

Blueshift

Formatted as a series of interviews with noted researchers in the field, this book reviews the history of quasar research and describes how advances in instrumentation and computation have aided quasar astronomy and changed our basic understanding of quasars.

Due to the recent discovery of the room-temperature visible light emission from porous silicon (P-Si), a great interest in P-Si and related materials has arisen in the last decade of the 20th century. Crystalline (c-) Si, at the heart of integrated circuits, has an indirect band gap of 1.1 eV, which limits its application in optoelectronics. The visible light emitting P-Si may open a new field combining Si integrated technology and optoelectronics. This book is a comprehensive review of the recent research and development of porous silicon. Strong visible photoluminescence (PL) and electroluminescence (EL) from P-Si and other forms of silicon nanocrystallites (nc-Si) are reviewed. Several proposed mechanisms for the PL from porous silicon such as quantum confinement, amorphicity and molecular PL are studied. The following issues are covered: mechanisms for the visible light emission, physical structures, studies of the PL and EL, correlation of structure and optical studies, surface physics and chemistry, relationships among various forms (P-Si, a-Si, μ c-Si), device applications, future developments.

A metaphysical science fiction romance novel

The title of this book, *Advances in Optical and Photonic Devices*, encompasses a broad range of theory and applications which are of interest for diverse classes of optical and photonic devices. Unquestionably, recent successful achievements in modern optical communications and multifunctional systems have been accomplished based on composing “building blocks” of a variety of optical and photonic devices. Thus, the grasp of current trends and needs in device technology would be useful for further development of such a range of relative applications. The book is going to be a collection of contemporary researches and developments of various devices and structures in the area of optics and photonics. It is composed of 17 excellent chapters covering fundamental theory, physical operation mechanisms, fabrication and measurement techniques, and application examples. Besides, it contains comprehensive reviews of recent trends and advancements in the field. First six chapters are especially focused on diverse aspects of recent developments of lasers and related technologies, while the later chapters deal with various optical and photonic devices including waveguides, filters, oscillators, isolators, photodiodes, photomultipliers, microcavities, and so on. Although the book is a collected edition of specific technological issues, I strongly believe that the readers can obtain generous and overall ideas and knowledge of the state-of-the-art technologies in optical and photonic devices. Lastly, special words of thanks should go to all the scientists and engineers who have devoted a great deal of time to writing excellent chapters in this book.

Through the ages, mankind has looked to the night sky with solemn awe and persistent bewilderment. Who are we? Why are we here? Why does anything exist? How have we come to be self-aware? In recent times, physicists have produced a stream of

astounding revelations into the history and design of the physical universe. For several millennia, spiritual traditions have prayerfully contemplated these cosmic puzzles, while the hearts of poets have sung to the sheer wonder of it all. With reverence, humor, and a singular voice, poet Matthew Galbraith engages these timeless mysteries in a collection of heartfelt and meticulously crafted poetry. He presents four thematic groups that span a broad range of issues about life on Earth and beyond. As a man of faith with a deep appreciation of scientific inquiry, Galbraith offers a unique, global perspective poured forth in a waterfall of sensual sound, alluring rhythms, and surrealistic imagery. Blueshift unveils a collection of melodic, mystical, and thought-provoking verse that provides a one-of-a-kind adventure into a vibrant poetic landscape.

The first aliens to arrive on planet Earth were the Dorts. They were amoebalike and frighteningly large, but they did favor us with the Theory of Transformation a brilliant advance over prior attempts by theoretical and particle physicists to create the ultimate, Unified Theory of Everything; but like all great theories, even theirs had limitations. Centuries after the first Dorts arrived, Laura Shane was born. She reinterpreted the Dort Theory by giving it the finishing touch of her genius. It led to the faster than light removal of miles-deep, cone-shaped plugs from planet Earth. The latest and largest such Cone carried a crew of thousands. It was named the Great Cone of Transformation. Through his 3T Corporation, Ned Keller directed the creation of Cones. Despite Lauras unease about her first voyage into space, she and Ned went together on the Great Cones maiden mission. Two weeks later they were light years from home when Neds boss, Jack Lewis, arrived to inform them of an event on Earth with implications for their mission. Unfortunately his concern did not include awareness of what those implications might be; but they were already in peril. It was sabotagethe first in a series of calamities. Before the final calamity began to close in on them (the Big Rip, set to destroy the entire local multiverse) and before Jacks recent arrival, it was still teatime on the Great Cone. Laura and Ned were having a pleasant morning beside her pool. The story begins there, with our attractive young genius sipping tea and deep in thought about her bewildering circumstances and the unchanged perception of all the things around her. Ned was reading comfortably in a nearby lounge chair. Now and then hed look up to speak of love, while shamelessly admiring her long and lovely legs.

Contents:Materials and Related Physics: Magnetic Field and Dimensionality Induced Population Effects in HgSe and HgSe:Fe (O Portugall et al)Growth and in Situ Scanning Tunneling Microscopy Studies of IV–VI Semiconductors (Abstract) (G Springholz)Detectors and Arrays: China's Satellite Project for Earth Observation and Infrared Detection (D-B Kuang)Recent Progress in Quantum Well Infrared Photodetectors and Focal Plane Arrays for LWIR Imaging Applications (S S Li)Infrared Lasers: Mid-Infrared Resonant-Cavity-Based Devices: Of Detectors and Emitters (J Bleuse et al)W Lasers for the Mid-IR (J R Meyer et al)Devices and Related Physics: Optoelectronic Devices from Indium Aluminium Antimonide and Mercury Cadmium Telluride (T Ashley)Three-Terminal Superconductor–Semiconductor Devices (H Takayanagi & T Akazaki)Physics: Coherent Anti-Stokes Raman Scattering in Diluted Magnetic IV–VI Epilayers and Superlattices (H Pascher et al)High Field Cyclotron Resonance in GaSb and Effective Mass at the Γ and L-Points (H Arimoto et al)Quantum Dots: Growth and Characterization of InAs Quantum Dots (N N Ledentsov)Self-Assembled InAs Quantum Boxes: Growth, Intrinsic Properties, Potential Applications (Abstract) (J M

Gérard)and other papers Readership: Researchers in the field of semiconductors.

"We're just kids after all. What kind of trouble can we get into?" Justice, fairness, friendship, and curiosity. That's the motto of the Heroic Commission. Unfortunately, the heroes aren't coming to save the day, and it's up to Becky Blueshift and her friends to save them. Becky's parents are stuck between dimensions, her little brother has made a mess of their starship, and her best friend just wants to go home. Too bad in space, no one can hear you complain. Danger and death lie around every corner, but none of it is as scary as Becky's fear of failure. Join the adventure as Becky, Edison, and Ben face pirates, monsters, and their own fears in a race to save their parents...and the entire universe!

A comprehensive guide to a new technology for enabling high-performance spectroscopy and laser sources Resonance Enhancement in Laser-Produced Plasmas offers a guide to the most recent findings in the newly emerged field of resonance-enhanced high-order harmonic generation using the laser pulses propagating through the narrow and extended laser-produced plasma plumes. The author—a noted expert in the field—presents an introduction and the theory that underpin the roles of resonances in harmonic generation. The book also contains a review of the most advanced methods of plasma harmonics generation at the conditions of coincidence of some harmonics, autoionizing states, and some ionic transitions possessing strong oscillator strengths. Comprehensive in scope, this text clearly demonstrates the importance of resonance-enhanced nonlinear optical effects leading to formation of efficient sources of coherent extreme ultraviolet radiation that can be practically applied. This important resource: Puts the focuses on novel applications of laser-plasma physics, such as the development of ultrashort-wavelength coherent light sources Details both the theoretical and experimental aspects of higher-order harmonic generation in laser-produced plasmas Contains information on early studies of resonance enhancement of harmonics in metal-ablated plasmas Analyzes the drawbacks of different theories of resonant high order harmonic generation Includes a discussion of the quasi-phase-matching and properties of semiconductor plasmas Written for researchers and students in the fields of physics, materials science, and electrical engineering who are interested in laser physics and optics, Resonance Enhancement in Laser-Produced Plasmas offers an introduction to the topic and covers recent experimental studies of various resonance processes in plasmas leading to enhancement of single harmonic.

This volume contains papers on the following: CMOS devices and devices based on compound semiconductors; processing; silicon integrated technology and integrated circuit design; quantum physics; nanotechnology; nanodevices, sensors and microsystems. The latest news and future challenges in these fields are presented in invited papers.

The crew of the Clarke may just be humanity's last hope. Sent to investigate an alien construction in the asteroid belt, they're hoping to make discoveries, establish first contact, and—though it's a long shot—stay alive for as long as they can. They all came aboard knowing it would be a one-way trip. So what propelled them to sign up? For some, it was a choice. For others, it was a chance. Learn the extraordinary story about how the crew of the Clarke came together, featuring one-shots by guest artists Joëlle Jones, Drew Moss, Ryan Kelly, and Alise Glušková, as well as the origins of the mysterious Builders, from guest artist Langdon

Foss.

If you could be the first to lay eyes upon a planet orbiting a distant star, would you go? If it meant that when you returned home-if you returned home-everyone you knew would have been dead for centuries, would you still go? The members of the Polaris Project knew what they were giving up when they volunteered to fly to the star named Angel-21, but the allure of being the first explorers to leave the Solar System far outweighed the risks. As it turned out, the most dangerous thing they faced wasn't the mission ... it was the homecoming. Eight hundred years have passed and Earth is nothing like they thought it would be. As Commander Markus Brentwood scrambles to uncover the mystery of what's happened to Earth in their absence, he also must contend with an increasingly dysfunctional crew and a damaged ship that's flying on borrowed time. What should have been a joyous return home after a long, hard mission has turned into a race to see which nightmare would kill them first. Blueshift is an all new sci-fi adventure from Joshua Dalzelle, author of the bestselling Omega Force Series and Black Fleet Saga.

Winner of the Gival Press Novel Award When a prisoner in an unnamed labor camp finds his journal of memories taken from his cell, he sets out to console himself and perhaps find in his past a way to reclaim his freedom by again writing down what he can remember. As the prisoner writes and passes through the vivid world of a distant life, he is eventually confronted by a strange memory that, if true, questions the reliability of his memories and whether what he remembers was really his own life or, somehow, someone else's.

This handbook addresses the development of energy-efficient, environmentally friendly solid-state light sources, in particular semiconductor light emitting diodes (LEDs) and other solid-state lighting devices. It reflects the vast growth of this field and impacts in diverse industries, from lighting to communications, biotechnology, imaging, and medicine. The chapters include coverage of nanoscale processing, fabrication of LEDs, light diodes, photodetectors and nanodevices, characterization techniques, application, and recent advances. Readers will obtain an understanding of the key properties of solid-state lighting and LED devices, an overview of current technologies, and appreciation for the challenges remaining. The handbook will be useful to material growers and evaluators, device design and processing engineers, newcomers, students, and professionals in the field. Now enhanced by new end-of-chapter material in the MindTap online homework system, this new Hybrid version of Mike Seeds', Dana Backman's, and Michele Montgomery's best-selling HORIZONS: EXPLORING THE UNIVERSE, Enhanced Thirteenth Edition, engages students by focusing on two central questions: How Do We Know? which emphasizes the role of evidence in the scientific process, providing insights into how science works; and What Are We? which highlights our place as planet dwellers in an evolving universe, guiding students to ask questions about where we came from and how we formed a perspective that the study of astronomy is uniquely positioned to emphasize. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version. Almost from its inception, Einstein's general theory of relativity was known to sanction spacetime models harboring

singularities. Until the 1960s, however, spacetime singularities were thought to be artifacts of the idealizations of the models. This attitude evaporated in the face of a series of theorems, due largely to Stephen Hawking and Roger Penrose, which showed that Einstein's general theory implies that singularities can be expected to occur in a wide variety of conditions in both gravitational collapse and in cosmology. In the light of these results some physicists adopted the attitude that, since spacetime singularities are intolerable, general relativity contains within itself the seeds of its own destruction. Others hoped that peaceful coexistence with singularities could be achieved by proving a form of Roger Penrose's cosmic censorship hypothesis, which would place singularities safely inside black holes. Whatever the attitude one adopts toward spacetime singularities, it is evident that they raise a number of foundational problems for physics and have profound implications for the philosophy of space and time. However, philosophers of science have been slow to awaken to the significance of these developments. Indeed, this is the first serious book-length study of the subject by a philosopher of science. It features an overview of the literature on singularities, as well as an analytic commentary on their significance to a number of scientific and philosophical issues.

The past decade has seen the development of the operational understanding of fundamental interactions within the standard model. This has detoured our attention from the great enigmas posed by the dynamics and collective behavior of strongly interacting particles. Discovered more than 30 years ago, the thermal nature of the hadronic particle spectra has stimulated considerable theoretical effort, which so far has failed to 'confirm' on the basis of microscopic interactions the origins of this phenomenon. However, a highly successful Statistical Bootstrap Model was developed by Rolf Hagedorn at CERN about 30 years ago, which has led us to consider the 'boiling hadronic matter' as a transient state in the transformation of hadronic particles into their melted form which we call Quark-Gluon-Plasma (QGP). Today, we return to seek detailed understanding of the thermalization processes of hadronic matter, equipped on the theoretical side with the knowledge of the fundamental strong interaction theory, the quantum chromo-dynamics (QCD), and recognizing the important role of the complex QCD-vacuum structure. On the other side, we have developed new experimental tools in the form of nuclear relativistic beams, which allow to create rather extended regions in space-time of Hot Hadronic Matter. The confluence of these new and recent developments in theory and experiment led us to gather together from June 27 to July 1, 1994, at the Grand Hotel in Divonne-les-Bains, France, to discuss and expose the open questions and issues in our field.

2187: Earth is cold, dead and divided. The rich hide away while the rest will do anything to survive. Humanity have only one hope: crossing hostile alien territory to reach a habitable planet. It's lucky that for some, fighting their way through space is just a way of life . . . Jinnifer Blue is on the run. An expert pilot, she apprehends criminals on behalf of the

government and keeps her illegal genetic modifications a closely guarded secret. But when a particularly dangerous job goes south, Jinn is left stranded on a prison ship with one of the most ruthless criminals in the galaxy. Now she must decide if she can trust her co-prisoner - because once they discover what the prison ship is hiding, she definitely can't trust anyone else . . . A gripping space adventure for fans of Elizabeth Moon and Rachel Bach

WHAT READERS ARE SAYING ABOUT THE SECOND SPECIES SERIES: 'I was addicted from the first page! An intriguing story line with interesting characters and a different view of the future and of space travel.' Amazon reviewer 'This is one fabulous Sci-Fi story with a brilliantly well realised futuristic world' Reading Revelations 'I just had seen the Last Jedi when I read this and was looking to read something that had similarly strong female characters, this didn't disappoint. I read it within a day because each chapter left me desperate to find out what happened next. It's sexy, action packed and it was easy to get sucked into the world created.' Amazon reviewer 'A thrilling adult sci-fi adventure set in 2187 with a backdrop of a dying earth, space travel, aliens, technology and fabulous space pirates. The cast of characters are an eclectic mix of personalities with questionable morals, hang-ups and conflicts that are brought to life with vibrant description, thrilling action and humour.' Amazon reviewer

Why would two talented and employable young graphic designers start up their own practice without any clients, in the midst of a recession, and in a city brimming with world-renowned designers? Karlssonwilker inc.'s tellmewhy is the improbable story of such a venture -- or act of bravura or insanity -- on the part of Hjalti Karlsson and Jan Wilker, and offers a telling, humorous, and always human insight into the workings of a young startup design studio, showcasing every single project they did in their first two years. A book as iconoclastic as their designs, tellmewhy features fresh stories of karlssonwilker's ordinary office life and its less-than-romantic tales about rooftop parties, battles with immigration, language obstacles, missed meetings, and money problems. Despite these stories -- and because of others -- karlssonwilker has produced an impressive body of work in two short years. Tellmewhy shows the happy endings, including signage for a Philadelphia restaurant, logo designs for a New York fashion house, and CD packaging for both independent and major music labels. And it presents the few unrealized designs, like an ad campaign for a TV network. All share the designers' creative and humorous take on design. Karlssonwilker intersperses these examples with its singular illustrated diagrams, faux flow charts linking the partners' biographies, work, social lives, and whatever comes to their unique minds. Tellmewhy offers both inspiration and caution for designers everywhere. A foreword by former employer Stefan Sagmeister recalls karlssonwilker's start in his design office.

Relativity theory has become one of the icons of Twentieth Century science. It's reckoned to be a difficult subject, taught as a layered series of increasingly difficult mathematics and increasingly abstract concepts. We're told that relativity

theory is supposed to be this complicated and counter-intuitive. But how much of this historical complexity is really necessary? Can we bypass the interpretations and paradoxes and pseudoparadoxes of Einstein's special theory and jump directly to a deeper and more intuitive description of reality? What if curvature is a fundamental part of physics, and a final theory of relativity shouldn't reduce to Einstein's "flat" 1905 theory //on principle//? "Relativity..." takes us on a whistlestop tour of Twentieth Century physics - from black holes, quantum mechanics, wormholes and the Big Bang to the workings of the human mind, and asks: what would physics look like without special relativity? 394 printed pages, 234156 mm, ~200 figures and illustrations, includes bibliography and index www.relativitybook.com

A wealth of new experimental and theoretical results has been obtained in solar physics since the first edition of this textbook appeared in 1989. Thus all nine chapters have been thoroughly revised, and about 100 pages and many new illustrations have been added to the text. The additions include element diffusion in the solar interior, the recent neutrino experiments, methods of image restoration, observational devices used for spectroscopy and polarimetry, and new developments in helioseismology and numerical simulation. The book takes particular advantage of the results of several recent space missions, which lead to substantial progress in our understanding of the Sun, from the deep interior to the corona and solar wind.

We focused on cutting-edge science and technology of Nanocrystals in this book. "Nanocrystal" is expected to lead to the creation of new materials with revolutionary properties and functions. It will open up fresh possibilities for the solution to the environmental problems and energy problems. We wish that this book contributes to bequeath a beautiful environment and valuable resources to subsequent generations. This work covers principles of Raman theory, analysis, instrumentation, and measurement, specifying up-to-the-minute benefits of Raman spectroscopy in a variety of industrial and academic fields, and how to cultivate growth in new disciplines. It contains case studies that illustrate current techniques in data extraction and analysis, as well as over 500 drawings and photographs that clarify and reinforce critical text material. The authors discuss Raman spectra of gases; Raman spectroscopy applied to crystals, applications to gemology, in vivo Raman spectroscopy, applications in forensic science, and collectivity of vibrational modes, among many other topics.

Mood swings lingering in the less pleasant sector. Reflections on failed dreams of youth, drugs and booze, lovesickness, historical injustice and other hardships a restless mind can encounter. A semi-concept poetry book written in rhyme, blank verse and free verse.

This book addresses graduate students in the first place and is meant as a modern compendium to the existing texts on black hole astrophysics. The authors present in pedagogically written articles our present knowledge on black holes covering mathematical models including numerical aspects and physics and astronomical observations as well. In addition, in their write-up of a panel discussion the participants of the school address the existence of black holes consenting that it has by now been verified with certainty.

This book describes the physics behind the optical properties of plasmonic nanostructures focusing on chiral aspects. It explains in detail how the geometry determines chiral near-fields and how to tailor their shape and strength. Electromagnetic fields with strong optical chirality interact strongly with chiral molecules and, therefore, can be used for enhancing the sensitivity of chiroptical spectroscopy techniques.

Besides a short review of the latest results in the field of plasmonically enhanced enantiomer discrimination, this book introduces the concept of chiral plasmonic near-field sources for enhanced chiroptical spectroscopy. The discussion of the fundamental properties of these light sources provides the theoretical basis for further optimizations and is of interest for researchers at the intersection of nano-optics, plasmonics and stereochemistry.

Fascinating, engaging, and extremely visual, Foundations of Astronomy Twelfth Edition emphasizes the scientific method throughout as it guides students to answer two fundamental questions: What are we? And how do we know? Updated with the newest developments and latest discoveries in the exciting study of astronomy, authors Michael Seeds and Dana Backman discuss the interplay between evidence and hypothesis, while providing not only fact but also a conceptual framework for understanding the logic of science. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

Albert Einstein is often viewed as the icon of genius, and his theories are admired for their beauty and correctness. Yet the final judge of any theory is the rigorous test of experiment, not the fame of its inventor or the allure of its mathematics. For decades, general relativity has passed test after test with flying colors, including some remarkable new tests using the recently detected gravitational waves. Still, there are reasons for doubt. Einstein's theory of gravity, as beautiful as it is, seems to be in direct contradiction with another theory he helped create: quantum mechanics. Until recently, this was considered to be a purely academic affair. But as more and more data pour in from the most distant corners of the universe, hinting at bizarre stuff called "dark energy" and "dark matter," some scientists have begun to explore the possibility that Einstein's theory may not provide a complete picture of the cosmos. This book chronicles the latest adventures of scientists as they put Einstein's theory to the test in ever more precise and astonishing ways, and in ever more extreme situations, when gravity is unfathomably intense and rapidly churning. From the explosions of neutron stars and the collisions of black holes to the modern scientific process as a means to seek truth and understanding in the cosmos, this book takes the reader on a journey of learning and discovery that has been 100 years in the making.

Redshift, Blueshift Gival Press

Poems and Pictures from Hospitals, Schools, Grocery Stores, and Homes which were made during the Pandemic of 2020.

This book examines the methods of two potential paths to truth, science (physics) and religion (Christianity). Both contain inherent limitations. Scientists often regard Christians as naïve because they accept subjective facts. Christians regard materialists as blinded by narrow vision. These and other issues in histories of science and Christianity are comparatively examined to discover the most reliable method for identifying truth. Comparative criticism provides deeper insights into both methods rather than a study of each by itself.

The MRS Symposium Proceeding series is an internationally recognised reference suitable for researchers and practitioners.

Poetry. In an unbroken poem of heat and breadth, Polkinhorn explores the phenomena of blue shifting, or inescapable convergence. With an urgency that is at once sprawling and specific, Polkinhorn draws us back towards our own lives -- forcing us into their rapid intersections and tight corners. It is ferociously driven. Take a big breath and buckle yourself in for the ride -- nowhere you// Can imagine yet their guiltless movements utterly/ Charm you a frisson of recognition the thin// Light a flickering

haze and hints of people you/ May have known whose insubstantial forms// Or the abortion that eliminated its chance/ Still barring your way until dawn/ Which will return with its load of cold to be offered/ Up your forearms thigh-bones to keep the channel// Open but whose infancy or vaunted genealogy/ Like a rogue phenotype if you pay strict attention. Harry Polkinhorn is an experimental poet/artist, translator, and editor whose works have been exhibited and published worldwide.

Nanotechnology is a 'catch-all' description of activities at the level of atoms and molecules that have applications in the real world. A nanometer is a billionth of a meter, about 1/80,000 of the diameter of a human hair, or 10 times the diameter of a hydrogen atom. Nanotechnology is now used in precision engineering, new materials development as well as in electronics; electromechanical systems as well as mainstream biomedical applications in areas such as gene therapy, drug delivery and novel drug discovery techniques. This book presents the latest research in this frontier field. Contents: Preface; Electrospinning: A Novel Method for Metal Oxide Fibres; Nanofocusing Probe Optimisation in a Near-Field Head for an Ultra-High Density Optical Memory; Molecular Dynamics Simulation of Metallic Nanocluster Interfaces; Pre- and Post-Breakdown Conduction of Thin SiO₂ Gate Oxides of MOS Devices: A Conductive Atomic Force Microscope Study; Topographic and Electrical Characterisation of Afm-Grown SiO₂ on Si; Solvothermal Route used to Synthesize BN Nanocrystals and the Catalytic Effect of BN Nanocrystals; Covalently Attached Multilayer Self-Assembly Films and Micropatterns Comprising Metal

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