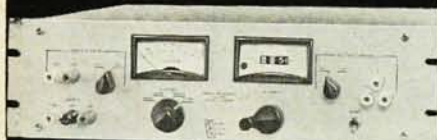


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analysis of the existence and uniqueness theorems about the boundary-value problems for both the linearized and the general nonlinear Navier-Stokes equations. The author claims that "the reader is not required to know more than the elements of classical and functional analysis". However, this reviewer, perhaps because he is more a physicist than a mathematician, feels that a sizable mathematical background is necessary. After an introductory chapter devoted to some points of mathematical technique in Hilbert space and in a generalized space introduced by Sobolev, a very careful and thorough study is made of the boundary value problem in the various possible conditions: linearized or nonlinear, stationary or nonstationary, problems. The attention is directed to source-free media. A number of existence and uniqueness theorems, for various sets of assumptions, is displayed, but, to be sure, the question of the unique solvability, in the large, of the general three-dimensional boundary value problem for the nonstationary Navier-Stokes equations remains open. A chapter is devoted to the theory of hydrodynamical potentials.

The book initially appeared in 1961. This is a revised edition, enlarged with comments on recent contributions to the field. It may thus be considered a really up-to-date monograph.

Photoelasticity. Symp. Proc. (Chicago, Oct. 1961). M. M. Frocht, ed. 294 pp. Pergamon, London, 1963. Distr. in US by Macmillan, New York. \$14.00.

Reviewed by **Walter G. Mayer**, Michigan State University.

The 1961 International Symposium on Photoelasticity in Chicago was the first such conference ever held in this country. The papers, before being presented during this meeting, were first reviewed and later edited for publication in this book. Since invitations to this symposium were restricted to "Western" countries, it can only be assumed that the book reflects worldwide research trends in photoelasticity and photoplasticity.

The main concern of the book is the description of industrial applications of new methods, the improve-

ment of known techniques, and, to some extent, an evaluation of some fundamental aspects of photoelasticity. Stress analysis is emphasized very strongly, and various methods are described, which utilize birefringent coatings. Investigations are not confined to two-dimensional stresses, in fact, a major portion of the book deals with three-dimensional photoelasticity. There are some survey articles—but most of the papers are rather specialized and deal with specific applications.

The book seems to be intended mainly for the engineering and industrial market, although occasional excursions into fundamental problems may make parts of it attractive to readers interested in the more general aspects of photoelasticity.

Space Research III. Wolfgang Priester, ed. Symp. Proc. (Washington, D. C., May 1962). 1275 pp. North-Holland, Amsterdam, 1963. Distr. in US by Wiley, New York. \$35.00.

Reviewed by **Herman Yagoda**, Air Force Cambridge Research Laboratories, Bedford, Massachusetts.

When confronted with a ponderous volume of 1275 pages containing 118 contributions by some 240 multilingual authors, the critic has indeed reason to be envious of the literati of the Sunday book review sections who can concentrate on the style, depth of thinking, and character portrayals of a contemporary novel dealing with human activities and emotions on our planet Earth. Space Research, Volume III, houses the final proceedings, all corrected, and hopefully augmented by data of improved statistical weight, given by the delegates who gathered in the State Department Auditorium in April 1962 to present and discuss physical observations of our space environment as telemetered by the latest satellites encircling the globe.

It was spring in Washington, the tulips, while no longer in their glory, could still be seen standing in their beds beneath the colorful azalea bushes. The white cherry blossoms were gone, their browning petals underfoot, but Hains Point with its longer-lived pink cherry blossoms was not far away. Under these idyllic conditions, it is conceivable that all delegates were not invariably present to

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listen to their contemporaries in related fields. The volume thus offers an opportunity to curl up during the winter months, if this can be done with a book weighing seven pounds, and study in detail the papers missed either through human weakness or the restrictions imposed by concurrent sessions.

The situation, however, is not quite this simple. The society has since held a 4th symposium, in June of 1963 at Warsaw, from which a proceedings volume of equal or greater size will eventually emerge. Since the investigators are now busy decoding information that will form the substance of the 5th symposium, planned for Florence in commemoration of the 400th anniversary of Galileo, one can well raise the question of where to find time for the study of somewhat antiquated earlier compendia. For the contents to be really useful the volume should be prepared by faster and less costly photo-offset processes.

It would be ungrateful not to mention that in the tradition of formally printed technical books, the editor W. Priester has maintained the fine quality of presentation and figure reproduction typical of Space Research I and II. In the galaxy of papers constituting volume III several contributions stand out as stars of the first magnitude. These selections necessarily reflect the tastes and interests of the critic. Two interrelated reviews, on plasma emission from the sun by C. deJager of the University of Utrecht and the acceleration and propagation of fast particles in interplanetary space by Juan G. Roederer of the University of Buenos Aires, help to correlate the vast amount of observations in this field. A. A. Mikhailov of the USSR Academy of Science reviews the methods employed in the measurement of the astronomical unit of length from the early parallax measurements of the 17th century to present-day radar techniques. He concludes that this fundamental parameter has a value of 149 550 000 km with a limiting error not exceeding ± 50 000 km. The use of cloud chambers to study galactic and solar electrons at balloon elevations by James A. Earl of the University of Minnesota is noteworthy in the use of

an old temperamentally land-based tool in a new difficult environment, which permits study of an extraterrestrial electronic component. God must have loved electrons, he made so many of them. Their ubiquity, however, confounds the experimentalist when seeking to establish their presence as a primary breed near the top of the atmosphere. The use of another established tool, one of somewhat lesser antiquity than the Wilson cloud chamber, the nuclear emulsion, is described by the US Naval Cosmic Ray Group as a means of studying the fragmentation of massive primordial cosmic-ray nuclei by collision with interstellar gas. Not all the contributions have as broad a scope. The volume contains a number of articles dealing with minor flares and magnetic storms, whose descriptive details will entice only a rather limited coterie. In general, the book represents a useful addition to the literature on space research.

Classical Electromagnetic Theory. By Nunzio Tralli. 308 pp. McGraw-Hill, New York, 1963. \$9.95.

Reviewed by **L. H. Bennett**, National Bureau of Standards and University of Maryland.

There are a surprisingly large number of advanced topics considered in this short text intended for senior undergraduate or freshman graduate physics students. Green's-function method, conformal mapping, the Hertz potential, and the electromagnetic stress tensor as well as the Lagrangian and Hamiltonian formulations of the electromagnetic field are all presented. An interesting feature is the introduction of the magnetic field after special relativity. An elementary mathematical treatment of vectors and tensors comprises the first chapter.

The trick to presenting so many topics in so short a space is brevity of treatment. There is, in fact, very little of the type of discussions which characterize texts such as those by Panofsky and Phillips or by Jackson. Thus, this book is not useful for self-study, but, of course, it is not intended for this purpose. Some teachers will like the brief presentations, preferring to fill in the discussion in class. An example of the brevity is found in the