

---

# JNMT Bookshelf

---

## **FUNCTIONAL MAPPING OF ORGAN SYSTEMS AND OTHER COMPUTER TOPICS**

Peter D. Esser, editor, Society of Nuclear Medicine, New York, 1981, 272 pages, \$28.00 nonmember, \$19.00 member.

This volume is the proceedings from the 11th Annual Symposium on the sharing of computer programs and technology in nuclear medicine. Twenty-five papers are divided into five sections: 1) Functional Mapping: Imaging of Organ Systems, 2) Functional Mapping: Imaging of the Cardiac System, 3) Tomographic Imaging, 4) Image Display, and 5) Computers and Instrumentation.

The papers vary in quality from excellent to adequate. The best are usually the most technical, while general discussions are the weakest. Multiple illustrations contribute to the book's value.

This book is not for everyone, but it will serve as a reference for those with an interest and dexterity in computers in nuclear medicine.

HAROLD A. GOLDSTEIN, MD  
Veterans Administration Medical Center  
Philadelphia, Pennsylvania

## **PHYSICS IN NUCLEAR MEDICINE**

James A. Sorenson and Michael E. Phelps, Grune & Stratton, New York, 1980, 404 pp, \$39.50.

These two noted authors have collaborated to produce a useful textbook which, as the title suggests, covers the physics of nuclear medicine. One should not, however, be misled by the title into believing that this is more than an introductory text. The style of presentation makes for a very readable book and the authors have gone to considerable lengths to include many cross-references, as well as useful tables, concise illustrations, and helpful mathematical examples. The latter are particularly good and are used in a progressive fashion to develop the theme of a section or chapter. One instance of such progression is in the section concerned with the calculation of internal radiation dosimetry.

The chapters cover the basic principles of atomic and nuclear physics, radioactivity and radioactive decay, radiation detectors and basic radiation counting electronics, nuclear counting statistics, production of radionuclides, radiation interactions and dosimetry, nuclear counting and imaging instrumentation, and radiation

safety and health physics. Five appendices contain some lists and tables of information important to physics in nuclear medicine.

The order of presentation of material leaves something to be desired. The chapters dealing with the interaction of radiation with matter follow, rather than precede, that on detectors. One might also question the wisdom of the position of the chapter on production of radionuclides, which would be more appropriately placed earlier in the book. The aforementioned cross-referencing does help to alleviate any problem the reader may have with the order in which the topics are introduced, though a different sequence would probably have reduced the amount of forward referencing required.

The authors have been careful to keep the text relatively free of mathematical formulae, which is so very frequently a difficulty with physics texts. The more inquisitive reader can, however, follow the development of some equations in footnote form. References to other texts help in those cases where a more rigorous analysis is sought.

A few minor errors can be detected. Equation 3-17c on page 44 contains a typographical error that causes it to have a denominator of zero. On page 167 another typographical error occurs in the fourth line of the answer to the example. A rather more serious error is the statement in the chapter on Electronic Instrumentation, on page 83 under "Timing Methods," which implies that the location of events in a scintillation camera is dependent on timing rather than pulse height. This method of localization was only used in the delay-line camera developed by Tanaka and his associates. None of the present scintillation cameras commercially available uses this method of localization.

If any major criticism can be leveled at this book it is the one of omission. It is very difficult for any author of an introductory text to decide to what depth a subject should be explored and to determine what should be included as necessary or rejected as unsuitable. Considering the value of "fission-moly", it is difficult to understand, however, why fission products should be dismissed in two brief sentences when photo-nuclear activation is given a whole subsection. Similarly, the section on three-dimensional imaging techniques fails to mention 7-pinhole or rotating collimator tomography and, in this reviewer's opinion, quality control procedures are dealt with far too briefly in relation to their importance.

*(Continued on next page)*

*(JNMT Bookshelf continued)*

With the introduction of SI units it is unfortunate that they are only mentioned (page 33) and not used throughout this book. This, of course, will tend to date the book quickly, as will the fact that the energy and linearity methods of correction for scintillation camera nonuniformity are not considered at all. In the chapter on health physics the authors refer to the outmoded  $(N-18) \times 5$  formula for maximum permissible accumulated dose. Perhaps these omissions are indicators of the publication date and the time that it takes to get a manuscript to press.

Some simplifications can be forgiven in the context of producing a basic text. I am not sure, however, that the equating of dead time with resolving time (page 220) is entirely justified. Another oversimplification is to rate blood-forming organs, the gonads, and the lens of the eye as all being "especially sensitive" to radiation. One

must keep the consequences of radiation damage in mind when establishing radiation sensitivity. In this same context the authors imply that genetic effects have a similar risk as carcinogenesis.

In summary, the book is a good introductory text on physics in nuclear medicine. It is written with clarity but has some serious omissions that will cause it to age rapidly. Any errors or inaccuracies are sufficiently minor in nature that they do not detract from the value of the book as a whole. It is certainly applicable to an audience of student technologists and nuclear medicine residents seeking a readable, basic text. It is unlikely to meet the needs of a scientist studying to become a specialist in nuclear medicine.

T.D. CRADDUCK, PhD, FCCPM  
Victoria Hospital  
and University of Western Ontario  
London, Ontario, Canada