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Industrial X-Ray Computed Tomography - Simone Carmignato 2017-10-18
X-ray computed tomography has been used for several decades as a tool for measuring the three-dimensional geometry of the internal organs in medicine. However, in recent years, we have seen a move in manufacturing industries for the use of X-ray computed tomography; first to give qualitative information about the internal geometry and defects in a component, and more recently, as a fully-quantitative technique for dimensional and materials analysis. This trend is primarily due to the ability of X-ray computed tomography to give a high-density and multi-scale representation of both the external and internal geometry of a component, in a non-destructive, non-contact and relatively fast way. But, due to the complexity of X-ray computed tomography, there are remaining metrological issues to solve and the specification standards are still under development. This book will act as a one-stop-shop resource for students and users of X-ray computed tomography in both academia and industry. It presents the fundamental principles of the technique, detailed descriptions of the various components (hardware and software), current developments in calibration and performance verification and a wealth of example applications. The book will also highlight where there is still work to do, in the perspective that X-ray computed tomography will be an essential part of Industry 4.0.

Fundamentals of X-ray - Naval Medical School (U.S.) 1944

Technology of Integrated Circuits - D. Widmann 2000-07-06

Strongly involved with SIEMENS Corp. in the tremendous recent developments of process technologies for IC fabrication the authors comprehensively record their authoritative knowledge and practical experience. New materials , modern planar technology, process designs for CMOS, Bipolar, BICMOS and smart-power technologies, self-adjusting doping techniques are just a few of the highlights. With its strong application-orientation this is a need-to-have book for professionals in semiconductor industries. Senior students in electrical engineering and physics can use it as a textbook because of the systematic treatment of the subjects. With regard to their later careers as industrial engineers they will particularly appreciate the deep insight into the actual methods and problems of IC manufacturing.

Imaging Physics Case Review E-Book - R. Brad Abrahams 2019-01-01
Master the critical physics content you need to know with this new title in the popular Case Review series. Imaging Physics Case Review offers a highly illustrated, case-based preparation for board review to help residents and recertifying radiologists succeed on exams and demonstrate a clinical understanding of physics, patient safety, and

improvement of imaging accuracy and interpretation. Presents 150 high-yield case studies organized by level of difficulty, with multiple-choice questions, answers, and rationales that mimic the format of certification exams. Uses short, easily digestible chapters and high-quality illustrations for efficient, effective learning and exam preparation. Discusses current advances in all modalities, ensuring that your study is up-to-date and clinically useful. Covers today's key physics topics including radiation safety and methods to prevent patient harm; how to reduce artifacts; basics of radiation doses including dose reduction strategies; cardiac CT physics; advanced ultrasound techniques; and how to optimize image quality using physics principles. Enhanced eBook version included with purchase, which allows you to access all of the text, figures, and references from the book on a variety of devices

Technical Fundamentals of Radiology and CT - Guillermo Avendaño Cervantes 2016

Technical Fundamentals of Radiology and CT is intended to cover all issues related to radiology and computed tomography, from the technological point of view, both for understanding the operation of all devices involved and for their maintenance. It is intended for students and a wide range of professionals working in various fields of radiology, those who take images and know little about the workings of the devices, and professionals who install, maintain and solve technological problems of all radiological systems used in health institutions.

Diagnostic Radiology Physics - International Atomic Energy Agency 2014

This publication is aimed at students and teachers involved in programmes that train medical physicists for work in diagnostic radiology. It provides a comprehensive overview of the basic medical physics knowledge required in the form of a syllabus for the practice of modern diagnostic radiology. This makes it particularly useful for graduate students and residents in medical physics programmes. The material presented in the publication has been endorsed by the major international organizations and is the foundation for academic and clinical courses in both diagnostic radiology physics and in emerging areas such as imaging

in radiotherapy.

X-Ray and Neutron Diffraction in Nonideal Crystals - Mikhail A. Krivoglaz 2012-12-06

Mikhail Alexandrovich Krivoglaz died unexpectedly when he was preparing the English edition of his two-volume monograph on diffraction and diffuse scattering of X-rays and neutrons in imperfect crystals. His death was a heavy blow to all who knew him, who had worked with him and to the world science community as a whole. The application of the diffraction techniques for the study of imperfections of crystal structures was the major field of Krivoglaz' work throughout his career in science. He started working in the field in the mid-fifties and since then made fundamental contributions to the theory of real crystals. His results have largely determined the current level of knowledge in this field for more than thirty years. Until the very last days of his life, Krivoglaz continued active studies in the physics of diffraction effects in real crystals. His interest in the theory aided in the explanation of the rapidly advancing experimental studies. The milestones marking important stages of his work were the first monograph on the theory of X-ray and neutron scattering in real crystals which was published in Russian in 1967 (a revised English edition in 1969), and the two volume monograph published in Russian in 1983-84 (this edition is the revised translation of the latter).

X-Ray Spectrometry - Kouichi Tsuji 2005-08-19

X-Ray Spectrometry: Recent Technological Advances covers the latest developments and areas of research in the methodological and instrumental aspects of x-ray spectrometry. Includes the most advanced and high-tech aspects of the chemical analysis techniques based on x-rays Introduces new types of X-ray optics and X-ray detectors, covering history, principles, characteristics and future trends Written by internationally recognized scientists, all of whom are eminent specialists in each of the sub-fields Sections include: X-Ray Sources, X-Ray Optics, X-Ray Detectors, Special Configurations, New Computerization Methods, New Applications This valuable book will assist all analytical chemists and other users of x-ray spectrometry to fully exploit the capabilities of this set of powerful analytical tools and to further expand applications in such

fields as material and environmental sciences, medicine, toxicology, forensics, archaeometry and many others.

Farr's Physics for Medical Imaging - Penelope J. Allisy-Roberts 2007-11-14

This title is directed primarily towards health care professionals outside of the United States. The new edition has been fully updated to reflect the latest advances in technology and legislation and the needs of today's radiology trainees. Invaluable reading, particularly for those sitting the primary and final examinations of the Royal College of Radiology, UK, the book will also be of value to radiographers and personnel interested in medical imaging. The concise text is also accompanied by clear line drawings and sample images to illustrate the principles discussed. Closely matches needs of FRCR examination candidates. Updated to reflect changes to FRCR examination. More medically orientated. Covers new legislation concerning radiological safety etc. 'Must-know' summaries at end of each chapter. Completely new design.

Airport Passenger Screening Using Backscatter X-Ray Machines - National Academies of Sciences, Engineering, and Medicine 2016-01-10

Passenger screening at commercial airports in the United States has gone through significant changes since the events of September 11, 2001. In response to increased concern over terrorist attacks on aircrafts, the Transportation Security Administration (TSA) has deployed security systems of advanced imaging technology (AIT) to screen passengers at airports. To date (December 2014), TSA has deployed AITs in U.S. airports of two different technologies that use different types of radiation to detect threats: millimeter wave and X-ray backscatter AIT systems. X-ray backscatter AITs were deployed in U.S. airports in 2008 and subsequently removed from all airports by June 2013 due to privacy concerns. TSA is looking to deploy a second-generation X-ray backscatter AIT equipped with privacy software to eliminate production of an image of the person being screened in order to alleviate these concerns. This report reviews previous studies as well as current processes used by the Department of Homeland Security and equipment manufacturers to estimate radiation exposures resulting from backscatter X-ray advanced imaging technology system use in screening air travelers. Airport Passenger Screening Using

Backscatter X-Ray Machines examines whether exposures comply with applicable health and safety standards for public and occupational exposures to ionizing radiation and whether system design, operating procedures, and maintenance procedures are appropriate to prevent over exposures of travelers and operators to ionizing radiation. This study aims to address concerns about exposure to radiation from X-ray backscatter AITs raised by Congress, individuals within the scientific community, and others.

Quantitative X-Ray Spectrometry, Second Edition, - Ron Jenkins 1995-04-26

This work covers important aspects of X-ray spectrometry, from basic principles to the selection of instrument parameters and sample preparation. This edition explicates the use of combined X-ray fluorescence and X-ray diffraction data, and features new applications in environmental studies, forensic science, archeometry and the analysis of metals and alloys, minerals and ore, ceramic materials, catalysts and trace metals.; This work is intended for spectroscopists, analytical chemists, materials scientists, experimental physicists, mineralogists, biologists, geologists and graduate-level students in these disciplines.

Modern Diagnostic X-Ray Sources - Rolf Behling 2021-04-19

Now fully updated, the second edition of Modern Diagnostic X-Ray Sources: Technology, Manufacturing, Reliability gives an up-to-date summary of X-ray source technology and design for applications in modern diagnostic medical imaging. It lays a sound groundwork for education and advanced training in the physics of X-ray production, X-ray interactions with matter, and imaging modalities and assesses their prospects. The book begins with a comprehensive and easy-to-read historical overview of X-ray tube and generator development, including key achievements leading up to the current technological and economic state of the field. The book covers the physics of X-ray generation, including the process of constructing X-ray source devices. The stand-alone chapters can be read in order or in selections. They take you inside diagnostic X-ray tubes, illustrating their design, functions, metrics for validation, and interfaces. The detailed descriptions enable objective

comparison and benchmarking. This detailed presentation of X-ray tube creation and functions enables you to understand how to optimize tube efficiency, particularly with consideration for economics and environmental care. It also simplifies faultfinding. Along with covering the past and current state of the field, the book assesses the future regarding developing new X-ray sources that can enhance performance and yield greater benefits to the scientific community and to the public. After heading international R&D, marketing and advanced development for X-ray sources with Philips, and working in the X-ray industry for more than four decades, Rolf Behling retired in 2020 and is now the owner of the consulting firm XtraininX, Germany. He holds numerous patents and is continuously publishing, consulting and training.

Industrial X-ray Interpretation - Justin G. Schneeman 1968
TEXTBOOK. PRACTICAL ORIENTATION. CONTENTS INCLUDE INTRODUCTION - HISTORY, INTERPRETATION-SCIENCE, THE RADIOGRAPH, THE X-RAY MACHINE, RADIOISOTOPES, X-RAY TUBES, X-RAY SYSTEMS, X-RAY POSITIONING, X-RAY ABSORPTION, SECONDARY RADIATION, INTENSIFYING SCREENS, FILM PROCESSING, PERFECT RADIOGRAPHS, X-RAY ILLUMINATION, CASTING INTERPRETATION, HONEYCOMB INTERPRETATION, BRAZING AND SOLDERING, WELD INTERPRETATION, ELECTRONIC ITEMS, SPECIALTY ITEMS, FILMLESS INTERPRETATION, MOTION RADIOGRAPHY, 3-D RADIOGRAPHY, XERORADIOGRAPHY, IMAGE QUALITY INDICATORS, RADIATION AND HIGH VOLTAGE SAFETY, X-RAY FILM TYPES AND SIZES, INTERPRETATION-A PROFESSION, THE X-RAY REPORT. INDEX. NO BIBLIOGRAPHY. ONE REFERENCE.

X-Ray Repair - Joseph J. Panichello 2017

In the 20 years since the publication of the first edition, the field of radiology has advanced in ways that would have been difficult to predict. The most notable change relates to the way images are recorded and stored. Film and film processing, which had been used in the field since the very beginning, are becoming a thing of the past. Radiography has progressed dramatically to using digital technology, and that is the focus of this new edition. A goal of this text has always been to prepare the student who wishes to enter the x-ray servicing profession. This third

edition has been completely rewritten and updated to focus on equipment currently in use and to address the latest in digital imaging. In addition, with new illustrations and a revised chapter order, the book is more approachable to students. The book includes chapters on the history and development of radiographic equipment; types of equipment found in the general radiographic room; fundamentals of radiography; safety practices in servicing; installation processes; preventive maintenance; image quality; troubleshooting and repair; theory, service, maintenance, and calibration of tomographic equipment; and the servicing, electronic calibrating, and troubleshooting of mammography units. In addition, there is expanded discussion on mobile x-ray units, paired with digital receptors, a growing trend in x-ray services. The book is further enhanced with many illustrations, including some new to this edition. The text continues to serve as a unique and timely universal manual for x-ray service and biomedical engineers and students as well as a helpful resource for radiologists.

X-Ray Imaging - Harry E. Martz 2016-10-26

While books on the medical applications of x-ray imaging exist, there is not one currently available that focuses on industrial applications. Full of color images that show clear spectrometry and rich with applications, X-Ray Imaging fills the need for a comprehensive work on modern industrial x-ray imaging. It reviews the fundamental science of x-ray imaging and addresses equipment and system configuration. Useful to a broad range of radiation imaging practitioners, the book looks at the rapid development and deployment of digital x-ray imaging system.

CT at a Glance - Euclid Seeram 2017-11-10

CT at a Glance gets readers quickly up to speed with the core knowledge and competencies required for computed tomography (CT) scanning, as established by the major radiography organizations around the world, including the ASRT and the CAMRT. This brand new title describes the basic science behind CT with an emphasis on the theory that is essential for practice. Featuring an abundance of illustrations, succinct, straightforward explanations and clear, step-by-step guidance, it includes the fundamental physics, technical principles, and imaging strategies and

procedures involved in CT scanning. Over the course of twenty four, concise modular chapters, CT at a Glance covers all the bases for entry-to-practice students, including: The basic physics underlying CT scanning State-of-the-art multi-slice technologies Data acquisition strategies Equipment components—their functions and applications Image reconstruction and image quality control CT dose and dose optimization procedures Quality control fundamentals CT at a Glance is an indispensable learning resource for students in medical imaging technology courses, including those covering radiography, nuclear medicine, and radiation therapy, as well as for biomedical engineering technology students.

The Essential Physics of Medical Imaging - Jerrold T. Bushberg 2002
Developed from the authors' highly successful annual imaging physics review course, this new Second Edition gives readers a clear, fundamental understanding of the theory and applications of physics in radiology, nuclear medicine, and radiobiology. The Essential Physics of Medical Imaging, Second Edition provides key coverage of the clinical implications of technical principles--making this book great for board review. Highlights of this new edition include completely updated and expanded chapters and more than 960 illustrations. Major sections cover basic concepts, diagnostic radiology, nuclear medicine, and radiation protection, dosimetry, and biology. A Brandon-Hill recommended title.

Choosing Not Choosing - Sharon Cameron 1992
Although Emily Dickinson copied and bound her poems into manuscript notebooks, in the century since her death her poems have been read as single lyrics with little or no regard for the context she created for them in her fascicles. Choosing Not Choosing is the first book-length consideration of the poems in their manuscript context. Sharon Cameron demonstrates that to read the poems with attention to their placement in the fascicles is to observe scenes and subjects unfolding between and among poems rather than to think of them as isolated riddles, enigmatic in both syntax and reference. Thus Choosing Not Choosing illustrates that the contextual sense of Dickinson is not the canonical sense of Dickinson. Considering the poems in the context of the fascicles, Cameron argues that an

essential refusal of choice pervades all aspects of Dickinson's poetry. Because Dickinson never chose whether she wanted her poems read as single lyrics or in sequence (nor is it clear where any fascicle text ends, or even how, in context, a poem is bounded), "not choosing" is a textual issue; it is also a formal issue because Dickinson refused to chose among poetic variants; it is a thematic issue; and, finally, it is a philosophical one, since what is produced by "not choosing" is a radical indifference to difference. Extending the readings of Dickinson offered in her earlier book Lyric Time, Cameron continues to enlarge our understanding of the work of this singular American poet.

High Power Coherent X-Ray Source and Search for X-Ray Laser - Kamalaksha das Gupta 1976

Non-divergent 'hot spot' from single crystals bombarded with electron beam from Febetron and Van de Graaff and sealed-off x-ray tube reveals discrete frequencies in bremsstrahlung. Stimulated Kossel line and radiative Auger Raman process have been observed in germanium crystal. Conical target x-ray tube bombarded by electrons at grazing angle give high contrast radiograph of materials and instruments. The observed coherent radiation has been profitably used for surface studies and could be used for development of x-ray holography. (Author).

Digital Mammography - Ulrich Bick 2010-03-11

Digital Radiography has been firmly established in diagnostic radiology during the last decade. Because of the special requirements of high contrast and spatial resolution needed for roentgen mammography, it took some more time to develop digital mammography as a routine radiological tool. Recent technological progress in detector and screen design as well as increased experience with computer applications for image processing have now enabled Digital Mammography to become a mature modality that opens new perspectives for the diagnosis of breast diseases. The editors of this timely new volume Prof. Dr. U. Bick and Dr. F. Diekmann, both well-known international leaders in breast imaging, have for many years been very active in the frontiers of theoretical and translational clinical research, needed to bring digital mammography finally into the sphere of daily clinical radiology. I am very much indebted

to the editors as well as to the other internationally recognized experts in the field for their outstanding state of the art contributions to this volume. It is indeed an excellent handbook that covers in depth all aspects of Digital Mammography and thus further enriches our book series Medical Radiology. The highly informative text as well as the numerous well-chosen superb illustrations will enable certified radiologists as well as radiologists in training to deepen their knowledge in modern breast imaging.

Introduction to Medical Physics - Stephen Keevil 2022-01-18

This textbook provides an accessible introduction to the basic principles of medical physics, the applications of medical physics equipment, and the role of a medical physicist in healthcare. Introduction to Medical Physics is designed to support undergraduate and graduate students taking their first modules on a medical physics course, or as a dedicated book for specific modules such as medical imaging and radiotherapy. It is ideally suited for new teaching schemes such as Modernising Scientific Careers and will be invaluable for all medical physics students worldwide. Key features: Written by an experienced and senior team of medical physicists from highly respected institutions The first book written specifically to introduce medical physics to undergraduate and graduate physics students Provides worked examples relevant to actual clinical situations

Mathematics and Physics of Emerging Biomedical Imaging - Committee on the Mathematics and Physics of Emerging Dynamic Biomedical Imaging 1996-03-13

This cross-disciplinary book documents the key research challenges in the mathematical sciences and physics that could enable the economical development of novel biomedical imaging devices. It is hoped that the infusion of new insights from mathematical scientists and physicists will accelerate progress in imaging. Incorporating input from dozens of biomedical researchers who described what they perceived as key open problems of imaging that are amenable to attack by mathematical scientists and physicists, this book introduces the frontiers of biomedical imaging, especially the imaging of dynamic physiological functions, to the educated nonspecialist. Ten imaging modalities are covered, from the

well-established (e.g., CAT scanning, MRI) to the more speculative (e.g., electrical and magnetic source imaging). For each modality, mathematics and physics research challenges are identified and a short list of suggested reading offered. Two additional chapters offer visions of the next generation of surgical and interventional techniques and of image processing. A final chapter provides an overview of mathematical issues that cut across the various modalities.

Introduction to X-Ray Spectrometric Analysis - Eugene P. Bertin 2013-06-29

X-ray fluorescence spectrometry has been an established, widely practiced method of instrumental chemical analysis for about 30 years. However, although many colleges and universities offer full-semester courses in optical spectrometric methods of instrumental analysis and in x-ray diffraction, very few offer full courses in x-ray spectrometric analysis. Those courses that are given are at the graduate level. Consequently, proficiency in this method must still be acquired by: self-instruction; on-the-job training and experience; "workshops" held by the x-ray instrument manufacturers; the one- or two-week summer courses offered by a few universities; and certain university courses in analytical and clinical chemistry, metallurgy, mineralogy, geology, ceramics, etc. that devote a small portion of their time to applications of x-ray spectrometry to those respective disciplines. Moreover, with all due respect to the books on x-ray spectrometric analysis now in print, in my opinion none is really suitable as a text or manual for beginners in the discipline. In 1968, when I undertook the writing of the first edition of my previous book, *Principles and Practice of X-Ray Spectrometric Analysis*,* my objective was to provide a student text. However, when all the material was compiled, I decided to provide a more comprehensive book, which was also lacking at that time. Although that book explains principles, instrumentation, and methods at the beginner's level, this material is distributed throughout a mass of detail and more advanced material.

Medical Imaging Systems - Andreas Maier 2018-08-02

This open access book gives a complete and comprehensive introduction

to the fields of medical imaging systems, as designed for a broad range of applications. The authors of the book first explain the foundations of system theory and image processing, before highlighting several modalities in a dedicated chapter. The initial focus is on modalities that are closely related to traditional camera systems such as endoscopy and microscopy. This is followed by more complex image formation processes: magnetic resonance imaging, X-ray projection imaging, computed tomography, X-ray phase-contrast imaging, nuclear imaging, ultrasound, and optical coherence tomography.

MDCT Physics - Mahadevappa Mahesh 2009

Written by the chief physicist at Johns Hopkins University Hospital, this easy-to-read short textbook explains the physics behind multi-detector CT technology, particularly newer, more complex technology. The focus is on principles of physics, effects of scan parameters on image quality, and optimum radiation dosage. The book includes numerous key points summaries and questions to assist in exam preparation.

X-Ray Equipment Maintenance and Repairs Workbook for Radiographers and Radiological Technologists - Ian R. McClelland 2004

The X-ray equipment maintenance and repairs workbook is intended to help and guide staff working with, and responsible for, radiographic equipment and installations in remote institutions where the necessary technical support is not available, to perform routine maintenance and minor repairs of equipment to avoid break downs. The book can be used for self study and as a checklist for routine maintenance procedures.

FRCR Physics Notes - Christopher Clarke 2020-11-13

Comprehensive medical imaging physics notes aimed at those sitting the first FRCR physics exam in the UK and covering the scope of the Royal College of Radiologists syllabus. Written by Radiologists, the notes are concise and clearly organised with 100's of beautiful diagrams to aid understanding. The notes cover all of radiology physics, including basic science, x-ray imaging, CT, ultrasound, MRI, molecular imaging, and radiation dosimetry, protection and legislation. Although aimed at UK radiology trainees, it is also suitable for international residents taking similar examinations, postgraduate medical physics students and

radiographers. The notes provide an excellent overview for anyone interested in the physics of radiology or just refreshing their knowledge. This third edition includes updates to reflect new legislation and many new illustrations, added sections, and removal of content no longer relevant to the FRCR physics exam. This edition has gone through strict critique and evaluation by physicists and other specialists to provide an accurate, understandable and up-to-date resource. The book summarises and pulls together content from the FRCR Physics Notes at Radiology Cafe and delivers it as a paperback or eBook for you to keep and read anytime. There are 7 main chapters, which are further subdivided into 60 sub-chapters so topics are easy to find. There is a comprehensive appendix and index at the back of the book.

The Essential Physics of Medical Imaging - Jerold T. Bushberg 2020-11-24

Widely regarded as the cornerstone text in the field, the successful series of editions continues to follow the tradition of a clear and comprehensive presentation of the physical principles and operational aspects of medical imaging. The Essential Physics of Medical Imaging, 4th Edition, is a coherent and thorough compendium of the fundamental principles of the physics, radiation protection, and radiation biology that underlie the practice and profession of medical imaging. Distinguished scientists and educators from the University of California, Davis, provide up-to-date, readable information on the production, characteristics, and interactions of non-ionizing and ionizing radiation, magnetic fields and ultrasound used in medical imaging and the imaging modalities in which they are used, including radiography, mammography, fluoroscopy, computed tomography, magnetic resonance, ultrasound, and nuclear medicine. This vibrant, full-color text is enhanced by more than 1,000 images, charts, and graphs, including hundreds of new illustrations. This text is a must-have resource for medical imaging professionals, radiology residents who are preparing for Core Exams, and teachers and students in medical physics and biomedical engineering.

Wilhelm Conrad Röntgen - Uwe Busch 2021-10-09

It was one of the great moments of humanity when Wilhelm Conrad Röntgen (1845- 1923) discovered a new kind of radiation on 8 November

1895. He himself modestly called them “X-rays”. Röntgen’s name and his rays became world famous. On 10 December 1901, Röntgen received the first Nobel Prize in Physics. X-rays have lost none of their appeal since then. They still permeate all areas of science, technology and medicine and accompany us in our everyday lives. However, Röntgen’s scientific work cannot be reduced to this one great discovery alone. He was an excellent natural scientist, and his spirit of research is still an example for many scientists today. Röntgen’s very special interest in precision physics is also more topical than ever. This carefully curated volume offers a multifaceted view of an outstanding natural scientist and provides insights into his personal legacy.

Calculating X-ray Tube Spectra - Gavin Poludniowski 2022-05-09

Calculating x-ray tube spectra provides a comprehensive review of the modelling of x-ray tube emissions, with a focus on medical imaging and radiotherapy applications. It begins by covering the relevant background, before discussing modelling approaches, including both analytical formulations and Monte Carlo simulation. Historical context is provided, based on the past century of literature, as well as a summary of recent developments and insights. The book finishes with example applications for spectrum models, including beam quality prediction and the calculation of dosimetric and image-quality metrics. This book will be a valuable resource for postgraduate and advanced undergraduate students studying medical radiation physics, in addition to those in teaching, research, industry and healthcare settings whose work involves x-ray tubes. Key Features: Covers simple modelling approaches as well as full Monte Carlo simulation of x-ray tubes Bremsstrahlung and characteristic contributions to the spectrum are discussed in detail Learning is supported by free open-source software and an online repository of code.

Christensen's Physics of Diagnostic Radiology - Thomas S. Curry 1990

The Fourth Edition of this text provides a clear understanding of the physics principles essential to getting maximum diagnostic value from the full range of current and emerging imaging technologies. Updated material added in areas such as x-ray generators (solid-state devices), xerography (liquid toner), CT scanners (fast-imaging technology) and

ultrasound (color Doppler).

Applied X-rays - George Lindenberg Clark 1940

Part I: General physics and applications of x-radiation: Before and after the discovery by roentgen. X-ray tubes. High-tension equipment. The measurement of intensity (dosage). The measurement of quality (Wave length). X-ray spectra and atomic structure. Chemical analysis from x-ray spectra. The absorption and scattering of x-rays. Radiography. X-ray photochemistry. The biological effects of x-radiation. Part II: The x-ray analysis of the ultimate structures of materials: Crystallography and x-ray diffraction. The experimental x-ray methods of crystal analysis. The interpretation of diffraction patterns in terms of ultimate structure. The results of crystal analysis: elements and inorganic compounds. Crystal chemistry: fundamental generalizations from experimental data. The silicates. Minerals, soils, ceramics, cements. Alloys. The crystalline and molecular structures of organic compounds. The structure of glasses, liquids, and other colloidal and amorphous materials. The interpretation of diffraction patterns in terms of grain size, orientation, internal strain, and mechanical deformation. Practical applications of x-ray diffraction to problems of the metallurgical industry. Polymers-synthetic and natural materials with giant molecules.

Calculating X-ray Tube Spectra - Gavin Poludniowski 2022-05-06

Calculating x-ray tube spectra provides a comprehensive review of the modelling of x-ray tube emissions, with a focus on medical imaging and radiotherapy applications. It begins by covering the relevant background, before discussing modelling approaches, including both analytical formulations and Monte Carlo simulation. Historical context is provided, based on the past century of literature, as well as a summary of recent developments and insights. The book finishes with example applications for spectrum models, including beam quality prediction and the calculation of dosimetric and image-quality metrics. This book will be a valuable resource for postgraduate and advanced undergraduate students studying medical radiation physics, in addition to those in teaching, research, industry and healthcare settings whose work involves x-ray tubes. Key Features: Covers simple modelling approaches as well as full

Monte Carlo simulation of x-ray tubes Bremsstrahlung and characteristic contributions to the spectrum are discussed in detail Learning is supported by free open-source software and an online repository of code. Protocols for the Radiation Safety Surveys of Diagnostic Radiological Equipment - 1988

A Practical Approach to Modern X-ray Equipment - Thomas T. Thompson 1978

Review of Radiologic Physics - Walter Huda 2016-01-20

Now revised to reflect the new, clinically-focused certification exams, Review of Radiological Physics, Fourth Edition, offers a complete review for radiology residents and radiologic technologists preparing for certification. . This new edition covers x-ray production and interactions, projection and tomographic imaging, image quality, radiobiology, radiation protection, nuclear medicine, ultrasound, and magnetic resonance – all of the important physics information you need to understand the factors that improve or degrade image quality. Each chapter is followed by 20 questions for immediate self-assessment, and two end-of-book practice exams, each with 100 additional questions, offer a comprehensive review of the full range of topics.

Encyclopaedia of Medical Physics - Slavik Tabakov 2020-07-16

Co-published by the European Medical Imaging Technology e-Encyclopaedia for Lifelong Learning (EMITEL) consortium and supported by the International Organization for Medical Physics (IOMP), Encyclopaedia of Medical Physics contains nearly 2,800 cross-referenced entries relating to medical physics and associated technologies. Split into two convenient

Portable Spectroscopy and Spectrometry, Applications - Richard A. Crocombe 2021-04-26

The most comprehensive resource available on the many applications of portable spectrometers, including material not found in any other published work Portable Spectroscopy and Spectrometry: Volume Two is an authoritative and up-to-date compendium of the diverse applications

for portable spectrometers across numerous disciplines. Whereas Volume One focuses on the specific technologies of the portable spectrometers themselves, Volume Two explores the use of portable instruments in wide range of fields, including pharmaceutical development, clinical research, food analysis, forensic science, geology, astrobiology, cultural heritage and archaeology. Volume Two features contributions by a multidisciplinary team of experts with hands-on experience using portable instruments in their respective areas of expertise. Organized both by instrumentation type and by scientific or technical discipline, 21 detailed chapters cover various applications of portable ion mobility spectrometry (IMS), infrared and near-infrared (NIR) spectroscopy, Raman and x-ray fluorescence (XRF) spectroscopy, smartphone spectroscopy, and many others. Filling a significant gap in literature on the subject, the second volume of Portable Spectroscopy and Spectrometry: Features a significant amount of content published for the first time, or not available in existing literature Brings together work by authors with assorted backgrounds and fields of study Discusses the central role of applications in portable instrument development Covers the algorithms, calibrations, and libraries that are of critical importance to successful applications of portable instruments Includes chapters on portable spectroscopy applications in areas such as the military, agriculture and feed, hazardous materials (HazMat), art conservation, and environmental science Portable Spectroscopy and Spectrometry: Volume Two is an indispensable resource for developers of portable instruments in universities, research institutes, instrument companies, civilian and government purchasers, trainers, operators of portable instruments, and educators and students in portable spectroscopy courses.

Handbook of X-ray Imaging - Paolo Russo 2017-12-14

Containing chapter contributions from over 130 experts, this unique publication is the first handbook dedicated to the physics and technology of X-ray imaging, offering extensive coverage of the field. This highly comprehensive work is edited by one of the world's leading experts in X-ray imaging physics and technology and has been created with guidance from a Scientific Board containing respected and renowned scientists from

around the world. The book's scope includes 2D and 3D X-ray imaging techniques from soft-X-ray to megavoltage energies, including computed tomography, fluoroscopy, dental imaging and small animal imaging, with several chapters dedicated to breast imaging techniques. 2D and 3D industrial imaging is incorporated, including imaging of artworks. Specific attention is dedicated to techniques of phase contrast X-ray imaging. The approach undertaken is one that illustrates the theory as well as the techniques and the devices routinely used in the various fields. Computational aspects are fully covered, including 3D reconstruction algorithms, hard/software phantoms, and computer-aided diagnosis. Theories of image quality are fully illustrated. Historical, radioprotection, radiation dosimetry, quality assurance and educational aspects are also covered. This handbook will be suitable for a very broad audience, including graduate students in medical physics and biomedical engineering; medical physics residents; radiographers; physicists and engineers in the field of imaging and non-destructive industrial testing using X-rays; and scientists interested in understanding and using X-ray imaging techniques. The handbook's editor, Dr. Paolo Russo, has over 30 years' experience in the academic teaching of medical physics and X-ray imaging research. He has authored several book chapters in the field of X-ray imaging, is Editor-in-Chief of an international scientific journal in medical physics, and has responsibilities in the publication committees of international scientific organizations in medical physics. Features:

Comprehensive coverage of the use of X-rays both in medical radiology and industrial testing The first handbook published to be dedicated to the physics and technology of X-rays Handbook edited by world authority, with contributions from experts in each field
Investigations in X-Radiation Stimulation - Kamalaksha Das Gupta 1982
The objective is to invent a crystal x-ray laser. Investigations in the Radiation Research Lab. at Texas Tech University have established in a very straightforward way the line narrowing associated with a threshold pumping and a nonlinear rise in intensity. Recent work on x-ray Borrmann channeling via monocrystals has demonstrated the existence of a monochromatic x-ray beam without any vertical divergence. This would allow the transport of x-ray energy in space for thousands of miles without any loss of power. Preliminary experiments with a monocrystal excited by pulsed x-rays at Air Force Weapons Laboratory, KAFB, Albuquerque, seem to indicate a gain in intensity of the nondivergent hot spot with a concomitant fading of the regular Laue pattern. Current investigations in this line indicates that with proper doping of the monocrystal the nondivergent beam could be increased in intensity using a flash x-ray tube to pump the doped monocrystal. A conical target double beam flash x-ray line source instrument has been constructed to obtain a beam of nondivergent, stimulated, coherent, and monochromatic x-rays from doped monocrystals. A generation of stimulated x-rays using bunched electrons from pulsed high power klystron striking a monocrystal has been conceived.