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TOPICS IN ASTROPHYSICS
AND SPACE SCIENCE

THE THEORY OF STELLAR SPECTRA

By Charles R. Cowley, *University of Michigan*

1970 Cloth, \$19.50/Prepaid, \$15.60
272pp. Paper, \$ 8.50/Prepaid, \$ 6.80

This book describes the theory of stellar spectra as it is currently used in the actual analysis of stellar spectrograms. Considerable emphasis has been placed on the physical background of the ideas employed. Separate chapters discuss the theory of radiation statistical mechanics, and the quantum mechanical theory of line broadening. The discussion of the calculation of spectra features and abundances is oriented to the modern techniques which employ high-speed computers.

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THE BOOK OF MARS

By Samuel Glasstone, *NASA*

1970 *Professional, \$ 8.50/Prepaid, \$ 6.80
322pp. Reference, \$17.50/Prepaid, \$14.00

"An engaging, thorough and exceptionally clear discourse . . . the book begins with an excellent historical introduction to Mars . . . followed by a quite well done descriptive section . . . proceeds to discuss the physical environment, the Martian atmosphere, surface, clouds and haze . . . discusses modern ideas about the possibility of life on Mars." —*Science Magazine*

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meter kelvin. The proposed reciprocal unit, for thermal resistivity would be symbolized by "rf." It is a pleasing commentary on physicists' occasional rationality that most responses object to the new unit and urge the explicit use of specific units, preferably SI (Système Internationale), in data presentation.

This volume contains a good deal of new experimental data and compilations (especially on thermal diffusivity of elements). It will be of interim value as a supplementary reference work. Its primary value probably lies in enumerating experimental techniques, in theoretical analysis schemes and in the data inconsistencies. It is apparent that much remains to be done in this field. Perhaps this in itself justifies publication of yet another conference report.

PAUL P. CRAIG

Brookhaven National Laboratory

Ondes Electromagnétiques: Relativité Trouvaux Dirigés

By Nicole Hulin-Jung

175 pp. Hermann, Paris, 1968. 36F

It is a truism in the teaching of any discipline that the only true education is self-education. This is undoubtedly the chief motivation behind the introduction of programmed instruction and the teaching machine. The aim of this paperback volume, one of a series designed to supplement volumes that introduce theoretical physics, is to stimulate self-instruction.

The author is a graduate of the École Normale Supérieure de Sèvres and is presently teaching at the University of Paris. The goal set by the book is twofold. The first is to provide a brief but thorough review of the basic elements of electromagnetic theory, particularly electromagnetic-wave propagation and special relativity. The other is to enable the student to test his grasp of the principles by reviewing some 115 problems, most of which are solved completely or partially in the text.

The problems appear to be well chosen with laudable emphasis on illustrations from contemporary atomic physics and electronics. The solutions are adequate and assure an understanding of the physics involved, and the accompanying diagrams are clear and well drawn. It is somewhat surprising, however, to see Ohm's law as-

sociated with the fundamental Maxwell's equations of the field.

The author is to be congratulated on a thorough job. His book should prove very useful to students who wish to develop a well founded grasp of electromagnetic-wave theory and special relativity.

R. BRUCE LINDSAY

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The Physical Principles Of Ultra-High Vacuum Systems and Equipment

By Norman W. Robinson

270 pp. Barnes and Noble, New York, 1968. \$12.00

"The chief aim of this book is to present the physical principles underlying the attainment and measurement of ultrahigh vacuum . . ." The author's aim is admirable, as is the title he selected. However good the aim might have been, the shot fell far short of the target.

Admittedly Norman Robinson's self-assigned task was a tall order; at present the design of ultrahigh vacuum systems and equipment is largely empirical and not based on detailed understanding of each of the many phenomena involved. Nevertheless, ignoring the implications of the title, the most severe criticism of this book would be the inadequate and incorrect explanations given for various phenomena. An example, taken from the first page of the text, should alert the reader as to what to expect; we find in a description of a Bayard-Alpert ion gauge, "The ions arriving at the collector give up their charges and the majority remain as atoms *adsorbed on the surface*" (my italics). To the contrary, ample proof may be found in the literature that the majority of the incident ions are not adsorbed, nor even ionically pumped or imbedded in the collector.

The first chapter contains, in addition to discussion of the Bayard-Alpert gauge, brief descriptions of several other gauges and calibration of gauges. The second chapter is concerned with pumping by ion burial, gettering and sorption. Considerable attention is devoted to engineering aspects, such as definition and tabulation of the "figure of merit" for various configurations of sputter-ion pumps, at the expense of discussion of, for ex-