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Progress in Physics, vol. 4/2015 Progress in Physics, vol. 2/2015 Applications in Physics Super 10 Mock Tests for KVPY SB/ SX for Class 12 - 2nd Edition Active Matter and Nonequilibrium Statistical Physics Auto-Segmentation for Radiation Oncology Fractional Dynamics Effective Field Theory in Particle Physics and Cosmology Applied Physics, System Science and Computers III Time-Symmetry Breaking in Turbulent Multi-Particle Dispersion ICOM2015 Book of Abstracts The Handbook of Secondary Gifted Education The Physics of Solar Energy Conversion Selected Proceedings from the 231st ECS Meeting Quantum Machine Learning 2D Materials Thermoelectrics for Power Generation Nanoplasmonics Advances in Condensed-Matter and Materials Physics Introduction to Particle and Astroparticle Physics Experimental Research of Cavity Optomechanics New Uses of Micro and Nanomaterials Techno-Economic Challenges of Green Ammonia as an Energy Vector BERRU Predictive Modeling The Cosmic Spacetime Physics of the Human Temporality Computed Tomography - E-Book Yearbook of International Organizations 2014-2015 Advances in Sensors: Reviews, Vol. 5 Darwin's Medicine Data Interpretation & Data Sufficiency for CAT & Other MBA Exams 2nd Edition New Physics At The Large Hadron Collider - Proceedings Of The Conference Thorium—Energy for the Future Advances in Neural Networks – ISNN 2015 Oswaal Kamataka PUJ Solved Papers II PUC Physics Book Chapterwise & Topicwise (For 2023 Exam) Progress in Physics, vol. 1/2016 Collapse of the Wave Function Information and Randomness Applied Nuclear Physics at Accelerators Statutes and Ordinances of the University of Cambridge 2015

Thermoelectrics for Power Generation Jun 14 2021 Thermoelectrics for Power Generation - A Look at Trends in the Technology is the first part of the InTech collection of international community works in the field of thermoelectric power generation. The authors from many countries have presented in this book their achievements and vision for the future development in different aspects of thermoelectric power generation. Remarkably, this hot topic unites together efforts of researchers and engineers from all continents of our planet. The reader will find in the book a lot of new interesting information concerning prospective materials for thermoelectric generators, both inorganic and organic; results of theoretical studies of materials characteristics; novel methods and apparatus for measuring performance of thermoelectric materials and devices; and thermoelectric power generator simulation, modeling, design, and practice.

Experimental Research of Cavity Optomechanics Feb 08 2021 This thesis presents experimental research on the interaction between the optical field and the mechanical oscillator in whispering-gallery mode microcavities. It demonstrates how optomechanical interactions in a microresonator can be used to achieve non-magnetic non-reciprocity and develop all-optically controlled non-reciprocal multifunctional photonic devices. The thesis also discusses the interaction between the travelling optical and mechanical whispering-gallery modes, paving the way for non-reciprocal light storage as a coherent, circulating acoustic wave with a lifetime of up to tens of microseconds. Lastly, the thesis presents a high-frequency phase-sensitive heterodyne vibrometer, operating up to 10 GHz, which can be used for the high-resolution, non-invasive mapping of the vibration patterns of acoustic devices. The results presented here show that optomechanical devices hold great potential in the field of information processing.

New Physics At The Large Hadron Collider - Proceedings Of The Conference Feb 29 2020 The Standard Theory of Particle Physics describes successfully the observed strong and electroweak interactions, but it is not a final theory of physics, since many aspects are not understood: (1) How can gravity be introduced in the Standard Theory? (2) How can we understand the observed masses of the leptons and quarks as well as the flavor mixing angles? (3) Why are the masses of the neutrinos much smaller than the masses of the charged leptons? (4) Is the new boson, discovered at CERN, the Higgs boson of the Standard Theory or an excited weak boson? (5) Are there new symmetries at very high energy, e.g. a broken supersymmetry? (6) Are the leptons and quarks point-like or composite particles? (7) Are the leptons and quarks at very small distances one-dimensional objects, e.g. superstrings? This proceedings volume comprises papers written by the invited speakers discussing the many important issues of the new physics to be discovered at the Large Hadron Collider.

The Handbook of Secondary Gifted Education Nov 19 2021 The second edition of this groundbreaking textbook is designed to help education professionals interested in building effective and comprehensive educational opportunities for gifted secondary students. The Handbook of Secondary Gifted Education offers an in-depth, research-based look at ways schools and classrooms can support the development of gifted adolescents. The book is the most comprehensive critical resource on this topic available. Each chapter of this educational resource is written by leading scholars and researchers in the field. The second edition includes sections on STEM, CCSS alignment, and 21st-century skills, along with discussion of working with secondary students in various content areas. The purpose of the book is to provide a research-based handbook that views gifted adolescents and their needs as the starting point for building an effective, integrated educational program.

Collapse of the Wave Function Sep 25 2019 This is the first single volume about the collapse theories of quantum mechanics, which is becoming a very active field of research in both physics and philosophy. In standard quantum mechanics, it is postulated that when the wave function of a quantum system is measured, it no longer follows the Schrödinger equation, but instantaneously and randomly collapses to one of the wave functions that correspond to definite measurement results. However, why and how a definite measurement result appears is unknown. A promising solution to this problem are collapse theories in which the collapse of the wave function is spontaneous and dynamical. Chapters written by distinguished physicists and philosophers of physics discuss the origin and implications of wave-function collapse, the controversies around collapse models and their ontologies, and new arguments for the reality of wave function collapse. This is an invaluable resource for students and researchers interested in the philosophy of physics and foundations of quantum mechanics.

ICOM2015 Book of Abstracts Dec 21 2021

Data Interpretation & Data Sufficiency for CAT & Other MBA Exams 2nd Edition Mar 31 2020 The book covers all the aspects of Data Interpretation & Data Sufficiency. The book is divided into 7 chapters. Each chapter describes the concepts related to the chapter along with numerous Solved Examples. The theory portion is followed by 5 levels of exercises in each chapter: 1. Concept Applicator 2. Concept Builder 3. Concept Cracker 4. Concept Deviator 5. Concept Eliminator The past questions of major exams like CAT/ XAT/ IIFT/ SNAP are covered in the book.

Advances in Sensors: Reviews, Vol. 5 Jun 02 2020 The Vol. 5 of this Book Series contains 22 chapters written by 79 contributors-experts from universities, research centres and industry from 15 countries: Australia, Canada, China, France, Germany, Italy, Malaysia, Mexico, Poland, Portugal, Russia, Slovenia, Spain, Ukraine and USA. This volume contains information at the cutting edge of sensor research and related topics from the following three areas: Physical Sensors, Sensor Networks and Remote Sensing. Coverage includes current developments in various sensors, sensor instrumentation and applications. In order to offer a fast and easy reading of each topic, every chapter in this volume is independent and self-contained. With the unique combination of information in this volume, the 'Advances in Sensors: Reviews' Book Series will be of value for scientists and engineers in industry and at universities, to sensors developers, distributors, and end users.

Auto-Segmentation for Radiation Oncology May 26 2022 This book provides a comprehensive introduction to current state-of-the-art auto-segmentation approaches used in radiation oncology for auto-delineation of organs-at-risk for thoracic radiation treatment planning. Containing the latest, cutting edge technologies and treatments, it explores deep-learning methods, multi-atlas-based methods, and model-based methods that are currently being developed for clinical radiation oncology applications. Each chapter focuses on a specific aspect of algorithm choices and discusses the impact of the different algorithm modules to the algorithm performance as well as the implementation issues for clinical use (including data curation challenges and auto-contour evaluations). This book is an ideal guide for radiation oncology centers looking to learn more about potential auto-segmentation tools for their clinic in addition to medical physicists commissioning auto-segmentation for clinical use. Features: Up-to-date with the latest technologies in the field Edited by leading authorities in the area, with chapter contributions from subject area specialists All approaches presented in this book are validated using a standard benchmark dataset established by the Thoracic Auto-segmentation Challenge held as an event of the 2017 Annual Meeting of American Association of Physicists in Medicine

Applications in Physics Aug 29 2022 This multi-volume handbook is the most up-to-date and comprehensive reference work in the field of fractional calculus and its numerous applications. This fourth volume collects authoritative chapters covering several applications of fractional calculus in physics, including classical and continuum mechanics.

Super 10 Mock Tests for KVPY SB/ SX for Class 12 - 2nd Edition Jul 28 2022

Quantum Machine Learning Aug 17 2021 Quantum-enhanced machine learning refers to quantum algorithms that solve tasks in machine learning, thereby improving a classical machine learning method. Such algorithms typically require one to encode the given classical dataset into a quantum computer, so as to make it accessible for quantum information processing. After this, quantum information processing routines can be applied and the result of the quantum computation is read out by measuring the quantum system. While many proposals of quantum machine learning algorithms are still purely theoretical and require a full-scale universal quantum computer to be tested, others have been implemented on small-scale or special purpose quantum devices.

The Physics of Solar Energy Conversion Oct 19 2021 Research on advanced energy conversion devices such as solar cells has intensified in the last two decades. A broad landscape of candidate materials and devices were discovered and systematically studied for effective solar energy conversion and utilization. New concepts have emerged forming a rather powerful picture embracing the mechanisms and limitation to efficiencies of different types of devices. The Physics of Solar Energy Conversion introduces the main physico-chemical principles that govern the operation of energy devices for energy conversion and storage, with a detailed view of the principles of solar energy conversion using advanced materials. Key Features include: Highlights recent rapid advances with the discovery of perovskite solar cells and their development. Analyzes the properties of organic solar cells, lithium ion batteries, light emitting diodes and the semiconductor materials for hydrogen production by water splitting. Embraces concepts from nanostructured and highly disordered materials to lead halide perovskite solar cells Takes a broad perspective and comprehensively addresses the fundamentals so that the reader can apply these and assess future developments and technologies in the field. Introduces basic techniques and methods for understanding the materials and interfaces that compose operative energy devices such as solar cells and solar fuel converters.

Advances in Condensed-Matter and Materials Physics Apr 12 2021 This book, Condensed Matter and Material Physics, incorporates the work of multiple authors to enhance the theoretical as well as experimental knowledge of materials. The investigation of crystalline solids is a growing need in the electronics industry. Micro and nano transistors require an in-depth understanding of semiconductors of different groups. Amorphous materials, on the other hand, as non-equilibrium materials are widely applied in sensors and other medical and industrial applications. Superconducting magnets, composite materials, lasers, and many more applications are integral parts of our daily lives. Superfluids, liquid crystals, and polymers are undergoing active research throughout the world. Hence profound information on the nature and application of various materials is in demand. This book bestows on the reader a deep knowledge of physics behind the concepts, perspectives, characteristic properties, and prospects. The book was constructed using 10 contributions from experts in diversified fields of condensed matter and material physics and its technology from over 15 research institutes across the globe.

Statutes and Ordinances of the University of Cambridge 2015 Jun 22 2019 The official Statutes and Ordinances of the University of Cambridge.

Effective Field Theory in Particle Physics and Cosmology Mar 24 2022 The topic of the CVIII session of the Ecole de Physique des Houches, held in July 2017, was Effective Field Theory in Particle Physics and Cosmology. Effective Field Theory (EFT) is a general method for describing quantum systems with multiple length scales in a tractable fashion. It allows to perform

precise calculations in established models (such as the Standard Models of particle physics and cosmology), as well as to concisely parametrise possible effects from physics beyond the Standard Models. The goal of this school was to offer a broad introduction to the foundations and modern applications of Effective Field Theory in many of its incarnations. This is all the more important as there are preciously few textbooks covering the subject, none of them in a complete way. In this book, the lecturers present the concepts in a pedagogical way so that readers can adapt some of the latest developments to their own problems. The chapters cover almost all the lectures given at the school and will serve as an introduction to the topic and as a reference manual to students and researchers.

Advances in Neural Networks – ISNN 2015 Dec 29 2019 The volume LNCS 9377 constitutes the refereed proceedings of the 12th International Symposium on Neural Networks, ISNN 2015, held in Jeju, South Korea in October 2015. The 55 revised full papers presented were carefully reviewed and selected from 97 submissions. These papers cover many topics of neural network-related research including intelligent control, neurodynamic analysis, memristive neurodynamics, computer vision, signal processing, machine learning, and optimization.

Progress in Physics, vol. 4/2015 Oct 31 2022 The Journal on Advanced Studies in Theoretical and Experimental Physics, including Related Themes from Mathematics
Darwin's Medicine May 02 2020 Darwin's Medicine is the sequel to Brian D. Smith's influential and critically acclaimed *Future of Pharma* (Gower, 2011). Whereas the earlier book predicted the evolution of the pharmaceutical market and the business models of pharmaceutical companies, Darwin's Medicine goes much deeper into the drivers of industry change and how leading pharmaceutical and medical technology companies are adapting their strategies, structures and capabilities in practice. Through the lens of evolutionary science, Professor Smith explores the speculation of new business models in the Life Sciences Industry. This sophisticated and highly original approach offers insights into: The mechanisms of evolution in this exceptional industry; The six great technological and social shifts that are shaping its landscape; The emergence of 26 distinct, new business models; and The lessons that enable firms to direct and accelerate their own evolution. These insights map out the industry's complex, changing landscape and provide an invaluable guide to those firms seeking to survive and thrive in this dynamic market. The book is essential reading for anyone working in or studying the pharmaceutical, medical technology and related sectors. It provides a unique and novel way of making sense of the transformation we can see going on around us and a practical, focused approach to managing a firm's evolutionary trajectory.

BERRU Predictive Modeling Nov 07 2020 This book addresses the experimental calibration of best-estimate numerical simulation models. The results of measurements and computations are never exact. Therefore, knowing only the nominal values of experimentally measured or computed quantities is insufficient for applications, particularly since the respective experimental and computed nominal values seldom coincide. In the author's view, the objective of predictive modeling is to extract "best estimate" values for model parameters and predicted results, together with "best estimate" uncertainties for these parameters and results. To achieve this goal, predictive modeling combines precisely known experimental and computational data, which calls for reasoning on the basis of incomplete, error-rich, and occasionally discrepant information. The customary methods used for data assimilation combine experimental and computational information by minimizing an a priori, user-chosen, "cost functional" (usually a quadratic functional that represents the weighted errors between measured and computed responses). In contrast to these user-influenced methods, the BERRU (Best Estimate Results with Reduced Uncertainties) Predictive Modeling methodology developed by the author relies on the thermodynamics-based maximum entropy principle to eliminate the need for relying on minimizing user-chosen functionals, thus generalizing the "data adjustment" and/or the "4D-VAR" data assimilation procedures used in the geophysical sciences. The BERRU predictive modeling methodology also provides a "model validation metric" which quantifies the consistency (agreement/disagreement) between measurements and computations. This "model validation metric" (or "consistency indicator") is constructed from parameter covariance matrices, response covariance matrices (measured and computed), and response sensitivities to model parameters. Traditional methods for computing response sensitivities are hampered by the "curse of dimensionality," which makes them impractical for applications to large-scale systems that involve many imprecisely known parameters. Reducing the computational effort required for precisely calculating the response sensitivities is paramount, and the comprehensive adjoint sensitivity analysis methodology developed by the author shows great promise in this regard, as shown in this book. After discarding inconsistent data (if any) using the consistency indicator, the BERRU predictive modeling methodology provides best-estimate values for predicted parameters and responses along with best-estimate reduced uncertainties (i.e., smaller predicted standard deviations) for the predicted quantities. Applying the BERRU methodology yields optimal, experimentally validated, "best estimate" predictive modeling tools for designing new technologies and facilities, while also improving on existing ones.

2D Materials Jul 16 2021 A comprehensive and accessible introduction to 2D materials, covering basic physics, electronic and optical properties, and potential applications.

Selected Proceedings from the 231st ECS Meeting Sep 17 2021

Progress in Physics, vol. 2/2015 Sep 29 2022 The Journal on Advanced Studies in Theoretical and Experimental Physics, including Related Themes from Mathematics

Active Matter and Nonequilibrium Statistical Physics Jun 26 2022 From molecular motors to bacteria, from crawling cells to large animals, active entities are found at all scales in the biological world. Active matter encompasses systems whose individual constituents irreversibly dissipate energy to exert self-propelling forces on their environment. Over the past twenty years, scientists have managed to engineer synthetic active particles in the lab, paving the way towards smart active materials. This book gathers a pedagogical set of lecture notes that cover topics in nonequilibrium statistical mechanics and active matter. These lecture notes stem from the first summer school on Active Matter delivered at the Les Houches school of Physics. The lectures covered four main research directions: collective behaviours in active-matter systems, passive and active colloidal systems, biophysics and active matter, and nonequilibrium statistical physics—from passive to active.

Applied Physics, System Science and Computers III Feb 20 2022 This book reports on advanced theories and methods in three related fields of research: applied physics, system science and computers. The first part covers applied physics topics, such as lasers and accelerators; fluid dynamics, optics and spectroscopy, among others. It also addresses astrophysics, security, and medical and biological physics. The second part focuses on advances in computers, such as those in the area of social networks, games, internet of things, deep learning models and more. The third part is especially related to systems science, covering swarm intelligence, smart cities, complexity and more. Advances in and application of computer communication, artificial intelligence, data analysis, simulation and modeling are also addressed. The book offers a collection of contributions presented at the 3rd International Conference on Applied Physics, System Science and Computers (APSAC), held in Dubrovnik, Croatia on September 26–28, 2018. Besides presenting new methods, it is also intended to promote collaborations between different communities working on related topics at the interface between physics, computer science and engineering.

Techno-Economic Challenges of Green Ammonia as an Energy Vector Dec 09 2020 Techno-Economic Challenges of Green Ammonia as an Energy Vector presents the fundamentals, techno-economic challenges, applications, and state-of-the-art research in using green ammonia as a route toward the hydrogen economy. This book presents practical implications and case studies of a great variety of methods to recover stored energy from ammonia and use it for power, along with transport and heating applications, including its production, storage, transportation, regulations, public perception, and safety aspects. As a unique reference in this field, this book can be used both as a handbook by researchers and a source of background knowledge by graduate students developing technologies in the fields of hydrogen economy, hydrogen energy, and energy storage. Includes glossaries, case studies, practical concepts, and legal, public perception, and policy viewpoints that allow for thorough, practical understanding of the use of ammonia as energy carrier. Presents its content in a modular structure that can be used in sequence, as a handbook, in individual parts or as a field reference. Explores the use of ammonia, both as a medium for hydrogen storage and an energy vector unto itself.

New Uses of Micro and Nanomaterials Jan 10 2021 A fundamental part of modern technology is composed of devices that use special materials as main components. Since the last few decades of the last century and even more recently, a remarkable development has been achieved in new micro- and nanostructured materials with compositional structures and production methods that open unprecedented technological, economic, and ecological perspectives due to high yields, economies of scale, the possibility of reducing weight and size, and the low environmental impact of the equipment that contains them. This book offers a collection of excellent studies that use state-of-the-art methodologies developed by professional researchers from different countries in diverse areas of materials. In this way, this book is particularly useful to academics, scientists, practicing researchers, and postgraduate students whose work relates to the latest nanomaterial technologies.

Progress in Physics, vol. 1/2016 Oct 26 2019 The Journal on Advanced Studies in Theoretical and Experimental Physics, including Related Themes from Mathematics

Applied Nuclear Physics at Accelerators Jul 24 2019

Information and Randomness Aug 24 2019 The first edition of the monograph *Information and Randomness: An Algorithmic Perspective* by Cristian Calude was published in 1994. In my Foreword I said: "The research in algorithmic information theory is already some 30 years old. However, only the recent years have witnessed a really vigorous growth in this area. . . . The present book by Calude fits very well in our series. Much original research is presented. . . making the approach richer in consequences than the classical one. Remarkably, however, the text is so self-contained and coherent that the book may also serve as a textbook. All proofs are given in the book and, thus, it is not necessary to consult other sources for classroom instruction." The vigorous growth in the study of algorithmic information theory has continued during the past few years, which is clearly visible in the present second edition. Many new results, examples, exercises and open problems have been added. The additions include two entirely new chapters: "Computationally Enumerable Random Reals" and "Randomness and Incompleteness". The really comprehensive new bibliography makes the book very valuable for a researcher. The new results about the characterization of computably enumerable random reals, as well as the fascinating Omega Numbers, should contribute much to the value of the book as a textbook. The author has been directly involved in these results that have appeared in the prestigious journals *Nature*, *New Scientist* and *Pour la Science*.

Thorium—Energy for the Future Jan 28 2020 This book comprises selected proceedings of the ThEC15 conference. The book presents research findings on various facets of thorium energy, including exploration and mining, thermo-physical and chemical properties of fuels, reactor physics, challenges in fuel fabrication, thorium fuel cycles, thermal hydraulics and safety, material challenges, irradiation experiences, and issues and challenges for the design of advanced thorium fueled reactors. Thorium is more abundant than uranium and has the potential to provide energy to the world for centuries if used in a closed fuel cycle. As such, technologies for using thorium for power generation in nuclear reactors are being developed worldwide. Since there is a strong global thrust towards designing nuclear reactors with thorium-based fuel, this book will be of particular interest to nuclear scientists, reactor designers, regulators, academics and policymakers.

Computed Tomography - E-Book Aug 05 2020 Build the foundation necessary for the practice of CT scanning with *Computed Tomography: Physical Principles, Patient Care, Clinical Applications, and Quality Control*, 5th Edition. Written to meet the varied requirements of radiography students and practitioners, this two-color text provides comprehensive coverage of the physical principles of computed tomography and its clinical applications. The clear, straightforward approach is designed to improve your understanding of sectional anatomic images as they relate to computed tomography and facilitate communication between CT technologists and other medical personnel. Chapter outlines and chapter review questions help you focus your study time and master content. NEW! Three additional chapters reflect the latest industry CT standards in imaging: Radiation Awareness and Safety Campaigns in Computed Tomography, Patient Care Considerations, and Artificial Intelligence: An Overview of Applications in Health and Medical Imaging. UPDATED! More than 509 photos and line drawings visually clarify key concepts. UPDATED! The latest information keeps you up to date on advances in volume CT scanning; CT fluoroscopy; and multislice applications like 3-D imaging, CT angiography, and virtual reality imaging (endoscopy).

Introduction to Particle and Astroparticle Physics Mar 12 2021 This book, written by researchers who had been professionals in accelerator physics before becoming leaders of groups in astroparticle physics, introduces both fields in a balanced and elementary way, requiring only a basic knowledge of quantum mechanics on the part of the reader. The new profile of scientists in fundamental physics ideally involves the merging of knowledge in astroparticle and particle physics, but the duration of modern experiments is such that people cannot simultaneously be practitioners in both. *Introduction to Particle and Astroparticle Physics* is designed to bridge the gap between the fields. It can be used as a self-training book, a consultation book, or a textbook providing a "modern" approach to particles and fundamental interactions.

Oswaal Karnataka PUE Solved Papers II PUC Physics Book Chapterwise & Topicwise (For 2023 Exam) Nov 27 2019 • Latest Solved Paper with Scheme of Valuation-2022. • Strictly as per the latest syllabus, blueprint & design of the question paper. • All Typologies-Objective, VSA, SA & Essay Types Questions • Previous Years' Exam (2011-2022) Questions with Scheme of Valuation • NCERT Textbook Questions fully solved • PUE Question Bank Fully solved • Revision notes, Mind Maps & Concept videos for clarity of Concepts.

Physics of the Human Temporality Sep 05 2020 This book presents a novel account of the human temporal dimension called the "human temporality" and develops a special mathematical formalism for describing such an object as the human mind. One of the characteristic features of the human mind is its temporal extent. For objects of physical reality, only the present exists, which may be conceived as a point-like moment in time. In the human temporality, the past retained in the memory, the imaginary future, and the present coexist and are closely intertwined and impact one another. This book focuses on one of the fragments of the human temporality called the complex present. A detailed analysis of the classical and modern concepts has enabled the authors to put forward the idea of the multi-component structure of the present. For the concept of the complex present, the authors proposed a novel account that involves a qualitative description and a special mathematical formalism. This formalism takes into account human goal-oriented behavior and uncertainty in human perception. The present book can be interesting for theoreticians, physicists dealing with modeling systems where the human factor plays a crucial role, philosophers who are interested in applying philosophical concepts to constructing mathematical models, and psychologists whose research is related to modeling mental processes.

Yearbook of International Organizations 2014-2015 Jul 04 2020 Volume 3 allows readers to locate organizations by subjects or by fields of activity and specialization, and includes an index to Volumes 1 through 3.

Fractional Dynamics Apr 24 2022 The book is devoted to recent developments in the theory of fractional calculus and its applications. Particular attention is paid to the applicability of this currently popular research field in various branches of pure and applied mathematics. In particular, the book focuses on the more recent results in mathematical physics, engineering applications, theoretical and applied physics as quantum mechanics, signal analysis, and in those relevant research fields where nonlinear dynamics occurs and several tools of nonlinear analysis are required. Dynamical processes and dynamical systems of fractional order attract researchers from many areas of sciences and technologies, ranging from mathematics and physics to computer science.

Nanoplasmonics May 14 2021 Nanoplasmonics is a young topic of research, which is part of nanophotonics and nano-optics. Nanoplasmonics concerns to the investigation of electron oscillations in metallic nanostructures and nanoparticles. Surface plasmons have optical properties, which are very interesting. For instance, surface plasmons have the unique capacity to confine light at the nanoscale. Moreover, surface plasmons are very sensitive to the surrounding medium and the properties of the materials on which they propagate. In addition to the above, the surface plasmon resonances can be controlled by adjusting the size, shape, periodicity, and materials' nature. All these optical properties can enable a great number of applications, such as biosensors, optical modulators, photodetectors, and photovoltaic devices. This book is intended for a broad audience and provides an overview of some of the fundamental knowledges and applications of nanoplasmonics.

Time-Symmetry Breaking in Turbulent Multi-Particle Dispersion Jan 22 2022 This thesis presents experimental and theoretical investigations of the connection between the time asymmetry in the short-time evolution of particle clusters and the intrinsic irreversibility of turbulent flows due to the energy cascade. The term turbulence describes a special state of a continuous medium in which many interacting degrees of freedom are excited. One of the interesting phenomena observed in turbulent flows is their time irreversibility. When milk is stirred into coffee, for example, highly complex and interwoven structures are produced, making the mixing process irreversible. This behavior can be analyzed in more detail by studying the dispersion of particle clusters. Previous experimental and numerical studies on the time asymmetry in two-particle dispersion indicate that particles separate faster backwards than forwards in time, but no conclusive explanation has yet been provided. In this thesis, an experimental study on the short-time behavior of two- and four-particle dispersion in a turbulent water flow between two counter-rotating propellers is presented. A brief but rigorous theoretical analysis reveals that the observed time irreversibility is closely linked to the turbulence energy cascade. Additionally, it is demonstrated experimentally that the addition of minute amounts of polymers to the flow has a significant impact on multi-particle dispersion due to an alteration of the energy cascade.

The Cosmic Spacetime Oct 07 2020 The growth of cosmology into a precision science represents one of the most remarkable stories of the past century. Much has been written chronicling this development, but rarely has any of it focused on the most critical element of this work—the cosmic spacetime itself. Addressing this lacuna is the principal focus of this book, documenting the growing body of evidence compelling us—not only to use this famous solution to Einstein's equations in order to refine the current paradigm, but—to probe its foundation at a much deeper level. Its excursion from the smallest to largest possible scales insightfully reveals an emerging link between the Universe we behold and the established tenets of our most fundamental physical theories. Key Features: Uncovers the critical link between the Local Flatness Theorem in general relativity and the symmetries informing the spacetime's metric coefficients Develops a physical explanation for some of the most unpalatable coincidences in cosmology Provides a sober assessment of the horizon problems precluding our full understanding of the early Universe Reveals a possible explanation for the origin of rest-mass energy in Einstein's theory In spite of its technical layout, this book does not shy away from introducing the principal players who have made the most enduring contributions to this field. Anyone with a graduate level foundation in physics and astronomy will be able to easily follow its contents.

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