

and 247 references discussing everything from time-of-flight techniques for neutrons and charged particles to the problems of uniformity, channeling and secondary nuclear reactions in passing detectors.

This book is ideally suited for students just entering into nuclear physics and for anyone already in the field who has any interest in learning about experimental techniques other than those in his own familiar niche. It should be in every laboratory's library and should be required reading for all experimental nuclear-physics graduate students.

PETER PARKER
Yale University
New Haven, Connecticut

Developments in the Theory of Turbulence

D. C. Leslie

368 pp. Oxford U. P., New York, 1973.
\$38.50

Turbulence seems to be the ubiquitous block to further progress in solving fluid-flow problems. Even the simplest problems involving homogeneous, isotropic turbulence have, until recently, defied solution. But now limited successes have been achieved in the work of Robert Kraichnan and his followers. Although Kraichnan's goal of developing a completely deductive theory of turbulence has not yet been reached, there have come out of the search a number of partly phenomenological stochastic models of turbulence that predict observed and numerically simulated turbulence statistics to within about 20%.

In this book, dedicated to Kraichnan, David Leslie has provided a coherent description of these recent developments. Himself an important contributor to the field, he leads the reader skillfully through the complicated kinematic manipulations required by the subject to the essential dynamical difficulties at the core. And along the way he provides cautionary comment to keep the reader from confusing complexity with truth.

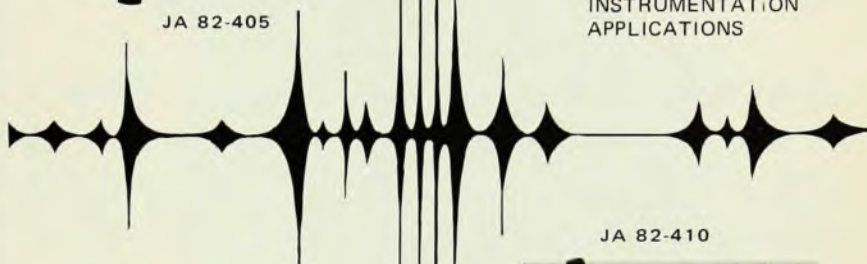
Although the author attempts in the final chapters to relate these theoretical developments to the solution of real flow problems, the book will probably be of more value to those interested in methods of approximation for solutions of the Liouville equation for statistical hydrodynamics than to those wishing to compute turbulent heat transfer. Here, for example, the reader will find lucid discussions of the breakdown of the quasi-normal approximation, the construction of the Eulerian Direct Interaction approximation, the need for La-

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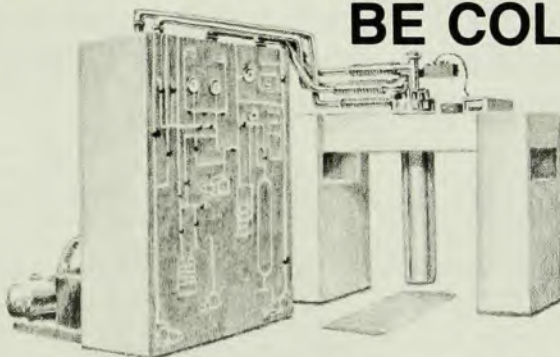
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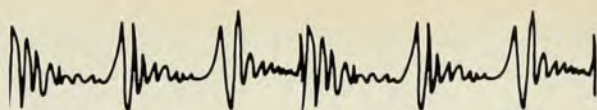
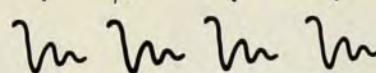
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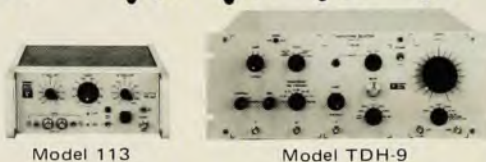
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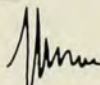
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grangian formulations, and the Langevin-type models of which the test-field model is the best example.

Inevitably, in a time of rapid change, developments have already occurred beyond those included in the book. Comparisons with direct numerical integrations of the Navier-Stokes equation continue to justify Leslie's optimistic appraisal of the test-field model. And I believe that it is becoming increasingly unlikely that a more complete turbulence theory will ever be able to compete with the simpler stochastic models on the basis of practical computability. Specifically I would caution the reader against excessive concern with the intricacies of the Lagrangian History Direct Interaction approximation, while I highly recommend the book as a whole.

CECIL E. LEITH

*National Center for Atmospheric Research
Boulder, Colorado*

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Theory of Interaction of Elementary Particles at High Energies. (Proc. of the P. N. Lebedev Physics Inst., Vol. 57). D. V. Skobel'syn, ed. 258 pp. Plenum, New York, 1974. \$37.50.

Atoms and Molecules

Angular Momentum Theory for Diatomic Molecules. B. R. Judd. 238 pp. Academic, New York, 1975. \$22.50

Electronic and Ionic Impact Phenomena, Vol. 5: Slow Positron and Muon Collision and Notes on Recent Advances. H. S. W. Massey, E. H. S. Burhop, H. B. Gilbody. 567 pp. Oxford U. P., New York, 1975. \$52.50

Chemical Physics

Low Energy Electrons and Surface Chemistry. G. Ertl, J. Küppers. 251 pp. Verlag Chemie, Weinheim, West Germany, 1974. DM 98.00

Physical Properties of Inorganic Compounds, SI Units. A. L. Horvath. 466 pp. Crane, Russak, New York, 1975. \$64.00

Principles and Problems in Physical Chemistry for Biochemists. N. C. Price, R. A. Dwek. 186 pp. Oxford U. P., New York, 1975. \$17.75 hardcover, \$7.75 paperback

Vacuum Ultraviolet Radiation Physics. (Proc. of the 4th Int. Conf., Hamburg, West Germany, 22-26 July 1974). E. E. Koch, R. Haensel, C. Kunz, eds. Pergamon, New York, 1974. \$60.00

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