



Measurement and Detection of Radiation, Fourth Edition

By Nicholas Tsoufanidis, Sheldon Landsberger

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A Sound Introduction to Radiation Detection and Measurement for Newcomers to Nuclear Science and Engineering

Since the publication of the bestselling third edition, there have been advances in the field of radiation detection, most notably in practical applications. Incorporating these important developments, **Measurement and Detection of Radiation, Fourth Edition** provides the most up-to-date and accessible introduction to radiation detector materials, systems, and applications.

New to the Fourth Edition

- New chapters on nuclear forensics and nuclear medicine instrumentation, covering basic principles and applications as well as open-ended problems that encourage more in-depth research
- Updated references and bibliographies
- New and expanded problems

As useful to students and nuclear professionals as its popular predecessors, this fourth edition continues to carefully explain the latest radiation detector technology and measurement techniques. It also discusses the correct ways to perform measurements and analyze results following current health physics procedures.

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Editorial Review

Review

"This textbook is a must-have for everyone who studies, teaches, or uses cutting-edge applications of radiation detection and measurements."

?Miltos Alamaniotis, Ph.D., School of Nuclear Engineering, Purdue University

"The organization of the book is ideal for undergraduate nuclear engineering laboratory classes, and I think it is very well written. Also, it has many examples of calculations that definitely enhance one's ability to understand the material."

?Lawrence F. Miller, Professor of Nuclear Engineering, The University of Tennessee

"... an excellent teaching resource for both undergraduate and graduate courses in radiation detection. The numerous examples and exercises have helped my students learn to apply fundamental and advanced concepts in radiation detection. I have used the third edition in my classes for the past four years, and I look forward to the publication of the new edition."

?John Mattingly, Professor, Department of Nuclear Engineering, North Carolina State University

"Nuclear instrumentation and measurement are key aspects that contribute to the quality of scientific programs in the fields of physics, energy, fuel cycle, waste management, safeguards, and homeland security. Furthermore, measurements relying on nuclear physics now play an important role in various fields of application such as biology, medicine, and the environment. Nicholas Tsoulfanidis and Sheldon Landsberger through this fourth edition successfully realize the challenge to cover all these application areas that use instrumentation and radiation detection."

?Prof. Dr. Abdallah Lyoussi, National Institute for Nuclear Science and Technology (INSTN), French Atomic Energy and Alternative Energies Commission (CEA)

"... concise and comprehensive ... very useful for students, academics and professionals in the development and application of sensors for ionising radiation and beyond."

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"This one-of-a-kind book is invaluable in teaching laboratory-based introductory courses in radiation measurement techniques. The new chapters on nuclear forensics and nuclear medicine are important additions to the previous edition's chapters on radiation measurement applications."

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"One of the very few books with cross sections, efficiencies, major reactions, standard detectors ... all together. A single stand-alone resource for advanced undergraduates through research level with full references."

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"An excellent text that covers counting statistics, radiation interactions with matter, and the basics of radiation detector design."

?Steven R. Biegalski, Professor, Department of Mechanical Engineering, The University of Texas at Austin

"A large amount of graphic illustrations and in-text examples make it an excellent textbook or reference for teaching undergraduate or graduate students. It nicely covers the relevant areas in ionizing radiation detection, and gives a good introduction to emerging areas in nuclear detection such as nuclear forensics and nuclear medicine. I highly endorse the book."

?Lei R. Cao, Director, Nuclear Analysis and Radiation Sensor Lab, Department of Mechanical and Aerospace Engineering, The Ohio State University

"... offers the perfect level of material for undergraduates in the radiological sciences."

?David M. Hamby, Professor, Department of Nuclear Engineering and Radiation Health Physics, Oregon State University

About the Author

Nicholas Tsoulfanidis is a nuclear engineering professor emeritus of the Missouri University of Science & Technology and an adjunct professor at the University of Nevada, Reno. He is an active member and Fellow of the American Nuclear Society and the author of the book *The Nuclear Fuel Cycle*. He was the editor of the international journal *Nuclear Technology* from 1997 to 2015. He has been a recipient of the Glenn Murphy Award from the Nuclear and Radiological Division of the American Society of Engineering Education and the Holly Compton Award from the American Nuclear Society. His research focuses on radiation transport, radiation protection, and the nuclear fuel cycle.

Sheldon Landsberger is a professor in the Nuclear and Radiation Engineering Program in the Department of Mechanical Engineering at the University of Texas at Austin, where he currently holds the Texas Atomic Energy Research Foundation Professorship in the Cockrell School of Engineering. An active member of the American Nuclear Society, he has been a recipient of the Glenn Murphy Award from the Nuclear and Radiological Division of the American Society of Engineering Education and the Holly Compton Award from the American Nuclear Society. His experimental research projects encompass fundamental nuclear physics, applied nuclear analytical techniques in environmental applications, and nuclear forensics.

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Anna Sanders:

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