Reminiscences Of Ahmed H Zewail Photons Electrons

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Silicon - Paul Siffert 2013-03-09
With topics ranging from epitaxy through lattice defects and doping to quantum computation, this book provides a personalized survey of the development and use of silicon, the basis for the revolutionary changes in our lives sometimes called "The Silicon Age." Beginning with the very first developments more than 50 years ago, this reports on all aspects of silicon and silicon technology up to its use in exciting new technologies, including a glance at possible future developments.
About Science, Myself and Others - V.L. Ginzburg 2004-10-31
In About Science, Myself and Others, Vitaly Lazarevich Ginzburg, co-recipient of the 2003 Nobel Prize in Physics and Editor of the review journal Physics-Uspekhi, provides an insight into modern physics, the lives and works of other prominent physicists he has known, and insight into his own life and views on physics and beyond. Divided into three parts, the book starts with a review of the key problems in contemporary physics, astrophysics, and cosmology, examining their historical development and why they pose such a challenge to today's physicists and for society. Part One also includes details of some of Professor Ginzburg's work, including superconductivity and superfluidity. Part Two encompasses several articles on the lives and works of several prominent physicists, including the author. The third part is a collection of articles that provide a personal view of the author, describing his personal views and recollections on a range of wider topics. Taken together, this collection of articles creates an enjoyable review of physics, its philosophy, and key players in its modern development in the 20th Century. Undoubtedly, it will be an enjoyable read for professional physicists and non-scientists alike.
Beyond the Molecular Frontier - National Research Council 2003-03-19
Chemistry and chemical engineering have changed significantly in the last decade. They have broadened their scopeâ€"into biology, nanotechnology, materials science, computation, and advanced methods of process systems engineering and controlâ€"so much that the programs in most chemistry and chemical engineering departments now barely resemble the classical notion of chemistry. Beyond the Molecular Frontier brings together research, discovery, and invention across the entire spectrum of the chemical sciencesâ€"from fundamental, molecular-level chemistry to large-scale chemical processing technology. This reflects the way the field has evolved, the synergy at universities between research and education in chemistry and chemical engineering, and the way chemists and chemical engineers work together in industry. The astonishing developments in science and engineering during the

20th century have made it possible to dream of new goals that might previously have been considered unthinkable. This book identifies the key opportunities and challenges for the chemical sciences, from basic research to societal needs and from terrorism defense to environmental protection, and it looks at the ways in which chemists and chemical engineers can work together to contribute to an improved future.

Reminiscences of Ahmed H. Zewail - Ahmed H. Zewail 2018

The Nobel Prize - Burton Feldman 2000

A history of the Nobel Prize reveals the biases and controversies inherent in the choosing of award winners in each field, scandals, corruption, and the problems stemming from a refusal to change with modern times.

Transmission Electron Microscopy - C. Barry Carter 2016-08-24

This text is a companion volume to Transmission Electron Microscopy: A Textbook for Materials Science by Williams and Carter. The aim is to extend the discussion of certain topics that are either rapidly changing at this time or that would benefit from more detailed discussion than space allowed in the primary text. World-renowned researchers have contributed chapters in their area of expertise, and the editors have carefully prepared these chapters to provide a uniform tone and treatment for this exciting material. The book features an unparalleled collection of color figures showcasing the quality and variety of chemical data that can be obtained from today’s instruments, as well as key pitfalls to avoid. As with the previous TEM text, each chapter contains two sets of questions, one for self assessment and a second more suitable for homework assignments. Throughout the book, the style follows that of Williams & Carter even when the subject matter becomes challenging—the aim is always to make the topic understandable by first-year graduate students and others who are working in the field of Materials Science Topics covered include sources, in-situ experiments, electron diffraction, Digital Micrograph, waves and holography, focal-series reconstruction and direct methods, STEM and tomography, energy-filtered TEM (EFTEM) imaging, and spectrum imaging. The range and depth of material makes this companion volume essential reading for the budding microscopist and a key reference for practicing researchers using these and related techniques.

Linus Pauling - Clifford Mead 2008-03-01

One of the most brilliant scientists and most controversial individuals of the twentieth century, Linus Pauling was the only person to win two unshared Nobel Prizes. This unique volume, first published to mark the centenary of Pauling's birth, gathers his words and those of his contemporaries and students, together with photographs, drawings, and reproductions from the Pauling Papers. Pauling (1901-1994) was known for being outspoken and for leaping over scientific boundariesfrom physics to chemistry to biology to medical research. This collection draws a vivid portrait of a remarkable man'scientist, humanist, and activist?highlighting his larger-than-life personality and his singular achievements. As both scientist and citizen, Pauling was passionate and deeply thoughtful. He wrote The Nature of the Chemical Bond, one of the most cited sources in scientific history, and won the Nobel Prize in Chemistry in 1954. He risked his reputation during the McCarthy years as a vocal opponent of Cold War policies and nuclear proliferation. As a result, he was vilified by the press, investigated by the FBI, and awarded the 1962 Nobel Peace Prize.In the 1970s, Pauling again gained international recognition, this time for his advocacy of megadoses of vitamin C as a cure for cancer and cold prevention.

Spinach On The Ceiling: The Multifaceted Life Of A Theoretical Chemist - Martin Karplus 2020-06-22

'Karplus's tales of a turbulent graduate school experience at Caltech will inspire readers to muster fortitude when everything seems to be spinning out of control. Karplus balances rigorous scientific discussions with refreshing chapters expounding his passion for photography and gastronomy.'Nature Chemistry, May 2020Nobel Laureate Martin Karplus was eight when his family fled Nazi-occupied Austria via Switzerland and France for the United States. He would later credit his life as a refugee as a decisive influence on his world view and approach to science.Spinach on the Ceiling is an autobiographical telling of Karplus' life story, and how it led him to win the Nobel Prize in Chemistry in 2013.

The book captures pivotal moments in Martin's life — from his escape to Switzerland in 1938 shortly after Hitler's entrance into Austria; to memorable moments like when his parents gave him a microscope which opened his eyes to the wonders of science; to his education in New England and California; and his eventual scientific career which took him to England, Illinois, Columbia, Strasbourg, and Harvard. It relates how Martin's optimistic outlook and belief in his vision made it possible for him to overcome setbacks in his life, and turn a subject of study his colleagues considered a waste of time into a central part of chemistry and structural biology. It is his hope to inspire and aid young readers, in particular, to have a successful trajectory in their own lives. Although research and teaching have been his primary focus, he has traveled the world photographing people and places with a Leica IIIC and has had numerous exhibitions of the photographs. He has also enjoyed a lifelong interest in cooking and worked in some of the best restaurants in France and Spain.

Cosmic Anger - Gordon Fraser 2008-04-24

This book presents a biography of Abdus Salam, the first Muslim to win a Nobel Prize for Science (Physics 1979), who was nevertheless excommunicated and branded as a heretic in his own country. His achievements are often overlooked, even besmirched. Realizing that the whole world had to be his stage, he pioneered the International Centre for Theoretical Physics in Trieste, a vital focus of Third World science which remains as his monument. A staunch Muslim, he was ashamed of the decline of science in the heritage of Islam, and struggled doggedly to restore it to its former glory. Undermined by his excommunication, these valiant efforts were doomed.

Personal And Scientific Reminiscences: Tributes To Ahmed Zewail - Thomas John Meurig 2017-08-04

Physical Biology - Ahmed H. Zewail 2008

Addresses significant problems in physical biology and adjacent disciplines. This volume provides a perspective on the methods and concepts at the heart of chemical and biological behavior, covering the topics of visualization; theory and computation for complexity; and macromolecular function, protein folding, and protein misfolding

Understanding the Universe - Manjunath.R 2020-03-17

We human beings — who are ourselves mere collections of fundamental particles of nature — try to wonder, seek answers and gazing at the immense heavens above, we have always asked a multitude of questions: When did the first black holes form in pre-galactic halos and what is their initial mass and spin? What is the mechanism of black hole formation in galactic nuclei, and how do black holes evolve over cosmic time due to accretion and mergers? What is the role of black hole mergers in galaxy formation? Does gravity travel at the speed of light? Does the graviton have mass? How does gravitational information propagate: Are there more than two transverse modes of propagation? What is the structure of space-time just outside astrophysical black holes? Do their space times have horizons? What happens in a black hole? Many others! Understanding the Universe: Quarks, Leptons and the Big Bang is a clear, readable and self-contained introduction to chaos of physics and related areas of science. It bridges the gap and addresses the questions that are of interest to us all or at least to all of us reading this book and lead us to study science in the first place. This book concentrates on presenting the subject from the understanding perspective of physics and brings the reader right up to date with curious aspects of physics established over the last few centuries. This book assumes science a journey not a destination and the advance of knowledge is an infinite progression towards a goal that forever recedes. This book will be of interest to students, teachers and general science readers interested in fundamental ideas of physics.

Beyond Bias and Barriers - Institute of Medicine 2007-05-04

The United States economy relies on the productivity, entrepreneurship, and creativity of its people. To maintain its scientific and engineering leadership amid increasing economic and educational globalization, the United States must aggressively pursue the innovative capacity of all its people—women and men. However, women face barriers to success in every field of science and engineering; obstacles that deprive the country

of an important source of talent. Without a transformation of academic institutions to tackle such barriers, the future vitality of the U.S. research base and economy are in jeopardy. Beyond Bias and Barriers explains that eliminating gender bias in academia requires immediate overarching reform, including decisive action by university administrators, professional societies, federal funding agencies and foundations, government agencies, and Congress. If implemented and coordinated across public, private, and government sectors, the recommended actions will help to improve workplace environments for all employees while strengthening the foundations of America's competitiveness.

U.S. Scientists and Engineers - 1988

Reminiscences Of Ahmed H.zewail: Photons, Electrons And What Else? - A Portrait From Close Range. Remembrances Of His Group Members And Family - Dongping Zhong 2018-02-09

In this unique illustrated book, PhD students, postdoctoral researchers, senior visiting scholars, and staff describe their personal experiences in working with the late Prof. Ahmed H. Zewail at Caltech. Their reminiscences provide snapshots of their rich interactions, reflecting the great scientific achievements, as well as the human and humorous sides of Ahmed H. Zewail.The contributors tell us their stories covering a period of forty years, beginning from the time of Zewail's arrival at Caltech in 1976. Some of them cover the time when Zewail was starting his pioneering work on femtochemistry at the end of 80's, while others relate events long after he was awarded the Nobel Prize in Chemistry (1999) and had embarked on a new career in ultrafast electron imaging. The aims and scope of this book is to provide both scientists and non-scientists descriptions of the experiences of scientists in the early or mature stages of their careers when interacting with one of the greatest scientists of the 20th century, from developing the field of femtochemistry to pioneering ultrafast electron diffraction and imaging technology. The personal dimension of Zewail's leadership is reflected in all the contributions, and highlighted by special tributes from two of his children.The scientific and anecdotal stories recounted in the book give a rare view of experiences in shaping science. The reader will get firsthand accounts of how a Nobel Prize winner interacted daily with his co-workers to develop the laser-based science and technology for which he was internationally recognized. The recounted experiences may serve as a basis for scientists developing their own research, tutoring students, and supervising postdoctoral researchers.

Organic Light-Emitting Transistors - Michele Muccini 2016-04-25

Provides an overview of the developments and applications of Organic Light Emitting Transistors (OLETs) science and technology This book discusses the scientific fundamentals and key technological features of Organic Light Emitting Transistors (OLETs) by putting them in the context of organic electronics and photonics. The characteristics of OLETs are benchmarked to those of OLEDs for applications in Flat Panel Displays and sensing technology. The authors provide a comparative analysis between OLED and OLET devices in order to highlight the fundamental differences in terms of device architecture and working principles, and to point out the enabling nature of OLETs for truly flexible displays. The book then explores the principles of OLET devices, their basic optoelectronic characteristics, the properties of currently available materials, processing and fabrication techniques, and the different approaches adopted to structure the active channel and to control organic and hybrid interfaces. Examines the photonic properties of OLETs, focusing on the external quantum efficiency, the brightness, the light outcoupling, and emission directionality Analyzes the charge transport and photophysical properties of OLET, emphasizing the excitonic properties and spatial emitting characteristics Reviews the key building blocks of the OLET devices and their role in determining the device’s performance Discusses the challenges in OLET design, namely color gamut, power efficiency, and reliability Presents key applications of OLET devices and their potential impact on display technology and sensing Organic Light-Emitting Transistors: Towards the Next Generation Display Technology serves as a reference for researchers, technology developers and end-users to have a broad view of the

distinguishing features of the OLET technology and to profile the impact on the display and sensing markets.

Tools and Modes of Representation in the Laboratory Sciences - U. Klein 2013-04-17

constitutive of reference in laboratory sciences as cultural sign systems and their manipulation and superposition, collectively shared classifications and associated conceptual frameworks,· and various fonns of collective action and social institutions. This raises the question of how much modes of representation, and specific types of sign systems mobilized to construct them, contribute to reference. Semioticians have argued that sign systems are not merely passive media for expressing preconceived ideas but actively contribute to meaning. Sign systems are culturally loaded with meaning stemming from previous practical applications and social traditions of applications. In new local contexts of application they not only transfer stabilized meaning but also can be used as active resources to add new significance and modify previous meaning. This view is supported by several analyses presented in this volume. Sign systems can be implemented like tools that are manipulated and superposed with other types of signs to forge new representations. The mode of representation, made possible by applying and manipulating specific types of representational tools, such as diagrammatic rather than mathematical representations, or Berzelian fonnulas rather than verbal language, contributes to meaning and forges fine-grained differentiations between scientists' concepts. Taken together, the essays contained in this volume give us a multifaceted picture of the broad variety of modes of representation in nineteenth-century and twentieth-century laboratory sciences, of the way scientists juxtaposed and integrated various representations, and of their pragmatic use as tools in scientific and industrial practice.

Programming of Life - Donald E. Johnson 2010

"This is currently the best book covering the relationship between genome and computer architectures." - JOHNATHAN BARTLETT, Author / Publisher / Speaker / Director of Technology ----- This book highlights the informational aspects of life that are generally overlooked or ignored in chemical and biological evolutionary scenarios. Each cell of an organism has millions of interacting computers reading and processing digital information, using digital programs and digital codes to communicate and translate information. Life is an intersection of physical science and information science. Both domains are critical for any life to exist, and each must be investigated using that domain's principles. Yet most scientists have been attempting to use physical science to explain life's information domain, a practice which has no scientific justification. -- As you can tell by the preceding words this research is a fascinating approach to the question of the origin of life. -(PUBLISHER) ----- "Programming of Life is an excellent freshman level review of the formal programming, coding/decoding, integration, organization, Prescriptive Information (PI), memory, regulation and control required for a physical object to find itself 'alive.' DONALD E. JOHNSON is uniquely qualified to unpackage the strong parallels between everyday cybernetic design and engineering and the workings of the cell. I highly recommend this book." -DAVID L. ABEL, Director, The Gene Emergence Project Department of ProtoBioCybernetics and ProtoBioSemiotics The Origin of Life Science Foundation, Inc. ----- (ABOUT THE AUTHOR:) DR. DON JOHNSON has earned Ph.D.s in both Computer & Information Sciences from the University of Minnesota and in Chemistry from Michigan State University. He was a senior research scientist for 10 years in pharmaceutical and medical / scientific instrument fields, served as president and technical expert in an independent computer consulting firm for many years, and taught for 20 years in universities in Wisconsin, Minnesota, California, and Europe. He now maintains scienceintegrity.net to expose unsubstantiated claims in science and has made presentations on most continents.

The Brilliant Zewail - El-nadi Lotfia M 2019-07-16

A book that enlightens the life of Ahmed H Zewail from his early childhood to his days at CalTech.Born in Damanhur, Egypt, Ahmed H Zewail grew up with his family, studied at a local primary school and eventually graduated from Alexandria University. After completing his schooling, he went on to teach chemistry to undergraduates at the

University of Alexandria.His contributions are not only to science but also to society. As a pioneer scientist, he returned to Egypt and had his fingerprints on all the initiatives to encourage scientific research and to upgrade the scientific and technological capabilities of his countrymen. He founded the Zewail City for Science and Technology — a non-profit educational institution for research and innovation in Cairo.A Nobel Prize winner, inventor of the ground-breaking four dimensional microscopy, and together with his other accolades, Ahmed H Zewail is one of the greatest scientists this century has produced. His foresight for the development of both the scientific and cultural fields in Egypt has made him a brilliant jewel for Egypt and the world.

Religion and the Sciences of Origins - Kelly James Clark 2014-05-21
This concise introduction to science and religion focuses on Christianity and modern Western science (the epicenter of issues in science and religion in the West) with a concluding chapter on Muslim and Jewish Science and Religion. This book also invites the reader into the relevant literature with ample quotations from original texts.

Reminiscences of Ahmed H. Zewail - Ahmed H. Zewail 2018

Turning Points in Solid-State, Materials and Surface Science - Kenneth D M Harris 2007-11-30
The scientific exploration of solid materials represents one of the most important, fascinating and rewarding areas of scientific endeavour in the present day, not only from the viewpoint of advancing fundamental understanding but also from the industrial perspective, given the immense diversity of applications of solid materials across the full range of commercial sectors. Turning Points in Solid-State, Materials and Surface Science provides a state-of-the-art survey of some of the most important recent developments across the spectrum of solid-state, materials and surface sciences, while at the same time reflecting on key turning points in the evolution of this scientific discipline and projecting into the directions for future research progress. The book serves as a timely tribute to the life and work of Professor Sir John Meurig Thomas FRS, who has made monumental contributions to this field of science throughout his distinguished 50-year career in research, during which he has initiated, developed and exploited many important branches of this field. Indeed, the depth and breadth of his contributions towards the evolution and advancement of this scientific discipline, and his critical role in elevating this field to the important position that it now occupies within modern science, are demonstrated recurrently throughout the chapters of this book. Individual chapters are contributed by internationally leading experts in their respective fields, and the topics covered include solid-state chemistry of inorganic and organic materials, heterogeneous catalysis, surface science and materials science, with one section of the book focusing on modern developments in electron microscopy and its contributions to chemistry and materials science. The book serves as a modern and up-to-date monograph in these fields, and provides a valuable resource to researchers in academia and industry who require a comprehensive source of information on this important and rapidly developing subject.

Voyage Through Time - Ahmed H. Zewail 2003
From a beginning in an Egyptian Delta town and the port of Alexandria to the scenic vistas of sunny southern California, Ahmed Zewail takes us on a voyage through time -- his own life and the split-second world of the femtosecond. In this engaging exposé of his life and work until his receipt of the Nobel Prize in 1999, Zewail explores in non-technical language the landscape of molecules glimpsed on the scale of one quadrillionth of a second: the femtosecond, 0. 000 000 000 000 001 second. Zewail enriches the journey into the strange territory of femtochemistry with insightful analogies and illustrations to aid both the general reader and the scientifically inclined. He likewise draws lessons from his life story so far, and he meditates on the impact the revolution in science has had on our modern world -- in both developed and developing countries. He suggests a concrete course of action for the world of the have-nots, and ends the book with hope for Egypt in developing the nation's greatest natural resource -- its youth -- to build a more promising future, and for America to develop a new vision domestically and internationally.

The Beauty and Fascination of Science - Anatoly L. Buchachenko 2020-07-14
In this book, Professor Anatoly Buchachenko gives a brief and informative description of the most striking achievements and discoveries made in the major natural sciences at the turn of the century – in the late twentieth and early twenty-first centuries. The author has a rare ability to describe scientific discoveries so that these achievements and their significance are understandable not only by professionals and scientists of all specialities, but for any reader interested in modern science, its role in the existence of mankind, and its impact on human society. Originally published in Russian, Professor Buchachenko's book describes the interaction of natural sciences with social ones—philosophy and history—as well as the part played by the human factor in the development of science, especially the role of the great scientists.
4D Electron Microscopy - Ahmed H. Zewail 2010
Structural phase transitions, mechanical deformations, and the embryonic stages of melting and crystallization are examples of phenomena that can now be imaged in unprecedented structural detail with high spatial resolution, and ten orders of magnitude as fast as hitherto. No monograph in existence attempts to cover the revolutionary dimensions that EM in its various modes of operation nowadays makes possible. The authors of this book chart these developments, and also compare the merits of coherent electron waves with those of synchrotron radiation. They judge it prudent to recall some important basic procedural and theoretical aspects of imaging and diffraction so that the reader may better comprehend the significance of the new vistas and applications now afoot. This book is not a vade mecum - numerous other texts are available for the practitioner for that purpose.
Social Dreaming - Susan Long 2019-01-03
The idea of social dreaming argues that dreams are relevant to the wider social sphere and have a collective resonance that goes beyond the personal narrative. In this fascinating collection, the principles of social dreaming are explored to uncover shared anxieties and prejudices, suggest likely responses, enhance cultural surveys, inform managerial policies and embody community affiliation. Including, for the first time, a coherent epistemology to support the theoretical principles of the field, the book reflects upon and extends the theory and philosophy behind the method, as well as discussing new research in the area, and how social dreaming practice is conducted in a range of localities, situations and circumstances. The book will appeal to anyone interested in the idea that social dreaming can help us to delve deeper into the question of what it means to be human, from psychoanalysts to sociologists and beyond.
Pathways to Modern Chemical Physics - Salvatore Califano 2012-05-26
In this historical volume Salvatore Califano traces the developments of ideas and theories in physical and theoretical chemistry throughout the 20th century. This seldom-told narrative provides details of topics from thermodynamics to atomic structure, radioactivity and quantum chemistry. Califano's expertise as a physical chemist allows him to judge the historical developments from the point of view of modern chemistry. This detailed and unique historical narrative is fascinating for chemists working in the fields of physical chemistry and is also a useful resource for science historians who will enjoy access to material not previously dealt with in a coherent way.
Scientific Babel - Michael D. Gordin 2015-04-13
English is the language of science today. No matter which languages you know, if you want your work seen, studied, and cited, you need to publish in English. But that hasn't always been the case. Though there was a time when Latin dominated the field, for centuries science has been a polyglot enterprise, conducted in a number of languages whose importance waxed and waned over time—until the rise of English in the twentieth century. So how did we get from there to here? How did French, German, Latin, Russian, and even Esperanto give way to English? And what can we reconstruct of the experience of doing science in the polyglot past? With Scientific Babel, Michael D. Gordin resurrects that lost world, in part through an ingenious mechanism: the pages of his highly readable narrative account teem with footnotes—not offering background information, but presenting quoted material in its original language. The result is stunning: as we read about the rise and fall of

languages, driven by politics, war, economics, and institutions, we actually see it happen in the ever-changing web of multilingual examples. The history of science, and of English as its dominant language, comes to life, and brings with it a new understanding not only of the frictions generated by a scientific community that spoke in many often mutually unintelligible voices, but also of the possibilities of the polyglot, and the losses that the dominance of English entails. Few historians of science write as well as Gordin, and Scientific Babel reveals his incredible command of the literature, language, and intellectual essence of science past and present. No reader who takes this linguistic journey with him will be disappointed.

Reminiscences of Ahmed H. Zewail - Ahmed H. Zewail 2018

This book presents the latest results from high energy physics laboratories. The topics discussed include: Cosmology, Heavy Ions, Electroweak, Heavy Flavour Physics and CP Violation/Rare Decays, QCD and Beyond the Standard Model, Planck Scale Physics, Accelerator and Non-Accelerator Physics and Instrumentation.

Molecular Beams in Physics and Chemistry - Bretislav Friedrich 2021-06-19

This Open Access book gives a comprehensive account of both the history and current achievements of molecular beam research. In 1919, Otto Stern launched the revolutionary molecular beam technique. This technique made it possible to send atoms and molecules with well-defined momentum through vacuum and to measure with high accuracy the deflections they underwent when acted upon by transversal forces. These measurements revealed unforeseen quantum properties of nuclei, atoms, and molecules that became the basis for our current understanding of quantum matter. This volume shows that many key areas of modern physics and chemistry owe their beginnings to the seminal molecular beam work of Otto Stern and his school. Written by internationally recognized experts, the contributions in this volume will help experienced researchers and incoming graduate students alike to keep abreast of current developments in molecular beam research as well as to appreciate the history and evolution of this powerful method and the knowledge it reveals.

Femtochemistry - Ahmed H. Zewail 1994

These two volumes on Femtochemistry present a timely contribution to a field central to the understanding of the dynamics of the chemical bond. This century has witnessed great strides in time and space resolutions, down to the atomic scale, providing chemists, biologists and physicists with unprecedented opportunities for seeing microscopic structures and dynamics. Femtochemistry is concerned with the time resolution of the most elementary motions of atoms during chemical change -- bond breaking and bond making -- on the femtosecond (10-15 second) time scale. This atomic scale of time resolution has now reached the ultimate for the chemical bond and as Lord George Porter puts it, chemists are near the end of the race against time. These two volumes cover the general concepts, techniques and applications of femtochemistry.Professor Ahmed Zewail, who has made the pioneering contributions in this field, has from over 250 publications selected the articles for this anthology. These volumes begin with a commentary and a historical chronology of the milestones. He then presents a broad perspective of the current state of knowledge in femtochemistry by researchers around the world and discusses possible new directions. In the words of a colleague, "it is a must on the reading-list for all of my students ... all readers will find this to be an informative and valuable overview."The introductory articles in Volume I provide reviews for both the non-experts as well as for experts in the field. This is followed by papers on the basic concepts. For applications, elementary reactions are studied first and then complex reactions. Volume I is complete with studies of solvation dynamics, non-reactive systems, ultrafast electron diffraction and the control of chemical reactions.Volume II continues with reaction rates, the concept of elementary intramolecular vibrational-energy redistribution (IVR) and the phenomena of rotational coherence which has become a powerful tool for the determination of molecular structure via time resolution. The second volume ends with an extensive list of references, according to topics, based on work by Professor Zewail and his group at Caltech.These collected works by Professor Zewail will

certainly be indispensable to both experts and beginners in the field. The author is known for his clarity and for his creative and systematic contributions. These volumes will be of interest and should prove useful to chemists, biologists and physicists. As noted by Professor J Manz (Berlin) and Professor A W Castleman, Jr. (Penn State): femtochemistry is yielding exciting new discoveries from analysis to control of chemical reactions, with applications in many domains of chemistry and related fields, e.g., physical, organic and inorganic chemistry, surface science, molecular biology, ... etc.

Nonlinear Spectroscopy - Società italiana di fisica 1977

Symmetry through the Eyes of a Chemist - Istvan Hargittai 2007-08-29
We have been gratified by the warm reception of our book, by reviewers, colleagues, and students alike. Our interest in the subject matter of this book has not decreased since its first appearance; on the contrary. The first and second editions envelop eight other symmetry-related books in the creation of which we have participated: I. Hargittai (ed.), Symmetry: Unifying Human Understanding, Pergamon Press, New York, 1986. I. Hargittai and B. K. Vainshtein (eds.), Crystal Symmetries. Shubnikov Centennial Papers, Pergamon Press, Oxford, 1988. M. Hargittai and I. Hargittai, Fedezziikf6l a szimmetri6t! (Discover Sym- try, in Hungarian), Tank6nyvkiad6, Budapest, 1989. I. Hargittai (ed.), Symmetry 2: Unifying Human Understanding, Pergamon Press, Oxford, 1989. I. Hargittai (ed.), Quasicrystals, Networks, and Molecules of Fivefold Sym- try, VCH, New York, 1990. I. Hargittai (ed.), Fivefold Symmetry, World Scientific, Singapore, 1992. I. Hargittai and C. A. Pickover (eds.), Spiral Symmetry, World Scientific, Singapore, 1992. I. Hargittai and M. Hargittai, Symmetry: A Unifying Concept, Shelter Publi- tions, Bolinas, California, 1994. We have also pursued our molecular structure research, and some books have appeared related to these activities: vi Preface to the Second Edition I. Hargittai and M. Hargittai (eds.), Stereochemical Applications of Gas-Phase Electron Diffraction, Parts A and B, VCH, New York, 1988. R. Gillespie and I. Hargittai, VSEPR Model of Molecular Geometry, Allyn and Bacon, Boston, 1991. A. Domenicano and I. Hargittai (eds.), Accurate Molecular Structures, Oxford University Press, Oxford, 1992.

Conversations on Chemistry - Jane Haldimand Marcet 2010-10-31
Bright, humorous and engaging, Marcet's best-selling 1805 book was designed to introduce women to scientific ideas.

The Chemical Bond - Ahmed Zewail 1992-05-14
This inspired book by some of the most influential scientists of our time--including six Nobel laureates--chronicles our emerging understanding of the chemical bond through the last nine decades and into the future. From Pauling's early structural work using x-ray and electron diffraction to Zewail's femtosecond lasers that probe molecular dynamics in real time; from Crick's molecular biology to Rich's molecular recognition, this book explores a rich tradition of scientific heritage and accomplishment. The perspectives given by Pauling, Perutz, Rich, Crick, Porter, Polanyi, Herschbach, Zewail, and Bernstein celebrate major scientific achievements in chemistry and biology with the chemical bond playing a fundamental role. In a unique presentation that also provides some lively insights into the very nature of scientific thought and discovery, The Chemical Bond: Structure and Dynamics will be of general interest to scientists, science historians, and the scientifically inclined populous.

Natural Products and Neuroprotection - Cristina Angeloni 2020-06-17
Neurodegenerative diseases, including Alzheimer’s, Parkinson’s, Huntington’s, and amyotrophic lateral sclerosis, are the most common pathologies of the central nervous system currently without a cure. They share common molecular and cellular characteristics, including protein misfolding, mitochondrial dysfunction, glutamate toxicity, dysregulation of calcium homeostasis, oxidative stress, inflammation, and ageing, which contribute to neuronal death. Efforts to treat these diseases are often limited by their multifactorial etiology. Natural products, thanks to their multitarget activities, are considered promising alternatives for the treatment of neurodegeneration. This book deals with two different forms of natural products: extracts and isolated compounds. The study of the bioactivity of the extracts is extremely important as many studies have demonstrated the synergistic effect of the combination of different natural products. On the other hand, the investigation of the activity of

specifically isolated natural products can be also important to understand their cellular and molecular mechanisms and to define the specific bioactive components in extracts or foods. This book can be considered an important contribution to knowledge of the neuroprotective effect of natural products and presents a great deal of information, related to both the benefits but also the limitations of their use in counteracting neurodegeneration.

Encyclopedia of Time - H. James Birx 2009-01-13

Surveying the major facts, concepts, theories, and speculations that infuse our present comprehension of time, the Encyclopedia of Time: Science, Philosophy, Theology, and Culture explores the contributions of scientists, philosophers, theologians, and creative artists from ancient times to the present. By drawing together into one collection ideas from scholars around the globe and in a wide range of disciplines, this Encyclopedia will provide readers with a greater understanding of and appreciation for the elusive phenomenon experienced as time. Features · Surveys historical thought about time, including those that emerged in ancient Greece, early Christianity, the Italian Renaissance, the Age of Enlightenment, and other periods+ Covers the original and lasting insights of evolutionary biologist Charles Darwin, physicist Albert Einstein, philosopher Alfred North Whitehead, and theologian Pierre Teilhard de Chardin + Discusses the significance of time in the writings of Isaac Asimov, Samuel Taylor Coleridge, Fyodor M. Dostoevsky, Francesco Petrarch, and numerous other authors+ Includes the contributions of naturalists, philosophers, physicists, theologians, astronomers, anthropologists, geologists, paleontologists, and psychologists+ Includes artists+ portrayals of the fluidity of time, including painter Salvador Dali+s The Persistence of Memory and The Discovery of America by Christopher Columbus, and writers Gustave Flaubert+s The Temptation of Saint Anthony and Henryk Sienkiewicz+s Quo Vadis+ Provides a truly interdisciplinary approach, with discussions of Aztec, Buddhist, Christian, Egyptian, Ethiopian, Islamic, Hindu, Navajo, and many other cultures+ conceptions of time

Optics in Our Time - Mohammad D. Al-Amri 2016-12-12

Light and light based technologies have played an important role in transforming our lives via scientific contributions spanned over thousands of years. In this book we present a vast collection of articles on various aspects of light and its applications in the contemporary world at a popular or semi-popular level. These articles are written by the world authorities in their respective fields. This is therefore a rare volume where the world experts have come together to present the developments in this most important field of science in an almost pedagogical manner. This volume covers five aspects related to light. The first presents two articles, one on the history of the nature of light, and the other on the scientific achievements of Ibn-Haitham (Alhazen), who is broadly considered the father of modern optics. These are then followed by an article on ultrafast phenomena and the invisible world. The third part includes papers on specific sources of light, the discoveries of which have revolutionized optical technologies in our lifetime. They discuss the nature and the characteristics of lasers, Solid-state lighting based on the Light Emitting Diode (LED) technology, and finally modern electron optics and its relationship to the Muslim golden age in science. The book’s fourth part discusses various applications of optics and light in today's world, including biophotonics, art, optical communication, nanotechnology, the eye as an optical instrument, remote sensing, and optics in medicine. In turn, the last part focuses on quantum optics, a modern field that grew out of the interaction of light and matter. Topics addressed include atom optics, slow, stored and stationary light, optical tests of the foundation of physics, quantum mechanical properties of light fields carrying orbital angular momentum, quantum communication, and Wave-Particle dualism in action.

Femtochemistry and Femtobiology - Monique M. Martin 2004-04-16

This book reflects the heights of knowledge of ultrafast chemical processes attained in these early years of the 21st century : the latest research in femtosecond and picosecond molecular processes in Chemistry and Biology, carried out around the world, is described here in more than 110 articles. The results were presented and discussed at the VIth International Conference on Femtochemistry, in Paris, France,

from July 6 to July 10, 2003. The articles published here were reviewed by referees selected from specialists in the Femtochemistry community, guaranteeing a collective responsability for the quality of the research reported in the next 564 pages. Femtochemistry is an ever-growing field, where new research areas are constantly opening up, and one which both stimulates and accompanies the development of ultrafast technologies. The increasing interest in femtobiology and chemistry at the frontier with biology is an obvious indicator of the present impact of life sciences in our society. New materials and reactions at surfaces are also some of the relatively new topics that promise rapid developments. New methodologies and technologies for probing and following in real time molecular dynamical phenomena have appeared within the last ten years or so. These methods, based on multidimensional IR spectroscopies, ultrafast X-ray and electron diffraction techniques, are well represented in this book. Of ever-improving performance, they are now applied to the characterization of structural dynamics of an increasing number of chemical and biological systems. This book reports the state of research in Femtochemistry and Femtobiology presented at Paris, at the Maison de la Chimie, in July 2003, representing the tenth anniversary of the conference. * Overview of the most recent research on ultrafast events * Application of new methodologies on chemical and biological systems * Contributions by key players in the field

Encyclopedia of Modern Optics - Robert D. Guenther 2005

Unparalleled reference work for all researchers in field of Optics, Fiber Systems, Material Science, Atomic and Molecular Physics, Laser Physics. Covers all the sub fields of Optical Physics as well as related fields as Engineering, which impact manufacturing and many practical applications. Alphabetically arranged for ease of use cross-references to aid in tracking down all aspects of a topic under investigation.