

New Books from North-Holland

The Practitioner's Shell Model

By **G.F. Bertsch**, Michigan State University

CONTENTS: Many-Body Theory and the Shell Model. Harmonic Oscillator Wavefunctions. Angular Momentum. The Nuclear Force. Two-Body Correlations: Deformations and Aligned coupling. Core Polarization. Nuclear Reactions. Appendices: LS-jj Recoupling Coefficients. Problem Hints and Solutions. References. Index. 1972, approx. 200 pp., \$11.95

Mathematical Theory of Transport Processes in Gases

By **J.H. Ferziger**, Stanford University, California, and **H.G. Kaper**, Argonne National Laboratory, Illinois

CONTENTS: Introduction. Properties of a Gas. Boltzmann's Equation. Fundamental Properties of Boltzmann's Equation. The Non-Uniform State of a Simple Gas. The Non-Uniform State of a Gas Mixture. The Transport Coefficients. Intermolecular Forces and Atomic Collisions. Calculation of Transport Properties for Specific Models. Comparison of Theory and Experiment—Noble Gases and their Mixtures. Polyatomic Gases. Dense Gases—Enskog's Theory. Dense Gases—General Theory. Ionized Gases. Dynamics of Rarefied Gases. Appendix A: Vectors and Tensors. B: Reduction of Bracket Integrals. C: Tables of Transport Integrals. D: Evaluation of Certain Integrals, in Enskog's Theory of Dense Gases. E: Evaluation of the Flux Vectors in Dense Gases. References.

1972, approx. 570 pp., \$39.50

Unified Theory of Nuclear Models and Forces

By **G.E. Brown**, Professor of Physics, Nordita, Copenhagen, and State University of New York, Stony Brook

CONTENTS: Occupation Number Representation. Self-Consistent Fields. The Shell Model. Single-Particle Excitations and Vibrations. Fancier Methods. Rotations. Pairing in Nuclei. Quasiparticles. The Optical Model. Theory of Nuclear Matter. Brueckner Theory. Further Developments in the Theory of Nuclear Matter. Effective Forces in Nuclei. Isobaric Analogue States. Bibliography. Index.

1972, 3rd rev. ed., 328 pp., \$14.75

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on a local causal order, a topology, a pseudometric, a coordinatization, an affine connection and a material distribution, each of which may in special cases be determined by the preceding. The work is too rich in geometrical ideas to summarize here. It is mathematical in content (Definition, Theorem, Proof) with frequent appeal to physics for motivation, and overlaps Busemann's book, which appeared a little earlier. Pimenov deals with Newtonian kinds of kinematic space, in which the causal relation tells little about the geometry, as well as Einsteinian, where the causal relation tells much about the geometry. This leads him to the more general conception of semi-Riemannian geometry, where the metric need not fully determine the affine connection and signals may propagate instantaneously in some directions, a degenerate limit of Riemannian geometry. One of the most interesting models of this kind he calls an "electrodynamical space." It is a plausible five-dimensional model of electromagnetism, with significant advantages over the Kaluza kind of model. Other internal degrees of freedom of current interest besides electric could also be modeled interestingly in semi-Riemannian spaces.

His frequent bibliographical discussions show Pimenov knows the work of other relativists well, but my informal survey suggests that the reverse is not true; and I find ideas I published as virgin were his long before. This is not entirely surprising because he has been confined for much of his career, and is in prison now; a consequence, it seems, of unofficial publication, and the cause of a deplorable lack of contact with the scientific community. But the resulting deprivation is not Pimenov's alone.

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Worked Examples in X-Ray Spectrometry

By **R. H. Jenkins, J. L. DeVries**

127 pp. Springer-Verlag, N. Y.
1970. 5.80

This little volume is clearly designed to accompany and supplement the authors' earlier work on x-ray spectrometry and their forthcoming work on x-ray diffractometry. Worked examples, carefully selected and clearly explained, can obviously be of great help to beginners and to those to whom suitable academic training is not readily available. Both authors have had extensive experience in teaching students in various schools and seminars organized by N. V. Philips Co. of Eindhoven,

Holland. Problems in the book have been selected with care and have been organized in a reasonable fashion. There are five sections dealing with spectra, instrumentation, counting statistics, quantitative analysis and "miscellaneous." A relatively small number of problems are of a general type; others deal with x-ray spectrometry and diffractometry in approximately equal numbers. The problems are graded in order of increasing difficulty. So far, so good.

Unfortunately, the book is marred by an intolerable number of typographical and other errors. A random check of some 20 problems revealed serious errors in almost every one. Also, the figures accompanying the text are often unclear. Explanatory texts directly beneath each figure would be of help to the reader, as would concise and meaningful titles for the many Tables.

In its present form this work cannot be recommended. It could, however, be recommended and serve a useful purpose if adequate care is taken in the preparation of a second edition.

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Theoretical Physics: An Advanced Text, Vol. 1: Theory of the Electromagnetic Field Theory of Relativity

By **B. G. Levich**

395 pp. Wiley, New York,
1971. \$15.50

Here we see the first volume in a series of four books on theoretical physics written for undergraduates and beginning graduate students in physics who are not able to cope with texts of the Landau and Lifshitz calibre. The author, Benjamin G. Levich, is associated with the Institute of Electrochemistry of the Soviet Academy of Sciences, and these books, published in Russia in 1962, have evidently found wide appeal as texts. Volume 1 of Levich's course deals with electrodynamics of classical systems, and might be compared with the third volume of the famous Sommerfeld lecture series. As might be expected, there are few surprises in the choice of material and exposition in Levich's text.

One good feature of this book is its treatment of radiation theory, which the student will find quite detailed. As an example, a nice derivation of the quadrupole radiation formula, $1 = (\ddot{D}_{\alpha\beta})^2 / 180c^5$, is given on page 133. Another good chapter is that dealing with the motion of particles in electric and magnetic fields, drift of particles in crossed **E** and **H** fields, and magnetic