BOOK REVIEW

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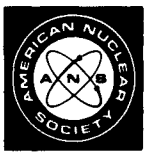

Introduction to Nuclear Radiation Detectors

Author P. N. Cooper

Publisher Cambridge University Press, New York

Pages 143

Price $34.50 (hardback)

Reviewer Mary Gerry White

Intended as a general textbook for undergraduate students, this volume covers the basics of nuclear radiation detectors. The author accomplishes his purpose with material concerning the essential principles of radiation detection.

Chapters are presented on ionizing radiations (including an introduction to neutron energy and its detection); statistics of particle counting (with a definition of the Fano factor, a consideration in the calculation of energy resolution in semiconductor detectors); gas-filled detectors; Geiger-Mueller counter; scintillation counters (which includes a brief discussion of burst cartridge detection and Cerenkov detectors); semiconductor detectors; and electronics for nuclear detectors. This volume does not include information on the detailed circuits involved with detection instrumentation.

Another chapter covers material that will be extremely useful as a reference for health physicists in radiation protection planning, particularly in the calculation of dose rates from ionizing radiation sources. "Radiation Doses and Their Measurement" includes an excellent discussion of definitions, relationships of permissible dose limits to adequate measurement of dose rates (internal and external), and advisory instruction in the purpose of, hence the general selection of, appropriate instrumentation systems for detection measurements. The author also discusses the basic theory and utilization of the film badge and thermoluminescent dosimeter. Radiation protection measurement planning information, which would strengthen the volume, would include more detailed emphasis on the importance and types of detector calibrations, and data management systems for temporary and permanent documentation reporting and retrieval. The author's literature references and index adequately permit extensions of student or reader knowledge of nuclear radiation detectors.

This succinctly written text is a much needed and well-done volume prepared by a recognized scholar in the field. It will be useful to both undergraduate and graduate students as a text and certainly will be a long-lasting reference volume for persons in nuclear-related disciplines or for those researching the basic functions and uses of nuclear radiation detectors for decision making in instrument selection planning.

Mary Gerry White is currently a research specialist in the nuclear and energy engineering department at the University of Arizona. She formerly served as program manager and later as technical measurements and quality assurance manager for U.S. Department of Energy remedial action programs, specializing in waste management problems relating to environmental migration of low-level, high-level, transuranics, and other radionuclides from waste generated in defense and commercial activities.