

optical holography, the list of potential applications hardly mentioned or ignored is large. However I do not cite this as a serious criticism, since there are a number of books entirely devoted to holography and its application, whereas Yu's book is a text on the broader subject of coherent optics and holography.

When compared with some other books on the market on this subject, the book doesn't fare badly. However in its present form it is marred by too many omissions, careless statements, misprints and notational problems. With the elimination of these drawbacks in a second edition, the book would have much greater appeal.

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Space Physics and Space Astronomy

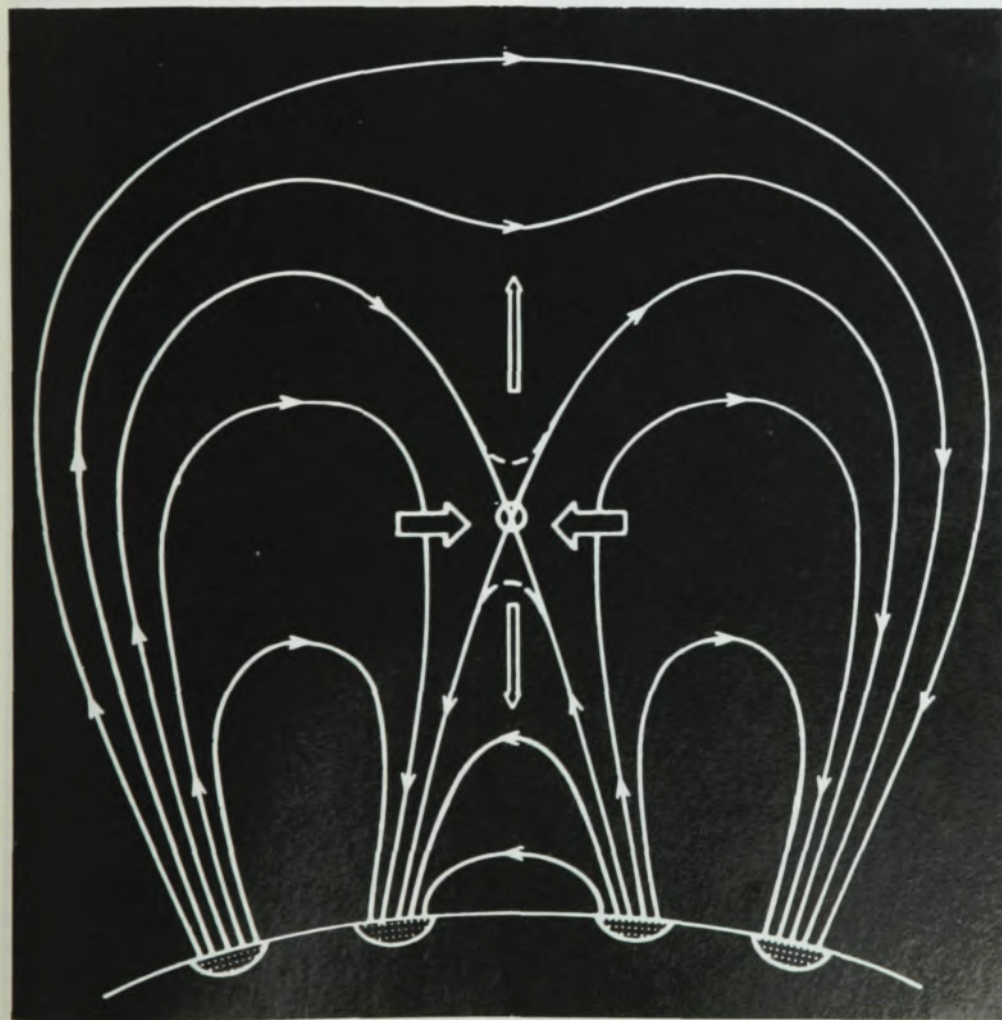
M. D. Papagiannis

293 pp. Gordon and Breach, New York, 1973. \$14.50

A very important result of the space program is the tremendous expansion

in our knowledge of the upper atmosphere, the interplanetary medium and the solar corona. Satellites can directly sample the ionosphere and magnetosphere, and ultraviolet and x-ray observations have contributed immensely to our knowledge of the active sun. The field of space physics has had an unfortunate tendency to get lost in the interdepartmental chasms of geophysics, physics and astronomy. M. D. Papagiannis's book, an introduction to space physics directed at the advanced undergraduate or beginning graduate student and the interested professional from other fields, is a welcome and well constructed bridge across this chasm.

The book covers the gamut of space physics. The first chapter, which deals with planetary atmospheres, is superficial and somewhat unrelated to the rest of the book. Papagiannis then reaches the heart of the field: ionosphere (including Chapman-layer theory), the magnetosphere and magnetotail, and the interplanetary medium. His chapters on the active sun and solar-terrestrial relations contain excellent accounts of the development of a typical active region and a typical geomagnetic storm. He finishes with a brief account of space astronomy. The book strikes a good balance between a



An instability develops at the neutral point of a moderately complex magnetic field over a sunspot group. From *Space Physics and Space Astronomy* by M. D. Papagiannis.

North-Holland Books

Theoretical Physics

An Advanced Text

by **B. G. LEVICH**, Institute of Electrochemistry, Academy of Sciences of the U.S.S.R., Moscow.

Translated from the Russian by **S. SUBOTIC**, Belgrade. Translation edited by **J. SCHNEPS**, Tufts University, Medford, Mass., U.S.A. and **A. J. MANUEL**, Leeds University, England.

This is the first edition of the famous textbook of theoretical physics widely used in Russian universities. The work, which is updated and expanded, is published in four volumes. The text is intended as an introduction to the theoretical physics and is written in such a way that all material necessary for understanding the later sections is covered earlier in the work.

Just Published

Volume IV: Quantum Statistics, Physical Kinetics

Volume 4 covers quantum statistics and the essential concepts of physical kinetics, which are not usually presented in a general course on theoretical physics. The rapid development of physics and the present wide interest in non-equilibrium and non-stationary processes has necessitated the expansion of the section on physical kinetics in this edition.

CONTENTS: Quantum statistics. Physical kinetics. The kinetic theory of gases and gaslike systems. The time correlation function method and Onsager's theory. Solid-state theory. Subject index. 1973, 420 pp., Dfl. 47.00 (about U.S. \$18.00)

Already Published

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1973, 642 pp., Dfl. 120.00 (about U.S. \$46.20)

Volume II: Statistical Physics, Electromagnetic Processes in Matter

1971, 668 pp., Dfl. 75.00 (about U.S. \$28.90)

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once-over-lightly treatment of many areas and the "block and gap" method, which gives the reader a somewhat distorted picture of the field. It is much less encyclopedic than R. C. Haymes's *Introduction to Space Science* and would serve well as a text for a senior-level course.

The book is fairly well written, though weak in spots. Papagiannis is at his best in describing the fields with which he is most experienced: solar physics and solar-terrestrial relations. He is an excellent guide to the confusing nomenclature and the vast quantities of data that the field's rapid advance has produced. The accounts of typical geomagnetic atoms and solar flares enable one to put into perspective the literature on x-ray bursts, radio bursts, plagues, and sudden ionospheric disturbances. The book is close enough to the current literature (the latest references are from 1971) that the reader can feel the excitement of current work in the field. It is very satisfying that one can now combine observations from many unrelated fields—radio astronomy, particle physics, geomagnetism, and solar physics, among others—into a broad picture that can successfully explain much of the data.

The main weakness of the book is in the treatment of the necessary plasma physics background. While Papagiannis assumes that his readers have only an introductory knowledge of electromagnetism, his derivations are sufficiently confusing that a second course in e-and-m or a plasma physics book at the reader's elbow are somewhat useful. Fortunately these derivations are fairly infrequent. His treatment of space astronomy is adequate, but does not convey the flavor of the field as well as his descriptions of space physics.

In spite of these minor weaknesses, *Space Physics and Space Astronomy* is an excellent textbook for an advanced undergraduate or graduate course in the field. Furthermore, anyone who wants to see how the space program has opened up exciting new disciplines should buy it, as it is the best book of its kind.

HENRY L. SHIPMAN
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Thermocouple Temperature Measurement

P. A. Kinzie
278 pp., Wiley, New York, 1973. \$14.95

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