Electronics

Polarized Electrons at Surfaces. *Springer Tracts in Modern Physics* 106. J. Kirschner. 158 pp. Springer-Verlag, New York, 1985. \$24.00. *Monograph*

Applications of Plasma Processes to VLSI Technology. T. Sugano, ed. 394 pp. Wiley, New York, 1985. \$44.95. *Compendium*

Electronic Excitations in Condensed Rare Gases. *Springer Tracts in Modern Physics* 107. N. Schwentner, E.-E. Koch, J. Jortner. 239 pp. Springer-Verlag, New York, 1985. \$34.00. *Monograph*

Electronic Properties of Materials: An Introduction for Engineers. R. E. Hummel. 319 pp. Springer-Verlag, New York, 1985. \$34.50. *Text*

Photoelectrochemical Solar Cells, Vol. 5. S. Chandra. 270 pp. Gordon and Breach, New York, 1985. \$59.00. *Monograph*

Semiconductor Physics: An Introduction. *Springer Series in Solid-State Sciences* 40. K. Seeger. 476 pp. Springer-Verlag, New York, 1985. \$29.00. *Text*

Spin Fluctuations in Itinerant Electron Magnetism. *Springer Series in Solid-State Sciences* 56. T. Moriya. 236 pp. Springer-Verlag, New York, 1985. \$35.00. *Monograph*

States of Matter. D. L. Goodstein. 500 pp. Dover, New York, 1985. \$9.95. *Reprint*

Physics and Chemistry of III-V Compound Semiconductor Interfaces. C. W. Wilmsen, ed. 465 pp. Plenum, New York, 1985. \$69.50. *Compendium*

The Technology and Physics of Molecular Beam Epitaxy. E. H. C. Parker, ed. 686 pp. Plenum, New York, 1985. \$89.50. *Compendium*

Thirteenth International Conference on Defects in Semiconductors. Proc. Int. Conf., Coronado, California, August 1984. L. C. Kimerling, J. M. Parsey Jr, eds. 1252 pp. American Institute of Mining, Metallurgical, and Petroleum Engineers, New York, 1985. \$65.00

Localization and Metal-Insulator Transitions. H. Fritzsche, D. Adler, eds. 533 pp. Plenum, New York, 1985. \$75.00. *Festschrift in honor of Nevill Mott*

Physics of Disordered Materials. D. Adler, H. Fritzsche, S. R. Ovshinsky, eds. 850 pp. Plenum, New York, 1985. \$120.00. *Festschrift in honor of Nevill Mott*

Tetrahedrally-Bonded Amorphous Semiconductors. D. Adler, H. Fritzsche, eds. 564 pp. Plenum, New York, 1985. \$79.50. *Festschrift in honor of Nevill Mott*

Acoustics

Music Speech High-Fidelity. Second edition. W. J. Strong, G. R. Plitnik. 377 pp. Soundprint, Provo, Utah, 1983. \$20.00. *Text*

The Noise Handbook. W. Tempest, ed. 407 pp. Academic, New York, 1985. \$68.00. *Compendium*

History, Philosophy, Society & Government

From Maxwell to Microphysics: Aspects of Electromagnetic Theory in the Last Quarter of the Nineteenth Century. J. Z. Buchwald. 356 pp. Univ. Chicago P., 1985. \$70.00

A History of Mathematics. Fourth edition. F. Cajori. 524 pp. Chelsea, New York, 1985. \$22.50

Arms Control and the Arms Race. *Readings from Scientific American.* B. M. Russett, F. Chernoff, eds. 229 pp. W. H. Freeman, New York, 1985. \$14.95

Cultural Imperialism and Exact Sciences: German Expansion Overseas 1900-1930. *Studies in History and Culture* 1. L. Pyenson. 342 pp. Peter Lang, New York, 1985. \$40.00

Fusion: Science, Politics, and the Invention of a New Energy Source. J. L. Bromberg. 344 pp. MIT Press, Cambridge, Mass., 1985. \$9.95 paper

History of Physics. Readings from PHYSICS TODAY 2. S. R. Weart, M. Phillips, eds. 373 pp. AIP, New York, 1985. \$25.00

The Beginnings of Electron Microscopy. P. W. Hawkes, ed. 633 pp. Academic, New York, 1985. \$88.00. *Compendium*

The Joy of Science: Excellence and Its Rewards. C. J. Sindermann. Plenum, New York, 1985. \$16.95. *Sociological study*

Theory and Mathematical Physics

Calculus of Variations with Applications. G. M. Ewing. 343 pp. Dover, New York, 1985. \$8.50. *Reprint*

Contact Mechanics. K. L. Johnson. 452 pp. Cambridge U.P., New York, 1985. \$89.50. *Text*

Electromagnetic Waves. E. R. Dobbs. 145 pp. Routledge & Kegan Paul, Boston, 1985. \$9.95. *Undergraduate text*

Formelsammlung zur Numerischen Mathematik mit BASIC-Programmen. G. Engel-Müllges, F. Reutter. 431 pp. Bibliographisches Institut, Mannheim, W. Germany, 1985. Price not stated

Geometry of Quantum Theory. Second edition. V. S. Varadarajan. 412 pp. Springer-Verlag, New York, 1985. \$54.00. *Text*

Problems in Perturbation. A. H. Nayfeh. 556 pp. Wiley, New York, 1985. \$39.95. *Text*

Theory of Functions of a Complex Variable. A. I. Markushevich. 446 pp. + 325 pp. + 367 pp. Chelsea, New York, 1985. \$35.00. *Reprint, three volumes in one*

Unbounded Linear Operators: Theory and Applications. S. Goldberg. 199 pp. Dover, New York, 1985. \$6.00. *Reprint*

Miscellaneous

Complex Systems: Operational Approaches in Neurobiology, Physics, and Computers. Proc. Int. Symp., Schloss Elmau, Bavaria, May 1985. H. Haken, ed. 366 pp. Springer-Verlag, New York, 1985. \$39.00

Interstellar Migration and the Human Experience. B. R. Finney, E. M. Jones, eds. 354 pp. Univ. California P., Berkeley, 1985. \$19.95. *Compendium*

Transmission Lines, Waveguides, and Smith Charts. R. L. Liboff, G. C. Dalman. 269 pp. Macmillan, New York, 1985. \$37.95. *Text*

Corrections

The Enigma of Probability and Physics. L. Mayants. 373 pp. Reidel, Boston, 1984. \$69.00. *Advanced text*

Hydrodynamic Instabilities and the Transition to Turbulence. Second edition. *Topics in Applied Physics 45.* H. L. Swinney, J. P. Gollub, eds. 306 pp. Springer-Verlag, New York, 1985. \$19.50. *Compendium*

Nonlinear Oscillations, Dynamical Systems, and Bifurcations of Vector Fields. J. Gluckheimer, P. Holmes. 453 pp. Springer-Verlag, New York, 1983. \$34.00. *Reviewed November, page 102*

Physics of Gravitating Systems. Vol. I: Equilibrium and Stability. Vol. II: Nonlinear Collective Processes: Nonlinear Waves, Solitons, Collisionless Shocks, Turbulence. Astrophysical Applications. A. M. Fridman, V. L. Polyachenko. Springer-Verlag, New York, 1984. Volume I, 480 pp., \$84.00; Volume II, 362 pp., \$60.00. *Reviewed November, page 105* □

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