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(planar), the author proceeds to develop the theory of reflection and transmission properties of thick and thin films for single and multiple dielectric layers, including Forsterling's and Drude's theory and Murmann's generalization of Forsterling's theory, as well as his own method. General formulas are derived for reflection and transmission coefficients for multiple thin films when both single and multiple internal reflections are assumed to take place at the interfaces and on the dielectric material which result from an incident monochromatic or white light. The author also makes a point of distinguishing a thin film from a thick one; in the former both the amplitudes and the phase differences of the light beams in the film must be considered, whereas in the latter only the intensities are taken into account. Among other topics one finds a critical discussion of the Murmann-Forsterling theory, an alternate approach to this problem by the author, and an illuminating discussion of the merits, limitations, and shortcomings of these theories in explaining the experimental observations of the reflection and transmission properties of single- and multiple-layer thin films (dielectric and metallic) on dielectrics and metals. Other topics of interest include discussions of nonhomogenous films; the achromatization problem in such optical systems as lenses, prisms, interferometers, etc.; the influence of thin films in the polarization of light at total reflection; interference filters; and application of matrix methods in studying the reflective properties of single- and multiple-layer thin films on dielectrics.

The reviewer wishes to record his pleasure in reading this book and to congratulate the publishers for their excellent typography and binding. Undoubtedly, others will enjoy reading this book, both for its clear exposition of the subject and for the valuable material and information it contains within its covers. The mathematical methods used here are within the grasp of juniors and seniors, thus making the book useful, both as a text in colleges and universities and a valuable reference book for the specialist in the laboratory or industrial establishment working on theoretical or practical problems.

Introduction to the Theory of Ionized Gases. By J. L. Delcroix. Transl. from French by Melville Clark, Jr., David J. BenDaniel, Judith M. BenDaniel. No. 8 of Tracts on Physics and Astronomy, edited by R. E. Marshak. 149 pp. Interscience Publishers, Inc., New York, 1960. Paperbound \$2.50, clothbound \$4.50. *Reviewed by Rolf Landshoff, Lockheed Missiles and Space Division.*

OUR understanding of the properties of ionized gases and of the phenomena to which these properties give rise has advanced along two major avenues using either a macroscopic or a microscopic description. Delcroix's preface points out this difference and states that his book is intended to supplement Spitzer's *Physics of Fully Ionized Gases* which uses mainly the macroscopic equations. In this spirit he puts a consid-

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PROBLEMS IN QUANTUM MECHANICS

By I. I. GOL'DMAN, V. D. KRIVCHENKOV, V. I. KOGAN, V. M. GALITSKII

Translated, edited, and arranged by D. TER HAAR

April 1961, 394 pp., \$8.00*

This collection of problems (with solutions) may be used in conjunction with any other textbook. It may also be used independently, for advanced reading, by students familiar with the basic ideas of quantum mechanics. All problems from the text by Gol'dman and Krivchenkov are included, together with a collection from that of Kogan and Galitskii.

There are two Appendices dealing with the semi-classical approximation and with isotopic spin, respectively.

From the Authors' Preface:

"This collection consists of problems in nonrelativistic quantum mechanics of varying degrees of difficulty, which were solved in seminars or were given as exercises to fourth-year students of the physical faculty of the Moscow State University. The more elaborate problems were intended mainly for students specializing in theoretical physics. . . ."

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APPENDICES—INDEX.

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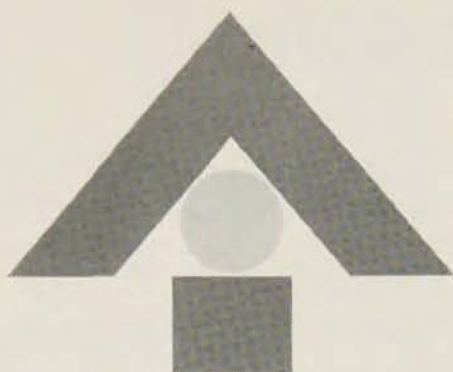


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erably greater emphasis on microscopic methods than Spitzer. The first six chapters lay the foundation by introducing the basic concepts of kinetic theory. The major tool of this analysis is the velocity distribution function whose moments in velocity space are related to the macroscopic variables. The next three chapters are devoted to the analysis of weakly ionized gases in which the only collisions to affect the motion of the electrons are those with neutral atoms. Going to larger electron densities collective phenomena are briefly discussed and the remaining two chapters deal with the microscopic and macroscopic description of the strongly ionized gas.

The presentation is generally clear but suffers somewhat from questionable translation of some of the French idioms. A favorite phrase of the author "au contraire" should not, for example, be translated as "on the contrary" but rather as "on the other hand". Similarly, the frequently occurring word "nevertheless" might generally have been replaced by "however".

The book is a good first introduction to the theory of ionized gases. It touches on most of the important concepts but without going deeply into any of them. For mathematical details the reader is frequently referred to original articles of Delcroix and his colleagues and at times to Spitzer's book.

Nuclear Physics and Instrumentation. Vol. 14 of Proc. of 2nd UN Internat'l Conf. on the Peaceful Uses of Atomic Energy (Geneva, Sept. 1958). 491 pp. \$17.00. **Physics in Nuclear Energy.** Vol. 15 of Proc. of 2nd UN Internat'l Conf. on the Peaceful Uses of Atomic Energy. 478 pp. \$12.50. United Nations, Geneva, 1958. *Reviewed by Joseph G. Hoffman, University of Buffalo.*

AMONG the 33 volumes of the English language edition of the Second United Nations Conference Proceedings, 1958, Volumes 14 and 15 are especially interesting for physicists. The highly technical discussions and reviews of fundamental work both in theory and in experiment will appeal to nuclear specialists and engineers in each of the many phases of nuclear physics considered.

Volume 14 has eighty papers in ten major subdivisions, the first of which deals with nuclear theory, nuclear models, and nuclear energy levels. Elaborate charts and tables make the section a comprehensive and useful summary of basic nuclear knowledge. There are, for instance, large folding tables of nuclides summarizing a vast amount of theoretical and experimental work. The second section describes nuclear reactions while the third goes on to special nuclei. The last six sections describe nuclear instrumentation and techniques such as spectrometry, counters, coincidence analyzers, bubble chambers, etc. The explicit detail given in most of these technique papers is amazing. For instance, one paper on pulsed neutron sources has six pages of shop diagrams for the mechanical construction of fast choppers.

Volume 15 has five main subdivisions on basic physics as related to energy, of which the first three deal