Michael E. Phelps (ed) PET: physics, instrumentation and scanners. Springer, New York, 2006, 130 pp, 77 illustrations. Hardcover. \$59.95. ISBN-10: 0-387-32302-3, ISBN-13: 978-0-387-32302-2

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This book is intended as a handbook on the principles of PET imaging, proceeding from the basic physics behind positron emission through to the techniques of analysis of PET images. Thereby the reader is guided through the processes of instrumentation design, data acquisition and image reconstruction.

In the best “M.E. Phelps” tradition, the book is extremely well focussed, covering all the technical aspects necessary for a proper understanding of the generation of PET images. Furthermore, the reader will require only basic physics knowledge (well within the expertise of residents and technicians) to fully grasp all the covered arguments.

PET image generation is explained according to the following chapter scheme: “Physics of Positron Emission and Annihilation”, “511 keV Photon Interactions in Matter”, “511 keV Photon Detectors”, “Data Collection and PET System Configurations”, “Data Correction”, “Image Reconstruction” and “Image Analysis”. Additionally, the last two chapters of the book (“Performance Evaluation of PET Systems” and “PET System Design”) provide up-to-date information on the design and performance of PET scanners, including a brief section on animal scanners.

In these dense 130 pages all aspects are treated in clear language and with relative simplicity, so that the reader is never discouraged by the complexity of some of the subject matter. Also, the tests and exercises intermingled in the text are very helpful as they force the reader to pay more attention to those concepts most critical to an understanding of the phenomena underlying PET imaging.

All the chapters of the book include appropriate schemes of the physical principles and images of PET acquisition that definitely serve to clarify the discussion in the text. The final chapters on PET scanners include a valuable table that compares the principal features of several commercially available clinical PET systems.

In summary, we think this book will be extremely valuable reading both for nuclear medicine physicians, who will find it useful in refreshing knowledge of basic concepts and as a quick reference, and for technicians and residents who are starting their work on PET. It is concise but supplies all the information necessary for a clear understanding of PET physics. This ability to provide a complete overview of the basics of PET within a very small space means that it should find a place on the shelf of every PET user.

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