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Radiation Detection and Measurement Measurement and Detection of Radiation Radiation Detection Handbook of Drug Metabolism, Third Edition Radiation Detection And Measurement: Single Particle Detection And Measurement Atomic Radiation Detection and Measurement Physics and Engineering of Radiation Detection Radiation Detection and Measurement Physics and Engineering of Radiation Detection The Detection and measurement of infra-red radiation Principles of Nuclear Radiation Detection Solutions Manual to Accompany Radiation Detection and Measurement The Detection and Measurement of Infra-red Radiation Airborne Radioactive Discharges and Human Health Effects: An Introduction The Detection and Measurement of Infrared Radiation Radiation Detection and Measurement Semiconductor Radiation Detectors The Detection and Measurement of Infra-red Radiation Environmental Pollutants The Detection and Measurement of Infra-red Radiation The Design, Use and Implementation of Digital Radiation Detection and Measurement Equipment for the Purpose of Distance Instruction New Techniques for the Detection of Nuclear and Radioactive Agents Measurement, Detection, and Control of Environmental Pollutants Semiconductor Radiation Detectors Chemical and Biological Terrorism Measurement of Weak Radioactivity Active Interrogation in Nuclear Security Photodetection and Measurement Detection and measurement of ionizing radiation by electric means Radiation Detection for Nuclear Physics Compound Semiconductor Radiation Detectors The Detection and Measurement of Inflammable Gas and Vapour in the Air A Procedure for Detection and Measurement of Interfaces in Remotely Acquired Data Using a Digital Computer Detection and Measurement of Hazardous Gases Handbook of Radioactivity Analysis Ionizing Radiation Detectors for Medical Imaging An Introduction to the Physics of Nuclear Medicine Detection and Measurement of Gamma Rays in the Presence of a High Intensity Neutron Flux Handbook of Radioactivity Analysis

This book presents an overview of the physics of radiation detection and its applications. It covers the origins and properties of different kinds of ionizing radiation, their detection and measurement, and the procedures used to protect people and the environment from their potentially harmful effects. It details the experimental techniques and instrumentation used in different detection systems in a very practical way without sacrificing the physics content. It provides useful formulae and explains methodologies to solve problems related to radiation measurements. With abundance of worked-out examples and end-of-chapter problems, this book enables the reader to understand the underlying physical principles and their applications. Detailed discussions on different detection media, such as gases, liquids, liquefied gases, semiconductors, and scintillators make this book an excellent source of information for students as well as professionals working in related fields. Chapters on statistics, data analysis techniques, software for data analysis, and data acquisition systems provide the reader with necessary skills to design and build practical systems and perform data analysis. * Covers the modern techniques involved in detection and measurement of radiation and the underlying physical principles * Illustrates theoretical and practical details with an abundance of practical, worked-out examples * Provides practice problems at the end of each chapter "Radiation detection is key to experimental nuclear physics as well as underpinning a wide range of applications in nuclear decommissioning, homeland security and medical imaging. This book presents the state-of-the-art in radiation detection of light and heavy ions, beta particles, gamma rays and neutrons. The underpinning physics of different detector technologies is presented, and their performance is compared and contrasted. Detector technology likely to be encountered in contemporary international laboratories is also emphasized. There is a strong focus on experimental design and mapping detector technology to the needs of a particular measurement problem. This book will be invaluable to PhD students in experimental nuclear physics and nuclear technology, as well as undergraduate students encountering projects based on radiation detection for the first time. Part of IOP Series in Nuclear Spectroscopy and Nuclear Structure." -- Prové de l'editor. Radiation Detection: Concepts, Methods, and Devices provides a modern overview of radiation detection devices and radiation measurement methods. The book topics have been selected on the basis of the authors’ many years of experience designing radiation detectors and teaching radiation detection and measurement in a classroom environment. This book is designed to give the reader more than a glimpse at radiation detection devices and a few packaged equations. Rather it seeks to provide an understanding that allows the reader to choose the appropriate detection technology for a particular application, to design detectors, and to competently perform radiation measurements. The authors describe assumptions used to derive frequently encountered equations used in radiation detection and measurement, thereby providing insight when and when not to apply the many approaches used in different aspects of radiation detection. Detailed in many of the chapters are specific aspects of radiation detectors, including comprehensive reviews of the historical development and current state of each topic. Such a review necessarily entails citations to many of the important discoveries, providing a resource to find quickly additional and more detailed information. This book generally has five main themes: Physics and Electrostatics needed to Design Radiation Detectors Properties and Design of Common Radiation Detectors Description and Modeling of the Different Types of Radiation Detectors Radiation Measurements and Subsequent Analysis Introductory Electronics Used for Radiation Detectors Topics covered include atomic and nuclear physics, radiation interactions, sources of radiation, and background radiation. Detector operation is addressed with chapters on radiation counting statistics, radiation source and detector effects, electrostatics for signal generation, solid-state and semiconductor physics, background radiations, and radiation counting and spectroscopy. Detectors for gamma-rays, charged-particles, and neutrons are detailed in chapters on gas-filled, scintillator, semiconductor, thermoluminescence and optically stimulated luminescence, photographic film, and a variety of other detection devices. Handbook of Radioactivity Analysis: Radiation Physics and Detectors, Volume One, and Radioanalytical Applications, Volume Two, Fourth Edition, is an authoritative reference on the principles, practical techniques and procedures for the accurate measurement of radioactivity - everything from the very low levels encountered in the environment, to higher levels measured in radioisotope research, clinical laboratories, biological sciences, radionuclide standardization, nuclear medicine, nuclear power, and fuel cycle facilities, and in the implementation of nuclear forensic analysis and nuclear safeguards. It includes sample preparation techniques for all types of matrices found in the environment, including soil, water, air, plant matter and animal tissue, and surface swipes. Users will find a detailed discussion of our current understanding of the atomic nucleus, nuclear stability and decay, nuclear radiation, and the interaction of radiation with matter relating to the best methods for radionuclide detection and measurement. Spans two volumes, Radiation Physics and Detectors and Radioanalytical Applications Includes a much-expanded treatment of calculations required in the measurement of radionuclide decay, energy of decay, nuclear reactions, radiation attenuation, nuclear recoil, cosmic radiation, and synchrotron radiation Includes the latest advances in liquid and solid scintillation analysis, alpha- and gamma spectrometry, mass spectrometric analysis, gas ionization and nuclear track analysis, and neutron detection and measurement Covers high-sample-throughput microplate techniques and multi-detector assay methods This volume constitutes the state-of-the-art in active interrogation, widely recognized as indispensable methods for addressing current and future nuclear security needs. Written by a leading group of science and technology experts, this comprehensive reference presents technologies and systems in the context of the fundamental physics challenges and practical requirements. It compares the features, limitations, technologies, and impact of passive and active measurement techniques; describes radiation sources for active interrogation including electron and ion accelerators, intense lasers, and radioisotope-based sources; and it describes radiation detectors used for active interrogation. Entire chapters are devoted to data acquisition and processing systems, modeling and simulation, data interpretation and algorithms, and a survey of working active measurement systems. Active Interrogation in Nuclear Security is structured to appeal to a range of audiences, including graduate students, active researchers in the field, and policy analysts. The first book devoted entirely to active interrogation Presents a focused review of the relevant physics Surveys available technology

Analyzes scientific and technology trends Provides historical and policy context Igor Jovanovic is a Professor of Nuclear Engineering and Radiological Sciences at the University of Michigan and has previously also taught at Penn State University and Purdue University. He received his Ph.D. from University of California, Berkeley and worked as physicist at Lawrence Livermore National Laboratory. Dr. Jovanovic has made numerous contributions to the science and technology of radiation detection, as well as the radiation sources for use in active interrogation in nuclear security. He has taught numerous undergraduate and graduate courses in areas that include radiation detection, nuclear physics, and nuclear security. At University of Michigan Dr. Jovanovic is the director of Neutron Science Laboratory and is also associated with the Center for Ultrafast Optical Science. Anna Erickson is an Assistant Professor in the Nuclear and Radiological Engineering Program of the G.W. Woodruff School of Mechanical Engineering at Georgia Institute of Technology. Previously, she was a postdoctoral researcher in the Advanced Detectors Group at Lawrence Livermore National Laboratory. Dr. Erickson received her PhD from Massachusetts Institute of Technology with a focus on radiation detection for active interrogation applications. Her research interests focus on nuclear non-proliferation including antineutrino analysis and non-traditional detector design and characterization. She teaches courses in advanced experimental detection for reactor and nuclear nonproliferation applications, radiation dosimetry and fast reactor analysis. The second edition of a bestseller, this book presents the latest innovative research methods that help break new ground by applying patterns, reuse, and design science to research. The book relies on familiar patterns to provide the solid fundamentals of various research philosophies and techniques as touchstones that demonstrate how to innovate research methods. Filled with practical examples of applying patterns to IT research with an emphasis on reusing research activities to save time and money, this book describes design science research in relation to other information systems research paradigms such as positivist and interpretivist research. Digital Instrumentation and Detection is becoming the future of radiation detection and measurement. Computers are able to perform digitally what before would have taken an extensive array of analog equipment. The art of teaching radiation detection and measurement is following this same pattern of a shift from purely analog to digital, computer-based equipment. This thesis will involve designing software composed of digital equipment that will allow for distance students to learn the fundamentals of radiation detection and measurement. It will do so by using LabVIEW to create three detectors including the GM tube, Proportional Counter and Scintillator. The other associated instrumentation equipment that will be modeled includes a pre-amplifier, amplifier, SCA, MCA, and dual-counter/timer The end goal is that distance students can successfully learn the same fundamental principles of radiation detection as their on-campus counterparts. MAKE OPTICAL MEASUREMENTS WITH MAXIMUM ACCURACY AND MINIMUM COST The "opto-electronics revolution" has made the art and science of making sensitive, accurate, and inexpensive optical measurements must-know information for legions of electronic engineers and research students. And there’s no faster or easier way to master photodetection and measurement techniques than with this hands-on tutorial written by a teacher with experience enough to know the questions you would ask. A clear, easy-to-understand "rules-of-thumb" approach shows you how to make high-performance optical measurements by getting the fundamentals right, often with simple, inexpensive equipment commonly found in laboratories. It includes treatment of: * Photodetectors * Amplifiers * LED sources * Electronic modulation and demodulation * Interference avoidance * Data acquisition and basic DSP You’ll also gain a firm understanding of noise-reduction techniques and the essentials of building-in speed, sensitivity,and stability. If you want to learn the secret of making sound optical measurements without expensive equipment, this is the one resource you shouldn’t work without. The book describes the preparation of samples from a wide variety of matrices, assists the investigator or technician in the selection and use of appropriate radiation detector, and presents the latest state-of-the-art computerized and automated methods of analysis. The new Handbook of Radioactivity Analysis is suitable as a teaching text for university and professional training courses. Of interest to those working in a wide spectrum of disciplines, including: scientists, engineers, physicians, and technicians involved with the preparation, utilization, or disposal of radioactive materials and the measurement of radioactivity in the environment. § New, expanded and updated edition with three additional chapters § Provides modern procedures and guidelines for the analysis of natural and man-made environmental radionuclides § Includes up-to-date detailed sample preparation techniques for soil, air, plant, water, biological tissue, filter material, gels, surface swipes, etc. § Provides practical information for radioactivity monitoring, spectrometric analysis, and radiation dosimetry § Covers state-of-the-art high sample throughput microplate analysis techniques and multi-detector scintillation proximity analysis § Presents the latest methods of rapid electronic radionuclide imaging § Written by twenty-five experts from eight countries. Over 2,000 literature references The complexity and vulnerability of the human body has driven the development of a diverse range of diagnostic and therapeutic techniques in modern medicine. The Nuclear Medicine procedures of Positron Emission Tomography (PET), Single Photon Emission Computed Tomography (SPECT) and Radionuclide Therapy are well-established in clinical practice and are founded upon the principles of radiation physics. This book will offer an insight into the physics of nuclear medicine by explaining the principles of radioactivity, how radionuclides are produced and administered as radiopharmaceuticals to the body and how radiation can be detected and used to produce images for diagnosis. The treatment of diseases such as thyroid cancer, hyperthyroidism and lymphoma by radionuclide therapy will also be explored. Choice Recommended Title, July 2020 Bringing together material scattered across many disciplines, Semiconductor Radiation Detectors provides readers with a consolidated source of information on the properties of a wide range of semiconductors; their growth, characterization and the fabrication of radiation sensors with emphasis on the X- and gamma-ray regimes. It explores the promise and limitations of both the traditional and new generation of semiconductors and discusses where the future in semiconductor development and radiation detection may lie. The purpose of this book is two-fold; firstly to serve as a text book for those new to the field of semiconductors and radiation detection and measurement, and secondly as a reference book for established researchers working in related disciplines within physics and engineering. Features: The only comprehensive book covering this topic Fully up-to-date with new developments in the field Provides a wide-ranging source of further reference material 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. Although elemental semiconductors such as silicon and germanium are standard for energy dispersive spectroscopy in the laboratory, their use for an increasing range of applications is becoming marginalized by their physical limitations, namely the need for ancillary cooling, their modest stopping powers, and radiation intolerance. Compound semicond Ionizing Radiation Detectors for Medical Imaging contains ten technical chapters, half of which are devoted to radiology and the other half to nuclear medicine. The last chapter describes the detectors for radiotherapy and portal imaging. Each chapter addresses completely a specific application. The emphasis is always on detector fundamentals and detector properties. Where necessary, software and specific applications are described in depth. This book is intended for graduate and undergraduate students in physics and engineering who want to study medical imaging. In addition, scientists who are working in a specific sub-field of medical imaging can acquire from the book an up-to-date description of the state of the art in related sub-fields, within the scope of ionizing radiation detectors. Other scientists, as well as physicians, can use the book as a reference for medical imaging. Contents:Conventional RadiologyDetectors for Digital RadiographyDetectors for CT ScannersSpecial Applications in RadiologyAutoradiographySPECT and Planar Imaging in Nuclear MedicinePositron Emission TomographyNuclear Medicine: Special Applications in Functional ImagingSmall Animal ScannersDetectors for Radiotherapy Readership: Upper-level undergraduates, graduate students, researchers, academics and practitioners in nuclear medicine, medical imaging and radiology. Keywords:Radiation Detectors;Medical Imaging;Digital Radiology;CT Scanners;Synchroton Radiation;Autoradiagraphy;Nuclear Medicine;PET & SPECT;Small Animal Imaging;Detectors for Radiotherapy This book is an essential introduction to the basic principles of radiation protection and aerosol physics, including applications within international and UK law for the protection of the public against the dangers arising from ionising radiation.

The text also discusses the difficulties with the monitoring and the health detriment associated with problematic radionuclides. This book provides a summary of the state of science in teh field of single particle detection and measurement. The text delineates between those low performance detectors, capable of registering only a large number of particles and those complex, highly designed systems capable of detecting and measuring single interactions or events. The author describes the problems associated with detection, measurement and subsequent interpretation of such quantum processes. He also evolves the subject from its roots in nuclear and particle physics into latter day applications such as probes for investigation of materials and objects. The different nature and use of high-energy particles compared with photons is highlighted. Nuclear and radioactive agents are considerable concerns especially after the early 1990s and more attention has been focused on the radiation detection technologies. This book comprises the selected presentations of NATO Advanced Training Course held 26-30 May 2008 in Mugla, Turkey. The contributions represent a wide range of documents related to control, monitoring and measurement methods of nuclear / radioactive isotopes and agents for both fundamental and applied works dealing with their use for different purposes. This book presents environmental data from many locations of different countries and also contains the contributions in the detection/monitoring programs of some authors from CIS countries. The basic goal of this book is to deal with recent developments and applications of environmental monitoring and measurement techniques of environmental radionuclides and nuclear agents as well as the auxiliary techniques. The many recent examples contributed by authors will be useful in monitoring/ measurement studies of radioactive/nuclear agents in the present environment, and can help, not only in carrying out outdoor and laboratory experiments, but also in protection of possible sources of radionuclides and nuclear agents. Especially the contributions of experts and specialists involved in this book assured the highest level of knowledge in the field of techniques for the detection of radioactive and nuclear agents. This book is intended for scientists engaged in the measurement of weak alpha, beta, and gamma active samples; in health physics, environmental control, nuclear geophysics, tracer work, radiocarbon dating etc. It describes the underlying principles of radiation measurement and the detectors used. It also covers the sources of background, analyzes their effect on the detector and discusses economic ways to reduce the background. The most important types of low-level counting systems and the measurement of some of the more important radioisotopes are described here. In cases where more than one type can be used, the selection of the most suitable system is shown. Contents:Low-Level CountingHistoryAtomic Nuclei and Binding EnergyRadioactivityInteraction of Radiation with MatterOur Natural Radioactive EnvironmentCosmic RaysRadiation DetectorsBackground: Sources and ComponentsMeasurement of Contamination Background ReductionGermanium SpectrometersGas Proportional Counter SystemsLiquid Scintillation Counting SystemsOther Low-Level Counting SystemsNon-Radiometric Methods and Neutron Activation AnalysisImportant Applications of Low-Level CountingStatisticsReferences: Physical Constants and Conversion FactorsPeriodic Table of Elements Readership: Environmental scientists, nuclear physicists and geophysicists. keywords:Weak;Low-Level;Radioactivity;Environment;Natural;Tritium;Radon;Radiocarbon;Background;Contamination Starting from basic principles, this book describes the rapidly growing field of modern semiconductor detectors used for energy and position measurement radiation. The author, whose own contributions to these developments have been significant, explains the working principles of semiconductor radiation detectors in an intuitive way. Broad coverage is also given to electronic signal readout and to the subject of radiation damage. Physics and Engineering of Radiation Detection presents an overview of the physics of radiation detection and its applications. It covers the origins and properties of different kinds of ionizing radiation, their detection and measurement, and the procedures used to protect people and the environment from their potentially harmful effects. The second edition is fully revised and provides the latest developments in detector technology and analyses software. Also, more material related to measurements in particle physics and a complete solutions manual have been added. Discusses the experimental techniques and instrumentation used in different detection systems in a very practical way without sacrificing the physics content Provides useful formulae and explains methodologies to solve problems related to radiation measurements Contains many worked-out examples and end-of-chapter problems Detailed discussions on different detection media, such as gases, liquids, liquefied gases, semiconductors, and scintillators Chapters on statistics, data analysis techniques, software for data analysis, and data acquisition systems A new edition of the most comprehensive text/reference available on the methods and instrumentation used in the detection of ionizing radiation. Updated to reflect advances since the first edition came out in 1979. Retains the general organization of the first edition--all topics of importance are covered in sufficient detail to lead the reader from basic principles to examples of modern applications. Covers modern engineering practice; provides useful design information; and contains an up-to-date and thorough review of the literature. This book is intended for senior undergraduate and beginning graduate students in physics, nuclear engineering, health physics and nuclear medicine, and for specialized training courses for radiation protection personnel and environmental safety engineers.To keep the size of the book manageable, material has been selected to stress those detectors that are in widespread use. Attempts have also been made to emphasize alternatives available in approaching various measurement problems and to present the criteria by which a choice among these alternatives may be made. The threat of domestic terrorism today looms larger than ever. Bombings at the World Trade Center and Oklahoma City's Federal Building, as well as nerve gas attacks in Japan, have made it tragically obvious that American civilians must be ready for terrorist attacks. What do we need to know to help emergency and medical personnel prepare for these attacks? Chemical and Biological Terrorism identifies the R&D efforts needed to implement recommendations in key areas: pre-incident intelligence, detection and identification of chemical and biological agents, protective clothing and equipment, early recognition that a population has been covertly exposed to a pathogen, mass casualty decontamination and triage, use of vaccines and pharmaceuticals, and the psychological effects of terror. Specific objectives for computer software development are also identified. The book addresses the differences between a biological and chemical attack, the distinct challenges to the military and civilian medical communities, and other broader issues. This book will be of critical interest to anyone involved in civilian preparedness for terrorist attack: planners, administrators, responders, medical professionals, public health and emergency personnel, and technology designers and engineers. The principal emphasis of the Department of Radiation Biology and Biophysics is on biological problems. Techniques for measuring are considered very necessary but the development of them is usual ly left to someone else. Therefore it is a little unusual for the department to sponsor a conference which is devoted mostly to methodology. Environmental Pollution is a very popular topic now, and one notices that there are a number of scientific conferences devoted to the topic. Furthermore, part of every conference is devoted to measurements of pollutants. So the question becomes one of what should be different about our conference. To start with there are two unique features here: The first is the limited attendance which should provide more meaningful discussion; the second is the availability to the world of all the information in book form after the conference. We gave considerable thought to the contents of the conference which would take advantage of the unique features. Therefore, we decided to look to the future and present material here that is not in routine use. The search for pollutants has just begun, and their presence cannot be established without some means of detection. Many substances are not known to be toxic be cause no one has studied them. The necessary information can only be obtained if techniques for detection and measurement are avail able.

- Radiation Detection And Measurement
- Measurement And Detection Of Radiation
- Radiation Detection
- Handbook Of Drug Metabolism Third Edition
- Radiation Detection And Measurement
- Single Particle Detection And Measurement

- Atomic Radiation Detection And Measurement
- Physics And Engineering Of Radiation Detection
- Radiation Detection And Measurement
- Physics And Engineering Of Radiation Detection
- The Detection And Measurement Of Infra red Radiation
- Principles Of Nuclear Radiation Detection
- Solutions Manual To Accompany Radiation Detection And Measurement
- The Detection And Measurement Of Infra red Radiation
- Airborne Radioactive Discharges And Human Health Effects An Introduction
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- Radiation Detection And Measurement
- Semiconductor Radiation Detectors
- The Detection And Measurement Of Infra red Radiation
- Environmental Pollutants
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