BOOK REVIEWS

Selection of books for review is based on the editor's opinions regarding possible reader interest and on the availability of the book to the editor. Occasional selections may include books on topics somewhat peripheral to the subject matter ordinarily considered acceptable.

Radiation Detection and Measurement, 2nd Edition

Author Glenn F. Knoll

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Reviewer William H. Miller

Since the first edition of Glenn Knoll's book *Radiation Detection and Measurement* was published in 1979, it has been a welcome addition to the field. This book is useful both as a text for classroom use and as a general reference for anyone needing background information on radiation detection systems and their use.

Prior to 1979, essentially no state-of-the-art books were available for radiation detection and measurement. Price's *Nuclear Radiation Detection* was published in 1958 and updated in 1964, and by 1979 was very much out of date. Price was based primarily in the fundamentals of radiation detectors and their design but was somewhat limited in its coverage of the practical aspects of utilization. Knoll's book in 1979 was followed by Tsoulfanidis' text *Measurement and Detection of Radiation* in 1981. These two books filled an obvious void in the literature.

The second edition of Knoll's book contains necessary modifications, additions, and updates to reflect changes in the field during the past 10 years. The first four chapters cover basic concepts in radiation detection, including sources of radiation, radiation interactions, statistics, and general properties of detectors. He then devotes one chapter to the major types of radiation detectors, including ionization chambers, proportional counters, and Geiger-Mueller counters; three chapters to scintillation detectors and spectroscopy systems; three chapters to solid-state detectors; and two chapters to neutron detectors. The final five chapters cover many practical aspects of radiation detection including pulse processing and shaping, amplifying circuits, linear and logic systems, multichannel systems, and background shielding. This last section on instrumentation is quite useful to a person setting up a radiation detection system or who must specify equipment for a new system. Nuclear instrumentation module and computer-automated measurement and control standards, which are widely used in the industry, are also listed in an appendix.

I find the book to be excellent both as a classroom text and as a reference. As a textbook, the second edition includes approximately twice as many problems at the end of each chapter as did the first edition, which is useful for an instructor as well as for the student. There is more material present than can be covered in detail in a semester, so the instructor may want to select a limited number of topics for emphasis.

As a reference, the book covers essentially every radiation detection system in use today. Additionally, each chapter is heavily referenced (in excess of 100 citations in several chapters), making it easy for the reader to find more detailed information on a specific system if necessary. A significant feature of Knoll is the inclusion of the last chapters concerning electronic systems and the practical matters associated with the operation of a radiation detection system. This information was often not included in earlier texts. For those wanting to set up a radiation detection system, this part of the book should prove to be most valuable, and it also enhances the usefulness of the text as a reference.

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