



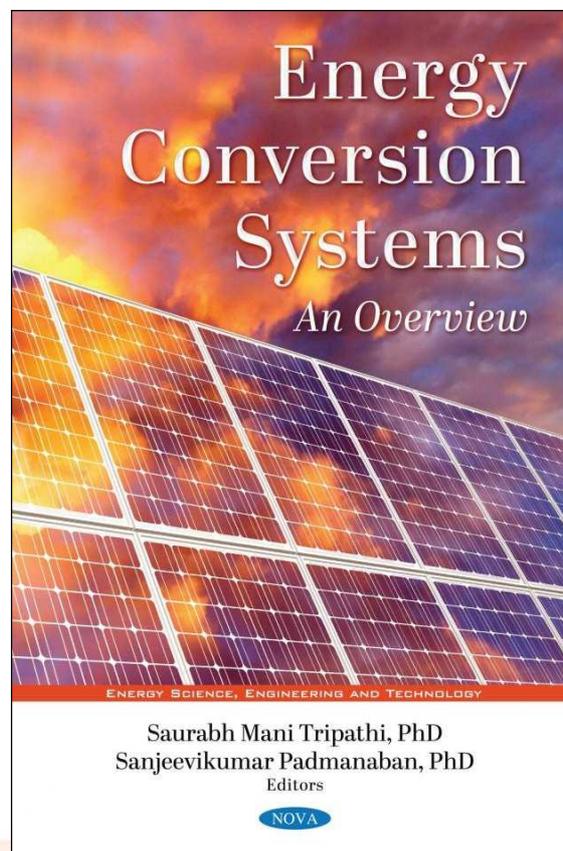
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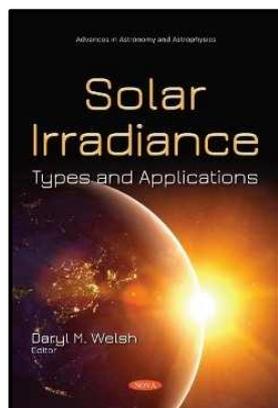
TITLES PUBLISHED BY NOVA SCIENCE

- Advances in Astronomy & Astrophysics · Advances in Energy Research
- Classical & Quantum Mechanics · Electrical Engineering Developments
- Energy Science, Engineering & Technology · Horizons in World Physics
- Physics Research & Technology · Space Science, Exploration & Policies

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Advances in Astronomy & Astrophysics



Solar Irradiance Types and Applications

Edited by Daryl M. Welsh

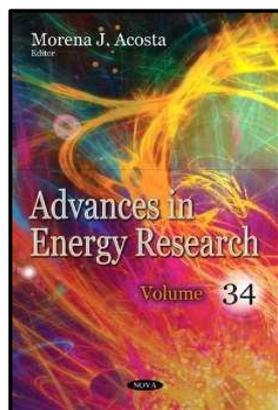
Solar Irradiance: Types and Applications first presents intelligent models for sizing, parameters forecasting and control of a photovoltaic system on the basis of a modified fuzzy neural net. The modified fuzzy neural net provides automatic fulfillment and modification of all proposed intelligent models.

Following this, the authors discuss modeling direct normal irradiance at the Earth's surface. In addition to looking traditionally at direct normal irradiance as a fuel for concentrating solar systems, its use in computing the sunshine number is also explored.

The closing study explores the potential of using simple empirical and artificial neural network models to estimate global solar radiation on a horizontal surface. Algeria was used as a case study and four statistical parameters were chosen to assess the performances of each model or approach.

PB 9781536187861 £75.99 November 2020 Nova Science Publishers 132 pages

Advances in Energy Research



Advances in Energy Research Volume 34

Edited by Morena J. Acosta

This compilation first describes a system wherein a high-nuclear high-temperature reactor supplies constant power to a thermal energy storage unit of molten lithium chloride salt, which provides the required thermal energy for a closed energy conversion system.

Next, a compact power generation-storage system is constructed using a direct current-alternating current inverter, spherical Si solar cells, and a lithium-ion battery integrated into a single module.

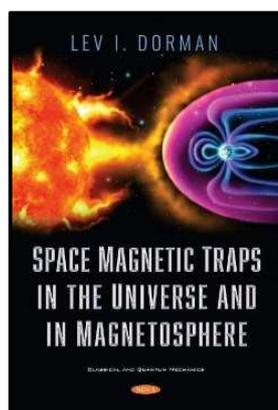
The authors discuss how, since a number of different countries' electric power utilities are adding capacity, there is an opportunity to introduce a new, longer-lasting design for a wind turbine system.

A method to reduce the consumption of high-pressure steam and cool fluid in the ethanol process is presented, as well as a plan to reduce the emission of environmental pollutants from the H-501 furnace in the maleic anhydride process.

Energy optimization is carried out for the condensation stabilization component of Ilam gas refinery.

The closing study focuses on techniques such as the adjacent tree-bounded hop algorithm that may be used to reduce the energy consumption of wireless sensor networks, whether static or dynamic.

HB 9781536189803 £229.99 December 2020 Nova Science Publishers 207 pages



Space Magnetic Traps in the Universe and in Magnetosphere

Lev I. Dorman

The importance and actuality of investigation *Space Magnetic Traps in the Universe and in Magnetosphere* are based on following four factors:

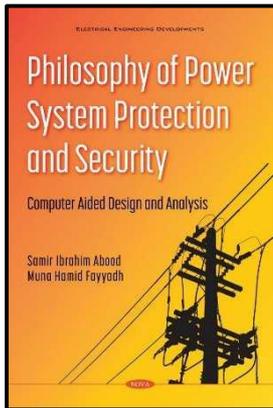
1. Space Magnetic Traps in the Universe for Cosmic Ray particles (Astroparticles, Run Away Particles) on different studies of the Universe's evolution and in different objects (galaxies of different types, quasars, nucleus of galaxies, Sun and stars, Heliosphere and Stellar Spheres, solar and stellar winds, magnetospheres of planets, and so on) are very interested and important in the frame of fundamental science (Astrophysics, Plasma Physics and Magneto-Hydrodynamics, Nuclear and Elementary Particle Physics, Geophysics). This problem is interested also for applications (e.g., problem of controlled thermo-nuclear reactions in magneto-plasmas traps as main source for energy in near future for the Earth's Civilization).

2. The Magnetosphere is the nearest giant natural laboratory where with satellites and ground measurements is possible to investigate different plasmas and energetic processes in space caused by interaction of high kinetic energy solar wind plasmas with frozen in Interplanetary Magnetic Fields–IMF and its perturbations (Interplanetary Coronal Mass Ejections–ICMEs, Interplanetary Shock Waves–ISWs, Interplanetary Interaction Regions–IIRs, and so on) with the rotated main geomagnetic field. This interaction leads to a dynamic transformation of magnetic fields in the Magnetosphere, formation Space Magnetic Traps (Radiation Belts), generation and trapping of high energy particles (which can be called Magnetospheric Cosmic Rays–MCR), and generation of different types of instabilities and electromagnetic radiations. These processes are similar to processes in magnetospheres of other planets and their moons, in the atmosphere of the Sun and other stars, in interplanetary and in interstellar space, and in many different astrophysical objects in the Universe. This research presents an important basis for fundamental space in frame of Astrophysics, Plasma Physics and Magneto-Hydrodynamics, Nuclear and Elementary Particle Physics, Geophysics.

3. In modern time, technology, economics, navigation, TV, internet, radio-connections, military aspects, and the life of people on our planet are strongly connected by the work of many satellites moving inside the Magnetosphere. Different processes and MCR in the magnetosphere influence how the satellites work and often lead to satellite malfunctions, sometimes completely destroying their electronics and satellites become 'dead'. The described research can be considered as a basis for developing methods of forecasting dangerous situations for satellites on different orbits and to decrease the risk of satellite malfunctions and of losing them. It means that this research has important practical applications.

4. The interaction of ICME, ISW, and IIR with the Magnetosphere leads to the generation of big magnetic storms accompanied by Cosmic Ray Forbush–decrease and precursory effects in Galactic Cosmic Ray (GCR) intensity. These magnetic storms are dangerous, not only for satellites, but also for Earth's surface regarding technology, radio-connections, car accidents, and human health (e.g., increasing frequency of infarct myocardial and brain strokes). Investigation of causes of magnetic storms can help to develop methods of their forecasting and decrease the level of magnetic storm hazards. Therefore, the other practical application of this research is connected with the problem of space weather and space climate influence on the technology, radio-connections, navigation, transportation, and human health on the Earth in dependence of altitude and geomagnetic latitude.

HB 9781536183221 £288.99 September 2020 Nova Science Publishers 610 pages



Philosophy of Power System Protection and Security Computer Aided Design and Analysis

Computer Aided Design and Analysis

Samir Ibrahim Abood

Philosophy of power system Protection and Security, Computer-Aided design and Analysis is a textbook that provides an excellent focus on the advanced topics of power system protection and gives exciting analysis methods and covers the important applications in the power systems relaying. Each chapter opens with a historical profile or career talk, followed by an introduction that states the chapter objectives, links the chapter to the previous ones, and then introduces each chapter. All principles are presented in a lucid, logical, step-by-step approach. The authors avoid wordiness and detail overload that could hide concepts and impede understanding as much as possible. In each chapter, the authors present some of the solved examples and applications using a computer program.

Toward the end of each chapter, the authors discuss some application aspects of the chapter's concepts using a computer program.

In recognition of requirements by the Accreditation Board for Engineering and Technology (ABET) on integrating computer tools, the use of MATLAB® is encouraged in a student-friendly manner. MATLAB® is introduced and applied gradually throughout the book.

Practice problems immediately follow each illustrative example. Students can follow the example step by step to solve the practice problems without flipping pages or looking at the book's answers. These practice problems test students' comprehension and reinforce key concepts before moving on to the next section.

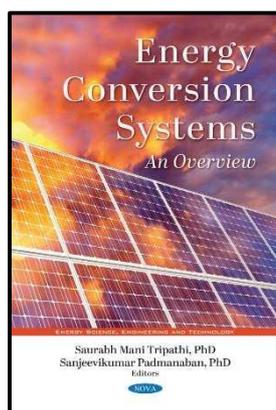
The book has more than ten categories and millions of power readers. It can use in more than 400 electrical engineering departments at the top of universities worldwide.

Designed for a three-hour semester course on power system protection and security is intended as a textbook for a graduate, senior-level undergraduate student in electrical and computer engineering. The prerequisites for a course based on this book are knowledge of standard mathematics, including calculus and complex numbers.

The book is intended as a textbook for a senior-level undergraduate student in electrical and computer engineering departments and appropriate for Graduate Students, Industry Professionals, Researchers, and Academics. The book gives rich information for the industrial engineer and electric control engineer because it contains more details about power network protection and security.

The reader will be able to model, design, and implement different parts of the power system relaying after he/she finishes reading this book. After finishing reading the book, the reader will be able to manage and control the power system parameters, and it will help him in power station work and control centers. The book will assist the researchers in their field of power system track. The student will improve coordination between power demand and generation and use of modern information technology and program.

HB 9781536190991 £247.99 February 2021 Nova Science Publishers 437 pages

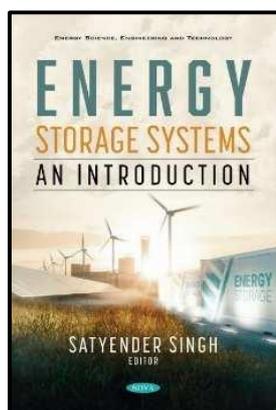


Energy Conversion Systems An Overview

Edited by Saurabh Mani Tripathi

This edited book is intended to serve as a resource for engineers, scientists and specialists engaged in becoming familiarized with green energy conversion for a clean atmosphere with an adaption of 'more-renewable' for power generation. The book is comprised of nine original chapters dealing with state-of-the-design exercises on power conversion/storage technologies. It highlights the critical features of energy technology for green engineering for the future. This edited volume is an extensive collection of state-of-the-art studies on the subject.

HB 9781536191318 £211.99 February 2021 Nova Science Publishers 372 pages



Energy Storage Systems An Introduction

Edited by Satyender Singh

This book is primarily for undergraduates, graduates and research scholars working in the field of energy storage systems. The book details the mathematical and experimental analysis of energy storage systems and can be referenced by different engineering sectors, including: mechanical, chemical, civil and energy engineering, and is equally important for scholars of physics and chemistry. Various aspects of thermal energy storage systems are described, such as lithium-ion batteries, nuclear reactors, latent heat storage with PCM embedded porous media, CCHP with TESS, PCM in solar collectors, and grain dryers.

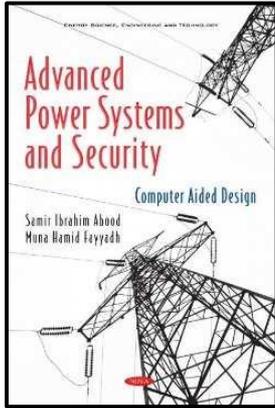
Chapter one provides an overview of the development of various kinds of cathodes and anodes. In short, this chapter is an outline of the development stages of Li-ion battery electrochemistry, discussing the commercial success and current challenges in the field with mitigation strategies, as well as the future of Li-ion batteries.

In the system described in chapter two, a high-nuclear high-temperature reactor supplies constant power to the thermal energy storage unit of molten lithium chloride salt, which provides the required thermal energy for a closed energy conversion system of the Bryton cycle. During regular operation, the thermal energy storage unit stores heat overnight for use during peak demand periods in the day. In this case, the nuclear reactor remains at a constant level of thermal capacity.

A detail of energy storage in PCM embedded with porous media is presented in chapter three, and the applications of such systems are presented in chapter four. PCM has gained the attention of researchers due to longer thermal recycling and chemical stability. Moreover, high latent heat capacity is one of the most significant aspects contributing to the popularity of PCMs, and the low thermal conductivity of PCMs limits their usage in many thermal applications and can be improved by using porous media as an embedded material. Chapter five delineates the optimal working point of a system consisting of several independent units capable of trading electricity based on the consumption of various fuels. The utilization of a heat storage tank was determined using a genetic algorithm, and the modeling accuracy was compared. Chapters six and seven present a clear understanding of the working and investigation procedures of natural convection grain dryers.

This book will be helpful for understanding the fundamentals of thermal energy storage systems.

HB 9781536188738 £178.99 December 2020 Nova Science Publishers 288 pages



Advanced Power Systems and Security Computer Aided Design

Samir Ibrahim Abood

Advanced Power Systems And Security: Computer-Aided Design is a textbook that provides an excellent focus on the advanced topics of the power system and gives exciting analysis methods and a cover of the important applications in the power systems. At the beginning of each chapter, an abstract that states the chapter objectives. And then the introduction for each chapter. All principles are presented in a lucid, logical, step-by-step approach. As much as possible, the authors avoid wordiness and detail overload that could hide concepts and impede understanding, and In each chapter, the authors present some of the solved examples and applications using a computer program.

Toward the end of each chapter, the authors discuss some application aspects of the concepts covered in the chapter using a computer program.

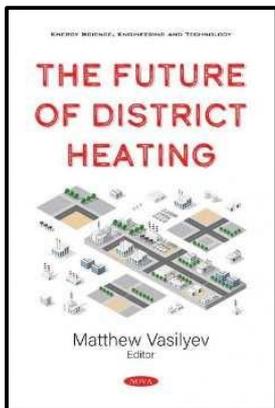
In recognition of requirements by the Accreditation Board for Engineering and Technology (ABET) on integrating computer tools, the use of MATLAB® and ATP version of the Electromagnetic Transients Program (EMTP) are encouraged in a student-friendly manner. MATLAB® is introduced in Appendix C and applied gradually throughout the book.

Each illustrative example is immediately followed by practice problems. Students can follow the example step by step to solve the practice problems without flipping pages or looking at the end of the book for answers. These practice problems test students' comprehension and reinforce key concepts before moving on to the next section.

The book is intended as a textbook for a senior-level undergraduate student in electrical and computer engineering departments, and appropriate for Graduate Students Industry Professionals, Researchers, and Academics.

The book has more than 11 categories and millions of power readers, and it can use in more than 400 electrical engineering departments at the top of universities all over the world.

HB 9781536187854 £247.99 November 2020 Nova Science Publishers 348 pages



The Future of District Heating

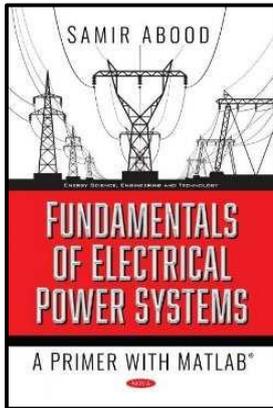
Edited by Matthew Vasilyev

The Future of District Heating begins by discussing the way in which designing district heating systems to operate below 167F (75C) reduces the overall delivered cost of heat by reducing the capital cost of the heat source, allowing for the use of non-traditional and renewable sources, reducing the cost of piping, and allowing for the use of large-scale thermal storage.

The authors describe the development of the provisions of the European Union law which apply to district heating to examine the particular legal acts in force, and provide an outlook on future developments.

In closing, an experimental investigation is presented on a closed-loop earth-to-air heat exchanger (underground air tunnel) in heating mode.

PB 9781536186550 £75.99 October 2020 Nova Science Publishers 123 pages



Fundamentals of Electrical Power Systems A Primer with MATLAB

Samir Abood

Fundamentals of Electrical Power Systems: A Primer With MATLAB®, is a textbook provides an excellent review of fundamental of the power system and give exciting analysis methods and a cover of the all components of power systems. At the beginning of each chapter, an abstract that states the chapter objectives. And then the introduction for each chapter. All principles presented in a lucid, logical, step-by-step approach. As much as possible, the author avoids wordiness and detail overload that could hide concepts and impede understanding. and In each chapter, the author presents some of the solved examples and applications using a computer program.

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The book is intended as a textbook for a senior-level undergraduate student in electrical and computer engineering departments, and appropriate for Juniors, Undergraduate Students, Graduate Students Industry Professionals, Researchers, and Academics.

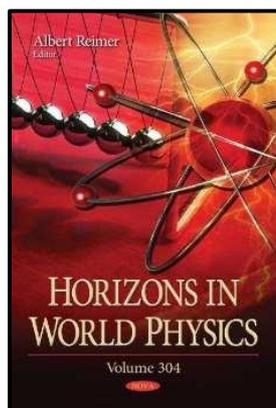
The prerequisites for a course based on this book are knowledge of standard mathematics, including calculus and complex numbers.

The book's strengths

- The book using for various academic and industrial levels.
- The book is giving rich and essential information about power systems and give the fundamental study for next book (power system protection and control)
- The book Including a lot of solved examples and problems in each chapter.
- The results obtained from the MATLAB program for different topics.
- Power system protection and control will include in the next part of the book.

HB 9781536186376 £284.99 December 2020 Nova Science Publishers 507 pages

Horizons in World Physics



Horizons in World Physics

Volume 304

Edited by Albert Reimer

In this compilation, the authors describe a volume source of negative hydrogen ions on the basis of Penning ionization gauge with a metal hydride cathode, which plays the role of a cathode and the solid-state generator of working gas.

Next, a study is carried out in two cases of constant and variable charges of dust grains. Consideration of the dust charge variation requires the evaluation of charging currents.

The possibilities of ultra short pulsed laser deposition for modified scratch-resistant surfaces in industrial and optical applications are demonstrated and reviewed.

Additionally, results of investigations on new types of silicon p-n junction diodes are presented. As temperature sensors, these types of silicon don't have the disadvantages inherent to usual commercial devices when they are employed at low temperatures and in the presence of magnetic fields.

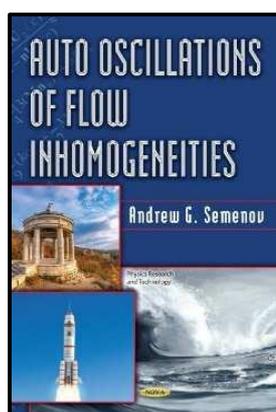
In the subsequent study, it is found that all bodies are characterized by a neutrino halo which is formed by an equilibrium interaction between the surrounding neutrinos and the neutrino field of the atomic nuclei from the object.

The authors match an exterior solution of a spherically symmetric wormhole to the general interior vacuum solution with specific values of the arbitrary function at the junction interface, thus determining the surface stresses on the thin shell.

In closing, the Becchi-Rouet-Stora-Tyutin and anti-Becchi-Rouet-Stora-Tyutin symmetries of gauge theories are recapitulated. This symmetry plays an important role in proving the unitarity and renormalizability of these theories.

HB 9781536184402 £229.99 September 2020 Nova Science Publishers 198 pages

Physics Research & Technology

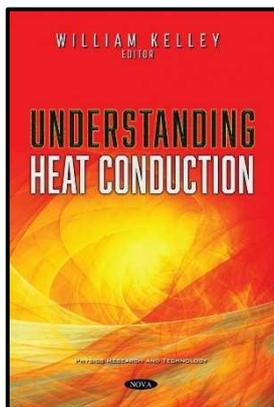


Auto Oscillations of Flow Inhomogeneities

Andrey Semenov

The book provides the analysis and researches results related to flow inhomogeneities auto oscillations observed in free subsonic and supersonic jet flow as well as during jet flow interaction with adjacent bodies, acoustic resonators, ejectors and valves. It demonstrates the laws, relationships and experimental evidences for various auto oscillations phenomena directly related to incident flow regimes based on conditions of flow boundary instability and feed back mechanism realized by corresponding sound field radiated due to periodic hydrodynamic disturbances reflection propagating in opposite to flow direction in the form of sound impulses exciting flow origin. Book results allow devoting particular attention to auto oscillations condition prediction and in a sense to their control. Book is addressed to physicists, acousticians and hydrodynamics engineers developing low noise and vibration aircrafts, ships and space vehicles with aid of adjacent flow and jet flow auto oscillations cancellation as well as to specialists involved in flow induced auto oscillations sound sources efficiency increase research, say, related to musical instruments or to biological research of man and animal voice properties. Book will be useful as well to undergraduate and graduate students of these specialties.

HB 9781536186963 £284.99 December 2020 Nova Science Publishers 329 pages

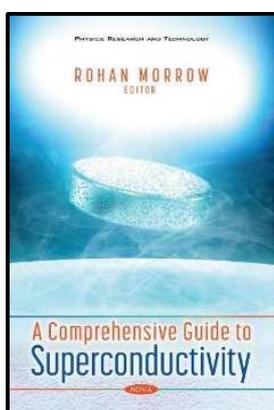


Understanding Heat Conduction

Edited by William Kelley

The first chapter of this book proposes an analytical Fourier series solution to the equation for heat transfer by conduction in a spherical shell with an internal stone consisting of insulating material as a model for the kinetic of temperature in stone fruits both as a general solution and a mass average value. The chapter also considers an internal heat source linearly reliant on temperature. The second chapter focuses on the sensitivity of the numerical modeling technique for conjugate heat transfer involving high speed compressible flow over a cylinder. The last chapter presents an overview of the fundamental solution (FS) based finite element method (FEM) and its application in heat conduction problems. First, basic formulations of FS-FEM are presented, such as the nonconforming intra-element field, auxiliary conforming frame field, modified variational principle, and stiffness equation. Then, the FS-FE formulation for heat conduction problems in cellular solids with circular holes, functionally graded materials, and natural-hemp-fiber-filled cement composites are described.

PB 9781536191820 £87.99 January 2021 Nova Science Publishers 180 pages



A Comprehensive Guide to Superconductivity

Edited by Rohan Morrow

A Comprehensive Guide to Superconductivity discusses the societal and environmental benefits of superconducting devices in electric transportation systems, introducing the electric and thermal characteristics of superconducting devices as well as providing an analysis of their cryogenic systems.

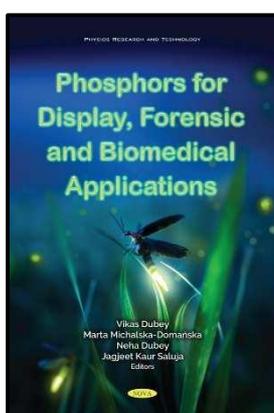
The authors describe the main principles of spectroscopic methodology for the analysis of gapped electronic spectra and the electron-boson interaction leading to Cooper pair formation and, in turn, Fermi-sea instability.

Additionally, methods to optimize the design of a 2G AC power cable are presented with the goal of providing uniform current distribution among cable layers.

Beginning with an introduction to Pauli limited superconducting systems, solid state and ultra cold atomic gas setups which host the Fulde-Ferrell-Larkin-Ovchinniko superconducting phase are studied, along with relevant experimental diagnostics and reported observations.

In closing, the authors discuss the theoretical understanding of Josephson transport in hybrid superconductor quantum dot devices. In particular, Josephson transport is studied through an uncorrelated single-level quantum dot coupled between two Bardeen-Cooper-Schrieffer superconducting leads, modeled by single-impurity Anderson Hamiltonian.

HB 9781536189018 £146.99 December 2020 Nova Science Publishers 232 pages

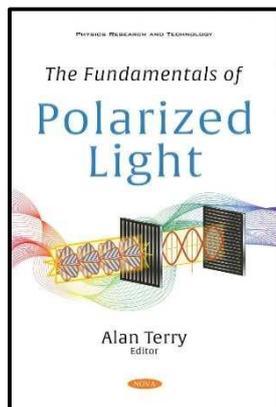


Phosphors for Display, Forensic and Biomedical Application

Edited by Vikas Dubey

The demand for phosphors with advanced performance capabilities is increasing due to recent technical developments in the display, lighting, and fluorescence labeling sectors. Rare-earth doped phosphors have been the focus of the research community, owing to their widespread applications in display devices, temperature sensors, solar cells, etc. This book reviews the broad aspects of organic and inorganic materials-based phosphors, and will be beneficial to undergraduate, graduate, and postgraduate students. It provides an up-to-date account of the advancement of various techniques for the synthesis of phosphors and their applications. Experimental and theoretical approaches related to the rare-earth-doped luminescent materials are explored.

HB 9781536189377 £211.99 February 2021 Nova Science Publishers 327 pages



The Fundamentals of Polarized Light

Edited by Alan Terry

This compilation opens with a review of the state of the art of enamel birefringence interpretation, its limitations, and potential applications in various fields, such as: caries research, forensic dentistry, anthropology, paleontology, and evolutionary biology.

The authors demonstrate a novel concept for the reproduction of the “movement without frame-by-frame display technique” developed by the Lumiere brothers in 1895 in their cinematograph motion picture system.

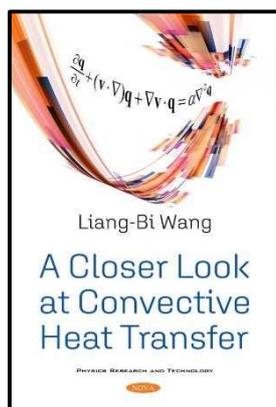
The current evidence base surrounding the use of both monochromatic and polychromatic polarized photobiomodulation is reviewed, specifically related to wound healing and musculoskeletal conditions.

Following this, to induce molecular orientations such as the symmetry operation of crystals, the authors study circularly or linearly polarized UV light irradiation in hybrid materials.

New chiral Schiff base metal Ni(II) and Zn(II) complexes containing an azobenzene moiety in ligands are synthesized, in which substituents (H, Cl) at the ortho position of azobenzene are introduced for wavelength-selective molecular orientation by light irradiation.

In closing, the authors design new metal complexes with a rigid Y-shaped structure with a photoisomerization moiety aligned by polarized UV light and expected to cause the Weigert effect.

HB 9781536189773 £146.99 January 2021 Nova Science Publishers 211 pages



A Closer Look at Convective Heat Transfer

Edited by Liang-Bi Wang

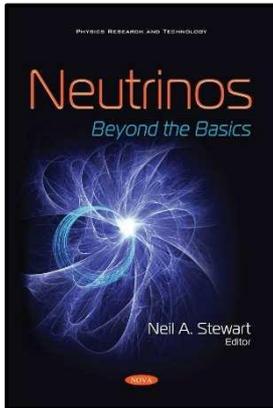
Convective heat transfer plays a role in many branches of science and engineering, as well as in aspects of daily life. Due to its importance, it deserves to be given a closer look. This book shows some real complexities of convective heat transfer in more rigorous ways, with most aspects described by partial differential equations. Defined by Fourier's law, heat flux is transported by convection. Thus, the transport of heat flux can be described using the convective transport equation of the heat flux, which may provide more information. The significance of this description is that the velocity gradient's contribution to the transport of heat flux is stated implicitly and may be connected to the mechanical dissipation.

A description of the transport of the momentum flux is provided in this book, focusing on both the mechanical energy prepared by production from the main flow and the mechanical energy dissipated by vorticity. Based on the convective transport equations of heat flux and momentum flux, a correlation between the contribution to the transport of heat flux and mechanical energy production and dissipation is established.

Additional topics discussed herein include the transport characteristics of heat flux, the impact of velocity and its gradients on the transport of heat flux in a channel flow, a tube flow, a channel flow with vortex generators and a twisted elliptical tube flow. As secondary flow and vorticity are commonly used for the enhancement of convective heat transfer, the roles of secondary flow and vorticity in the convective transport of heat flux are discussed.

The intensity of convective heat transfer is only defined by the surface which heat is transferred through; it is not defined in the fluid region. Combustion science, oceanography, meteorology, and geoscience pay much attention to local convective heat transfer intensity. This book verifies the rationality of local convective heat transfer intensity.

HB 9781536190410 £211.99 April 2021 Nova Science Publishers 363 pages



Neutrinos Beyond the Basics

Edited by Neil A. Stewart

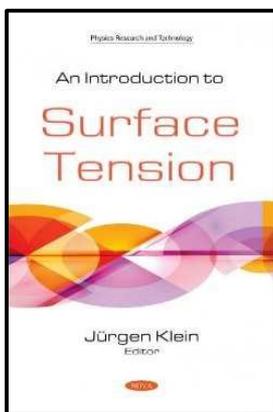
In this compilation, the authors first investigate the potential use of mineral lorandite from Allchar to estimate the Sun's age.

A brief history of the discovery of neutrinos is provided, focusing on properties such as electrical charge, mass, and sources. A brief introduction to neutrinos in the standard model of particle physics is also provided, followed by neutrino oscillations both in vacuum and in matter.

Special experiments involving neutrino beams generated by accelerators are planned to study the properties of neutrinos on long baselines.

Lastly, within the context of a U(1)B-L minimal model, the authors discuss the effects of the anomalous magnetic moment and electric dipole moment of the tau-neutrino on stellar energy loss rates through the process of pair-annihilation.

PB 9781536186789 £87.99 December 2020 Nova Science Publishers 167 pages



An Introduction to Surface Tension

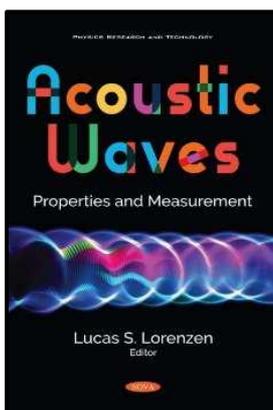
Edited by Jürgen Klein

The term "surface tension" reflects the nature of intermolecular forces in neighboring liquid and vapor phases. Surface tension decreases with increasing temperature, and drops to zero value at critical temperature. To a small extent, it is influenced by pressure and the interface curvature.

An Introduction to Surface Tension discusses the possibility of a significant use of surfactants, polymers, alkali and microbes for surface tension alteration based on work done in the last decades, with new insight on the chemical aspects, especially for gas recovery from shale by altering surface tension.

In closing, the authors propose a model based on the concept that surfactant and polymer molecules rotate during the process reaching the equilibrium surface state, which is different from the conventional adsorption theory.

PB 9781536183788 £87.99 September 2020 Nova Science Publishers 165 pages



Acoustic Waves Properties and Measurement

Edited by Lucas S. Lorenzen

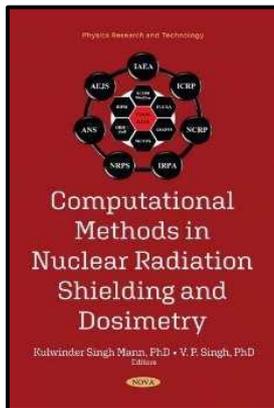
Acoustic signal analysis is commonly used for non-invasive pipeline condition assessment and diagnosis. Considering that pipeline systems are made of different materials ranging from steel to polymers, the analysis method is also contingent on the vibroacoustic properties of the pipe wall material.

In this compilation, an adaptive, locally defined time marching technique is presented to analyze wave propagation models. The methodology is based on two time integration parameters, namely α and γ .

Additionally, the authors present recent improvements in acoustic impedance methods to describe the transduction and propagation of guided elastic waves in MEMS devices electrostatically actuated through thin air-gaps.

The closing study focuses on the way in which the Lorentz force acting on a continuous medium from the side of the magnetic field has a significant effect on the behavior of magnetoacoustic waves.

PB 9781536184051 £87.99 September 2020 Nova Science Publishers 185 pages



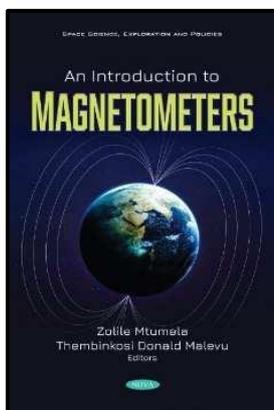
Computational Methods in Nuclear Radiation Shielding and Dosimetry

Edited by Kulwinder Singh Mann

This book is a compilation of the most widely used computational methods and techniques for calculating shielding parameters that are required for radiation-shielding investigations of dosimetric materials. The theoretical, experimental, and simulation methods and their applications are described. The book is divided into thirteen chapters that are arranged in a systematic order and written by experienced scientists and academicians worldwide. The gamma-ray shielding parameter calculations with the Monte Carlo simulation techniques viz. MCNP, GEANT4, FLUKA, and EGS5 codes are illustrated. Descriptions of various software such as XCOM, WinXCom, FLUKA, Phy-X, BMIX, ASFIT, and ANSI are provided. A review of fundamental quantities for calculation of ambient dose, i.e., photon and neutron buildup factors, is presented. A phantom-based computation model has been included to indicate the applications of radiation dosimetry in medical diagnostics. The chapters on computed-tomography (CT) have been included to provide insight into the radiations' diagnostic capabilities and applications. The shielding effectiveness of some materials such as ignimbrite rocks, amorphous metals, marbles, dosimetric materials, and novel shielding materials have been investigated. The most recent concept of multi-layered shielding and related buildup factors' influence on the shielding effectiveness is described with a computer program, the RIMP-TOOLKIT. This book is the result of the authors' hard-work and determination during the worldwide lockdown period caused by the spread of COVID-19. The conclusions presented in this book will be useful in nuclear radiation shielding and for dosimetric purposes. Additionally, this book will be helpful for postgraduate students of physics and chemistry.

HB 9781536185270 £211.99 October 2020 Nova Science Publishers 355 pages

Space Science, Exploration & Policies



An Introduction to Magnetometers

Edited by Zolile Mtumela

Ground magnetometer observations have played a major role in the development of space science, by remotely measuring currents that define the dynamics of the magnetosphere and Earth's ionosphere. They have led to the identification of ionospheric currents associated with magnetic substorms and storms, as well as those associated with global compressions of the magnetosphere from interplanetary shocks and bow shock-related instabilities. Ground magnetometer observations have made it possible to track and comprehend the way reconfigurations of currents and convection are propagated globally after the magnetosphere is impacted by solar wind and/or interplanetary magnetic field dynamics. Global ground magnetometer observations provide the most fundamental and necessary context that needs to exist if any of the current and future missions are to provide new discovery science within the Near-Earth Environment. While their role as a continuous monitor and context-providing source is paramount, their continuous operation on a now-global scale provides the means for research science at the systems. The above overview of the magnetometers on space-based magnetometers are by no means intended to be complete, but is to illustrate the historic success of magnetometers and the contributions to our understanding of space physics and related fields.

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