



send for the leading
**ELECTRONIC
SUPPLY GUIDE**

Free!

**ALLIED'S
452 PAGE 1959
CATALOG**

Save time, effort and money—send your orders to **ALLIED**—the dependable, complete source for your Electronic equipment needs. We make fast shipment from the world's largest stocks of:

- Special-Purpose Electron Tubes & Transistors
- Lab Test and Measurement Instruments
- Audio Amplifiers and Associated Equipment
- Electronic Parts and Components of All Types

Let our experts fill *all* your Electronic Supply needs. Send today for your **FREE** copy of our 1959 Catalog—the complete, up-to-date buying guide to *everything* in Electronics.

ALLIED RADIO

100 N. Western Ave., Dept. 62-L8
Chicago 80, Illinois

ELECTRONICS RESEARCH ENGINEER (INSTRUMENTS)

Responsible for nuclear instrumentation—fission chambers, ionization chambers, counters—for nuclear ramjet development. Must know nuclear calculations for instrument moderation and shielding. Work deals with very high temperature and severe vibration environments.

Will establish instrumentation specifications, conceive packaging to fit application, plan test programs, and coordinate work with outside agencies.

Degree in Engineering or Physics with appropriate advanced study and experience. Small, responsible engineering group provides professional environment.

Contact: **Floyd E. Hargiss, Manager**
Professional Personnel
Marquardt Aircraft Co.
16560 Saticoy Street
Van Nuys, California

MARQUARDT AIRCRAFT CO.
Van Nuys, Pomona, California—Ogden, Utah

sary for producing $p-n$ or $n-p-n$ junctions in semiconductors. Single crystal growth is readily accomplished as a valued incidental.

An excellent balance between theory and practice is maintained throughout, and the references cite all of the important work to date. Not the least valuable part of the book is the collection of theoretical zone-refining curves reproduced in the appendix. These give the relative solute concentration versus distance along the ingot for various values of the distribution coefficient and number of zone passes.

This is a book which should have lasting value for all metallurgists, chemists, and physicists who are confronted with the problem of controlling the chemical composition of crystalline solids.

Elementare Neutronenphysik. By K. Wirtz and K. H. Beckurts. 243 pp. Springer-Verlag, Berlin, Germany, 1958. Paperbound DM 49.60. *Reviewed by Hans Bichsel, University of Washington.*

Mr. Wirtz, director of a reactor school in Karlsruhe (Germany), together with Mr. Beckurts has written an introduction to the methods of a laboratory for neutron physics. This is a laboratory in which quantities like neutron flux, diffusion length, Fermi age, and absorption cross sections are measured in connection with the investigation of reactors and reactor techniques.

The first half of the book deals with the theory of diffusion and transport of neutrons. After a general discussion of the necessary concepts such as neutron flux (the words "Neutronenfeld" and "Neutronenfluss" are used in the text) and diffusion, a number of elementary problems for the diffusion equation are neatly solved. Scattering and spatial distribution of neutrons in various media are dealt with in the following chapters.

In the second half of the book the measurement of neutron fluxes and diffusion lengths is treated. Chapters 7 and 8 are concerned with neutron detection. Only one section deals with prompt detectors in a very abbreviated form, while nine sections are devoted to the thorough discussion of induced radioactivity and its production in various detectors. Chapter 9 gives a number of methods for the absolute determination of neutron fluxes and neutron yields of several neutron sources. The last three chapters discuss the measurement of diffusion length and neutron temperature for a stationary case in a moderator and pulsed neutron sources and fields. The treatment of the subject matter is not always at an elementary level; it is nevertheless clear. Ample references for further reading are given at the end of each chapter.

The title of the book may be somewhat misleading to a nuclear physicist insofar as "neutron physics" to him in general would refer to the study of the properties of the neutron, cross sections, neutron production, neutron reactions, and neutron detection with prompt detectors. Very little space in the book is devoted to

LOW TEMPERATURE SOLID STATE MASER RESEARCH*

You, too, can PIONEER on such new frontiers

At TEXAS INSTRUMENTS, you can apply your Master or Doctorate specialty under conditions of substantial freedom. Explore scientific horizons with outstanding associates . . . using facilities that permit work of highest technical caliber. Expand your professional potential in free exchange of ideas . . . in an atmosphere where you and your work are recognized as vital.

Favorable research climate is a major factor in the swift growth of this 28-year-old company whose sales rate has increased 20-fold over the last decade. Recognition of individual talent and achievement has helped Texas Instruments grow to be one of the 500 largest industrial companies in the country. To pace TI's leadership, the Central Research Laboratory will soon move its expanding scientific community into a new building designed to establish an even finer creative environment.

Avail yourself of this opportunity for self-expression in creative research. In addition, enjoy TI's generous personnel benefits as well as encouragement and assistance in personal development. TI labs are in the city yet away from downtown traffic . . . within minutes of fine residential areas, cultural activities, churches, highly rated schools and, of course, year-around *outdoor* recreation in the pleasant climate of the Southwest.

BASIC & APPLIED RESEARCH Masters and PhD's interested in these activities, please write **A. E. Prescott**.

In addition to research, there are excellent openings for ME's and EE's, electronics engineers especially, in—**ELECTRONIC & ELECTROMECHANICAL APPARATUS** Radar, sonar, infrared, optics, magnetics, telemetering, communications, computers, transformers. Write **John Pinkston**.

For **SEMICONDUCTOR DEVICES & OTHER COMPONENTS** Transistors, diodes, rectifiers, capacitors, resistors, transistor circuit applications, test equipment, mechanization, write **Harry Laur**.

***LOW TEMPERATURE PHENOMENA.** While commercial applications in this field may be some time away, the potential is so great in TI's areas of interest that we are engaged in a broad, basic approach to the problems involved. This activity is only one of some 20 subjects now under study at Texas Instruments—covering basic and applied research in solid state physics, materials, devices, data systems, and earth sciences; concentrating on semiconductors, electroluminescence, ferromagnetics, magnetic resonance, superconductivity, dielectrics, infrared, geophysics, computers, memories, and transistors plus physico-chemical studies of diffusion, alloying, crystal growth, and crystalline perfection.



TEXAS INSTRUMENTS
INCORPORATED

6000 LEMMON AVENUE • DALLAS 9, TEXAS

BOOKS

from Prentice-Hall...

1 INTRODUCTION TO MODERN PHYSICS

by CONVERSE H. BLANCHARD, CLYDE R. BURNETT, RICHARD G. STONER, and ROBERT L. WEBER, all of Pennsylvania State University

PRESENTING THE QUALITATIVE IDEAS AND SIMPLER QUANTITATIVE RESULTS of microscopic physics, this book is aimed more at broadening and strengthening the understanding of physics as a discipline than toward developing a familiarity with applications. Many applications are, however, pointed out.

The basic concepts of atomic and nuclear physics, including a chapter discussing molecular spectra, chemical bonds, and solid state physics, are presented with a minimum of mathematical complications.

414 pp. Pub. 1958 Text price \$7.50

2 REVIEW OF COLLEGE PHYSICS (3 Vols.)

by ROBERT L. WEBER, Pennsylvania State University

COMPLETELY UP-TO-DATE, REVIEW OF COLLEGE PHYSICS, strives to give the student the mastery of physics that comes from problem solving, coupled with mature understanding of general physics through a knowledge of physical principles. Volume I discusses Mechanics, Wave Motion, and Sound. Volume II—Heat, Thermodynamics, Kinetic Theory Electricity and Magnetism. Volume III—Light, Atomic and Nuclear Physics.

Paper bound Pub. 1958 Text price \$2.25 each vol.

3 COLLEGE PHYSICAL SCIENCE

by WENDELL SLABAUGH, Oregon State College and ALFRED B. BUTLER, State College of Washington

IN THEIR NEW TEXT, SLABAUGH AND BUTLER EMPHASIZE and correlate the soundest principles of physical science. Starting with the four primary concepts of space, mass, time, and energy, the authors treat these topics as the basis for the development of the many areas of physical science. These fundamentals are then applied to geology, astronomy, chemistry, and physics.

A narrative style of discussion, original drawings, and photographs complement the subject matter and further stimulate student interest.

496 pp. Pub. 1958 Text price \$7.75



To receive approval copies promptly,
write: Box 903

PRENTICE-HALL, Inc.
Englewood Cliffs, New Jersey

this kind of neutron physics: in the first two chapters a number of the concepts are presented concisely enough. In the discussion of neutron production with nuclear reactions, several of the Q -values listed do not agree with the values generally accepted in this country (e.g. the reaction $B^{11}(\alpha, n)N^{14}$ has a Q -value of 0.154 Mev, listed in the book is 0.28 Mev). It has not been checked whether similar inaccuracies occur at other places.

A useful annex gives data about radiation protection, integration of neutron flux in finite volumes, tables for radioactive decay, and tables of cross sections. In a list of symbols used in the text, it would be convenient to have the English equivalents of the German terms, which, according to the author, were derived from the English-American terminology. If that were done, no confusion would occur in translation back to the original language.

Physics of Nuclear Fission: Supplement No. 1 of the Soviet Journal *Atomnaya Energiya*. Translated from Russian by J. E. S. Bradley. 182 pp. Pergamon Press, London & New York, 1958. \$9.00. Reviewed by E. R. Rae, A.E.R.E., Harwell, England.

This book is a translation of a special supplement to the Soviet Journal *Atomnaya Energiya* containing the papers read at a conference on the physics of nuclear fission, held in January 1956 at the Atomic Energy Institute of the Academy of Sciences of the USSR. The conference papers cover many aspects of fission, and report the work done in this field in many countries, including much Russian work otherwise inaccessible to the English-speaking reader. Larger numbers of experimental results are listed, compared, and criticized, the topics discussed including, among others, fission cross sections, asymmetry of fragment masses, angular distributions, neutrons from fission, emissive fission, spontaneous fission, and photo-fission.

Since the book contains twelve relatively independent papers, there is inevitably some repetition of data and argument; there is also the more serious criticism that the conference on which the book is based took place over two years ago, and so certain important recent development which have a bearing on fission physics received little or no attention. For example, the behavior of fission cross sections in the resonance region, and Aage Bohr's channel analysis of fission are mentioned only briefly, and Porter and Thomas' analysis of the distribution of fission widths in the resonance region appeared too late to be mentioned at all.

The translation from the Russian is, on the whole, very good and the English reads easily. Unfortunately this is not everywhere true, and there are places, particularly in the first paper (see for example the first half of page 8) where the meaning of the text is obscure, and the fault would appear to be that of the translator.

There can be no doubt that there is a need for a review of the present state of knowledge on fission.