

Book Reviews

High Magnetic Fields. Proceedings of the International Conference on High Magnetic Fields, held at the Massachusetts Institute of Technology, Cambridge, Massachusetts, November 1-4, 1961. Sponsored by the Solid State Sciences Division of the Air Force Office of Scientific Research. Edited by HENRY KOLM, BENJAMIN LAX, FRANCIS BITTER, AND ROBERT MILLS. M.I.T. Press, Massachusetts Institute of Technology, and Wiley, New York, London. 751 pp., 419 figures. \$15.00.

The editors of these proceedings are well known experts in the production and the use of high magnetic fields: Henry H. Kolm did outstanding work in the development of pulsed-field and powerful continuous-field magnets. Benjamin Lax is well known for his important research work in solid-state. He is director of the National Magnet Laboratory at MIT and head of the solid-state division of Lincoln Laboratory. Francis Bitter, professor at MIT, is an authority in magnetics and did pioneer work in designing high field water cooled magnets ("Bitter Magnets"). Robert G. Mills, in his capacity as division head of the Plasma Physics Laboratory at Princeton University, contributed greatly to the development of research machines for thermonuclear studies.

The International Conference on High Magnetic Fields had an attendance of nearly nine hundred participants including persons of eleven foreign countries. Not less than 86 papers were presented. In this volume, these papers are arranged as logically as possible in four parts devoted, respectively, to (1) the generation of high fields, (2) high-field research programs at a number of centers throughout the world, dealing with both the generation and the use of high fields, (3) high magnetic fields in solid-state and low temperature physics, and (4) the use of high fields in plasma physics.

The papers presented are in general on a high scientific level. Unfortunately, available space permits listing only a few outstanding lectures of each of the mentioned four groups. F. Bitter talked on water-cooled magnets, D. B. Montgomery on iron magnet design, and H. P. Furth on pulsed magnets. A series of lectures concerned high-magnet field research programs of several well known laboratories (for instance, the Clarendon Laboratory in Oxford and the Cavendish Laboratory in Cambridge, England, the Kamerlingh Onnes Laboratory in Leiden, Holland, the National Magnet Laboratory at the MIT in Cambridge, Mass.). B. Lax presented a paper on magnetospectroscopy in solids, and Nicholas Kúrti discussed the use of high magnetic fields in low temperature physics. Actual problems in superconductivity were covered by 15 papers concerning superconducting materials and superconducting magnets (J. E. Kunzler, S. H. Autler, and others). Finally, applications of high magnetic fields in plasma, fusion, and particle physics were well represented by experts like B. Lehnert (Stock-

holm), R. G. Mills (Princeton, N. J.), F. H. Coensgen (Livermore, California), and several others.

Three sessions of the conference were devoted to *biomagnetism*; however, these lectures were not included in this volume since it was felt that these papers would be more appropriate in the pertinent journals.

The proceedings of the International Conference on High Magnetic Fields give an excellent picture on the actual state of this extensive field of research and development and includes complete lists of references on previous work. This volume is at this time the best reference book available.

W. F. GAUSTER

*Oak Ridge National Laboratory
Oak Ridge, Tennessee*

(About the Reviewer: Wilhelm F. Gauster was educated at the University of Technology in Vienna where he served later as professor of electrical engineering. He came to North Carolina State College in the same capacity in 1950. Since 1957 he has been at Oak Ridge National Laboratory where he heads the engineering sciences group of the Thermonuclear Division.)

NS 323, 0 Tables, 0 Figures

Nuclear Reactor Instrumentation. By M. W. JERVIS. Temple Press, London. 74 pp., 24 figures, \$2.95. Distributed in U.S.A. by Simmons-Boardman, New York.

M. W. Jervis is Senior Engineer, Electrical Department, The Nuclear Power Group.

This monograph is intended for university and technical college students, research assistants, and qualified technicians who require a broad understanding of those topics of nuclear engineering outside their own field of study.

The author covers all aspects of instrumentation of a nuclear power plant. The references and illustrations are for a gas cooled power reactor, but this in no way detracts from the value of the monograph. The material as presented will give the reader an excellent picture of what is required in instrumenting nuclear power plants in general. The typical numerical values used by the author serve to further increase the value of this monograph by giving the reader concrete information which is more than just descriptive.

In the first chapter the cost of instrumentation and elementary reactor kinetics are discussed. Chapter 2 covers reactor temperature instrumentation, thermocouples, potentiometer recorder-indicators, automatic data loggers, and high temperature safety amplifiers. Chapter 3 discusses methods to measure reactor power by nuclear measurements outside of the reactor core, neutron sources, neutron sensitive ionization chambers, gamma compensation, fission chambers, boron trifluoride counters, boron lined counters, fission counters, scintillation counters, linear current amplifiers, logarithmic current amplifiers, period meters,