that he was on the faculty at the Georgia Institute of Technology, where he went after receiving a PhD from the University of Minnesota in 1964. He teaches courses across the spectrum of the thermal sciences and has published more than 60 papers on heat transfer in plasma systems, heat transfer in frost layers, and thermophysical property measurement.

Active Non-Destructive Assay of Nuclear Materials
(Principles and Applications)

Author	Tsahi Gozani
Publisher	National Technical Information Service Springfield, Virginia (1981)
Pages	403
Price	$30.00
Reviewer	Glenn F. Knoll

This book contains a good representation of the experimental and analytical techniques that have been developed over the past 15 years for the active nondestructive assay (ANDA) of fissionable materials. While the topic is somewhat specialized, many of the techniques and principles are potentially applicable to other areas of nondestructive examination. The author concentrates on active methods of assay in which an external source of neutrons or gamma rays is used. The secondary radiations created by interaction of these "interrogation" radiations then provide information on the composition of the object.

The author begins by presenting an overview of the different physical approaches to ANDA in the first chapter. To provide a background, there then follow discussions of the fundamental interaction of neutrons and gamma rays with matter and a review of neutron and gamma-ray production mechanisms and sources. Additional chapters then discuss the more specialized topics of the transport of gamma rays and neutrons in the type of bulk material of interest in ANDA, and the signatures of neutron- and photon-induced fissions. A general review is given of neutron and photon detection systems with emphasis on those aspects of the instrumentation of most significance in assay measurements. Finally, the book concludes with two chapters that present representative complete systems for ANDA and considerations in the analysis of instrument response and calibration of these systems.

The exposition style of the text is reasonably clear. The continuity in some sections suffers from an excessive number of footnotes, which seem to have been added as afterthoughts. In an applied text of this sort, it is understandable that non-SI units such as gallons and barrels must be used to suit convention. However, there are numerous examples of the misuse of SI units (e.g., double solidi in compound units), and the newer SI units for activity and radiation dose are not even mentioned.

As one would expect, the text draws heavily from published journal articles and reports for much of the data that are presented. However, a large fraction of the tables and figures appear without citation of the original source. Not only is this omission a discourtesy, but it also prevents the reader from seeking verification or elaboration of the information elsewhere. References are collected at the end of each chapter and include a good assortment of books, reports, and journal articles that are relevant to each topic. In a book carrying a 1981 publication date, however, it is disappointing to see that most of these references date back to the early 1970s.

Some of the technical background presented is so abbreviated as to be misleading (for example, the discussion of pulse shaping). However, the topics that are unique to ANDA are generally presented with excellent clarity and completeness. For example, the treatment of fission multiplicity detectors and the related discussion of efficiency and chance coincidence rates in multiple coincidence systems is extremely valuable and unduplicated in any other single source.

The text does not provide a subject index. While this omission might present some difficulty for the casual reader, the organization is such that it is relatively easy to locate any specific topic, once familiarity is gained with the overall contents.

On the whole, the book is a valuable summary of ANDA measurements in nuclear safeguards. Because of the completeness of its presentation of both the principles and applications, it should be useful to all readers whether or not they have prior experience in the field.

Glenn Knoll has been a member of the nuclear engineering faculty at The University of Michigan for 20 years, where he now serves as professor and chairman of the department. His research interests have been in the areas of nuclear instrumentation and radiation measurements, and he has authored the widely adopted text Radiation Detection and Measurement. *He is currently engaged in nuclear cross-section measurements and in the development of radiation instrumentation for medical applications.*