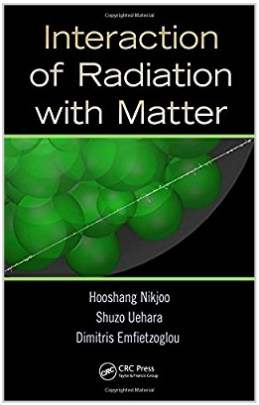

Interaction of Radiation with Matter

By Hooshang Nikjoo, Shuzo Uehara, Dimitris Emfietzoglou

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Interaction of Radiation with Matter focuses on the physics of the interactions of ionizing radiation in living matter and the Monte Carlo simulation of radiation tracks. Clearly progressing from an elementary level to the state of the art, the text explores the classical physics of track description as well as modern aspects based on condensed matter physics.

The first section of the book discusses the fundamentals of the radiation field. In the second section, the authors describe the cross sections for electrons and heavy ions?the most important information needed for simulating radiation track at the molecular level. The third section details the inelastic scattering and energy loss of charged particles in condensed media, particularly liquid water. The final section contains a large number of questions and problems to reinforce learning.

Designed for radiation interaction courses, this textbook is the ideal platform for teaching students in medical/health physics and nuclear engineering. It gives students a solid grounding in the physical understanding of radiation track structure in living matter, enabling them to pursue further work in radiological physics and radiation dosimetry.

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Interaction of Radiation with Matter By Hooshang Nikjoo, Shuzo Uehara, Dimitris Emfietzoglou Bibliography

- Sales Rank: #3534851 in Books
- Brand: Brand: Taylor Francis
- Published on: 2012-06-11
- Original language: English
- Number of items: 1
- Dimensions: 9.50" h x 6.25" w x .75" l, 1.40 pounds
- Binding: Hardcover
- 364 pages

Editorial Review

About the Author

Hooshang Nikjoo is a professor of radiation biophysics in the Department of Oncology-Pathology at the Karolinska Institutet. His research interests encompass computational approaches in molecular radiation biology, including Monte Carlo track structure methods, modeling DNA damage and repair, and a genome-based framework to estimate radiation risk in humans.

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Dimitris Emfietzoglou is an assistant professor in the Medical Physics Laboratory at the University of Ioannina Medical School. His research interests include the interaction of ionizing radiation with biomaterials and nanostructures and Monte Carlo particle transport simulation.

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