An Introduction To Environmental Biophysics
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John
An Introduction to Environmental Biophysics—Gaylon S. Campbell 2012-12-06

The study of environmental biophysics probably began earlier in man's history than that of any other science. The study of organism-environment interaction provided a key to survival and progress. Systematic study of the science and recording of experimental results goes back many hundreds of years. Benjamin Franklin, the early American statesman, inventor, printer, and scientist studied conduction, evaporation, and radiation. One of his observations is as follows: My desk on which I now write, and the lock of my desk, are both exposed to the same temperature of the air, and have therefore the same degree of heat or cold; yet if I lay my hand successively on the wood and on the metal, the latter feels much the coldest, not that it is really so, but being a better conductor, it more readily than the wood takes away and draws into itself the fire that was in my skin. Franklin probably was not the first to discover this principle, and certainly was not the last. Modern researchers rediscover this principle frequently in their own work. It is sometimes surprising how slowly progress is made. Progress in environmental biophysics, since the observations of Franklin and others, has been mainly in two areas: use of mathematical models to quantify rates of heat and mass transfer and use of the continuity equation that has led to energy budget analyses.

Biophysics—Roland Glaser 2012-04-23

Biophysics is the science of physical principles underlying all processes of life, including the dynamics and kinetics of biological systems. This fully revised 2nd English edition is an introductory text that spans all steps of biological organization, from the molecular, to the organism level, as well as influences of environmental factors. In response to the enormous progress recently made, especially in theoretical and molecular biophysics, the author has updated the text, integrating new results and developments concerning protein folding and dynamics, molecular aspects of membrane assembly and transport, noise-enhanced processes, and photo-biophysics. The advances made in theoretical biology in the last decade call for a fully new conception of the corresponding sections. Thus, the book provides the background needed for fundamental training in biophysics and, in addition, offers a great deal of advanced biophysical knowledge.

Biophysics—Rodney Cotterill 2003-07-07

Biophysics is an evolving, multidisciplinary subject which applies physics to biological systems and promotes an understanding of their physical properties and behaviour. Biophysics: An Introduction, is a concise balanced introduction to this subject. Written in an accessible and readable style, the book takes a fresh, modern approach with the author successfully combining key concepts and theory with relevant applications and examples drawn from the field as a whole. Beginning with a brief introduction to the origins of biophysics, the book takes the reader through successive levels of complexity, from atoms to molecules, structures, systems and ultimately to the behaviour of organisms. The book also includes extensive coverage of biopolymers, biomembranes, biological energy, and nervous systems. The text not only explores basic ideas, but also discusses recent developments, such as protein folding, DNA/RNA conformations, molecular motors, optical tweezers and the biological origins of consciousness and intelligence. Biophysics: An Introduction * Is a carefully structured introduction to biological and medical physics * Provides exercises at the end of each chapter to encourage student understanding Assuming little biological or medical knowledge, this book is invaluable to undergraduate students in physics, biophysics and medical physics. The book is also useful for graduate students and researchers looking for a broad introduction to the subject.

Plants and Microclimate—Hamlyn G. Jones 1992-06-04

This introduction to the features of the atmospheric environment is of particular relevance to plants and describes the physical and physiological principles required for understanding their interaction with the environment.

Introduction to Environmental Soil Physics—Daniel Hillel 2003-12-17

An abridged, student-oriented edition of Hillel’s earlier published Environmental Soil Physics, Introduction to Environmental Soil Physics is a more succinct elucidation of the physical principles and processes governing the behavior of soil and the vital role it plays in both natural and managed ecosystems. The textbook is self-contained and self-explanatory, with numerous illustrations and sample problems. Based on sound fundamental theory, the textbook leads to a practical consideration of soil as a living system in nature and illustrates the influences of human activity upon soil structure and function. Students, as well as other readers, will better understand the importance of soils and the pivotal position they occupy with respect to
careful and knowledgeable conservation. Written in an engaging and clear style, posing and resolving issues relevant to the terrestrial environment Explores the gamut of the interactions among the phases in the soil and the dynamic interconnection of the soil with the subterranean and atmospheric domains Reveals the salient ideas, approaches, and methods of environmental soil physics Includes numerous illustrative exercises, which are explicitly solved Designed to serve for classroom and laboratory instruction, for self-study, and for reference Oriented toward practical problems in ecology, field-scale hydrology, agronomy, and civil engineering Differs from earlier texts in its wider scope and holistic environmental conception

An Introduction to Environmental Biophysics-Gaylon S. Campbell 2012-12-06 From reviews of the first edition: "well organized . . . Recommended as an introductory text for undergraduates" -- AAAS Science Books and Films "well written and illustrated" -- Bulletin of the American Meteorological Society

Environmental Physics-Egbert Boeker 2011-09-19 Environmental Physics Third Edition - Sustainable Energy and Climate Change Egbert Boeker & Rienk van Grondelle, VU University Amsterdam, Netherlands Environmental Physics, Third Edition serves as an introduction to physics in the context of societal problems such as energy supply, pollution, climate change and finite resources of fossil fuels and uranium. The emphasis of this text is on physics, i.e. the concepts and principles that help in understanding the ways to produce energy efficiently or to mitigate climate change. Extra attention is given to photosynthesis due to its importance in the field of renewable energy. This thoroughly revised and updated third edition focuses on the utilization of sustainable energy and mitigating climate change. The text explains the physical mechanisms behind climate change and discusses the physics of renewable energy options. Nuclear power is treated in a separate chapter because of its social and political importance. In the final chapter political and social aspects of 'renewable energy and climate change' are reviewed. A distinguishing feature of the text is the discussion of spectroscopy and spectroscopic methods, again from basic concepts, as a crucial means to quantitatively analyze and monitor the condition of the environment, the factors determining climate change and all aspects of energy conversion. This textbook will be invaluable to students in physics and related subjects such as physical chemistry and geophysics. It assumes a basic knowledge in physics and mathematics, and all equations are derived from first principles and explained in a physical way. Supplementary material including sections from earlier editions of this book, a description of environmental experiments for a student's labs and computer codes to expand some of the books' content are available from www.few.vu.nl/environmentalphysics

An Introduction to Applied and Environmental Geophysics-John M. Reynolds 2011-07-07 An Introduction to Applied and Environmental Geophysics, 2nd Edition, describes the rapidly developing field of near-surface geophysics. The book covers a range of applications including mineral, hydrocarbon and groundwater exploration, and emphasises the use of geophysics in civil engineering and in environmental investigations. Following on from the international popularity of the first edition, this new, revised, and much expanded edition contains additional case histories, and descriptions of geophysical techniques not previously included in such textbooks. The level of mathematics and physics is deliberately kept to a minimum but is described qualitatively within the text. Relevant mathematical expressions are separated into boxes to supplement the text. The book is profusely illustrated with many figures, photographs and line drawings, many never previously published. Key source literature is provided in an extensive reference section; a list of web addresses for key organisations is also given in an appendix as a valuable additional resource. Covers new techniques such as Magnetic Resonance Sounding, Controlled- Source EM, shear-wave seismic refraction, and airborne gravity and EM techniques Now includes radioactivity surveying and more discussions of down-hole geophysical methods; hydrographic and Sub-Bottom Profiling; and UneXploded Ordnance detection Expanded to include more forensic, archaeological, glaciological, agricultural and bio-geophysical applications Includes more information on physio-chemical properties of geological, engineering and environmental materials Takes a fully global approach Companion website with additional resources available at www.wiley.com/go/reynolds/introduction2e Accessible core textbook for undergraduates as well as an ideal reference for industry professionals The second edition is ideal for students wanting a broad introduction to the subject and is also designed for practising civil and geotechnical engineers, geologists, archaeologists and environmental scientists who need an overview of modern geophysical methods relevant to their discipline. While the first edition was the first textbook to provide such a comprehensive coverage of environmental geophysics, the second edition is even more far ranging in terms of techniques, applications and case histories.

Plant Physics-Karl J. Niklas 2012-02-06 From Galileo, who used the hollow stalks of grass to demonstrate the idea that peripherally located construction materials provide most of the resistance to bending forces, to Leonardo da Vinci, whose illustrations of the parachute are alleged to be based on his study of the dandelion’s
pappus and the maple tree’s samara, many of our greatest physicists, mathematicians, and engineers have learned much from studying plants. A symbiotic relationship between botany and the fields of physics, mathematics, engineering, and chemistry continues today, as is revealed in Plant Physics. The result of a long-term collaboration between plant evolutionary biologist Karl J. Niklas and physicist Hanns-Christof Spatz, Plant Physics presents a detailed account of the principles of classical physics, evolutionary theory, and plant biology in order to explain the complex interrelationships among plant form, function, environment, and evolutionary history. Covering a wide range of topics—from the development and evolution of the basic plant body and the ecology of aquatic unicellular plants to mathematical treatments of light attenuation through tree canopies and the movement of water through plants’ roots, stems, and leaves—Plant Physics is destined to inspire students and professionals alike to traverse disciplinary membranes.

Biophysics DeMYSTiFied-Daniel Goldfarb 2010-12-06 Learn BIOPHYSICS without expending a lot of ENERGY! Interested in unraveling the physics of living things? Here’s your starting point. Biophysics Demystified is the fast and easy way to understand this fascinating topic. Written in a step-by-step format, this practical guide begins with an introduction to the science of biophysics, covering biophysical techniques and applications. Next, you’ll learn the principles of physics, biology, and chemistry required to understand biophysics, including free energy, entropy, and statistical mechanics. Biomolecules and the forces that influence their structure and conformation are also covered, as are protein, nucleic acid, and membrane biophysics. Detailed examples and concise explanations make it easy to understand the material, and end-of-chapter quizzes and a final exam help reinforce key concepts. It’s a no-brainer! You’ll get: Molecular, subcellular, physiological, anatomical, and environmental biophysics The laws of thermodynamics as they apply to biophysical systems Forces affecting conformation in biological molecules The composition and structure of carbohydrates, lipids, proteins, and nucleic acids The fluid mosaic model Simple enough for a beginner, but challenging enough for an advanced student, Biophysics Demystified makes this interdisciplinary subject easy to master.

Environmental Soil Physics-Daniel Hillel 1998-09-09 Environmental Soil Physics is a completely updated and modified edition of the Daniel Hillels previous, successful books, Introduction to Soil Physics and Fundamentals of Soil Physics. Hillel is a Pulitzer Prize-winning author, one of the true leaders in the field of environmental sciences. The new version includes a chapter and problems on computational techniques, addresses current environmental concerns and trends. Updates and expands the scope of Hillel’s prior works, Fundamentals of Soil Physics (1980)and Applications of Soil Physics (1980) Explores the wide range of interactions among the phases in the soil and the dynamic interconnections of the soil with the subterranean and atmospheric domains Draws attention to historical and contemporary issues concerning the human management of soil and water resources Directs readers toward solution of practical problems in terrestrial ecology, field-scale hydrology, agronomy, and civil engineering Incorporates contributions by leading scientists in the areas of spatial variability, soil remediation, and the inclusion of land-surface processes in global climate models

Biophysics-Roland Glaser 2004-10-22 Biophysics is the science of physical principles underlying the "phenomenon of life" on all levels of organization. This book begins with an introduction to the science of biophysics, covering biophysical techniques and applications. Next, you’ll learn the principles of physics, biology, and chemistry required to understand biophysics, including free energy, entropy, and statistical mechanics. Biomolecules and the forces that influence their structure and conformation are also covered, as are protein, nucleic acid, and membrane biophysics. Detailed examples and concise explanations make it easy to understand the material, and end-of-chapter quizzes and a final exam help reinforce key concepts. It’s a no-brainer! You’ll get: Molecular, subcellular, physiological, anatomical, and environmental biophysics The laws of thermodynamics as they apply to biophysical systems Forces affecting conformation in biological molecules The composition and structure of carbohydrates, lipids, proteins, and nucleic acids The fluid mosaic model Simple enough for a beginner, but challenging enough for an advanced student, Biophysics Demystified makes this interdisciplinary subject easy to master.

Principles of Environmental Physics-John Monteith 1990-03 Thoroughly revised and up-dated edition of a highly successful textbook.

Aquatic Photosynthesis-Paul G. Falkowski 2013-10-31 Aquatic Photosynthesis is a comprehensive guide to understanding the evolution and ecology of photosynthesis in aquatic environments. This second edition, thoroughly revised to bring it up to date, describes how one of the most fundamental metabolic processes evolved and transformed the surface chemistry of the Earth. The book focuses on recent biochemical and biophysical advances and the molecular biological techniques that have made them possible. In ten chapters that are self-contained but that build upon information presented earlier, the book starts with a reductionist, biophysical description of the photosynthetic reactions. It then moves through biochemical and molecular biological patterns in aquatic photoautotrophs, physiological and ecological principles, and global biogeochemical cycles. The book considers applications to ecology, and refers to historical developments. It can be used as a primary text in a lecture course, or as a supplemental text in a survey course such as biological oceanography, limnology, or biogeochemistry.

Environmental Social Sciences-Ismael Vaccaro 2010-11-11 The relationship between human communities and the environment is extremely complex. In order to
resolve the issues involved with this relationship, interdisciplinary research combining natural sciences, social sciences, and humanities is necessary. In this 2010 book, specialists summarise methods and research strategies for various aspects of social research devoted to environmental issues. Each chapter is illustrated with ethnographic and environmental examples, ranging from Australia to Amazonia, from Madagascar to the United States, and from prehistoric and historic cases to contemporary rural and urban ones. It deals with climate change, deforestation, environmental knowledge, natural reserves, politics and ownership of natural resources, and the effect of differing spatial and temporal scales. Contributing to the intellectual project of interdisciplinary environmental social science, this book shows the possibilities social science can provide to environmental studies and to larger global problems and thus will be of equal interest to social and natural scientists and policy makers.

Biophysical Ecology-D. M. Gates 2012-12-06 The objective of this book is to make analytical methods available to students of ecology. The text deals with concepts of energy exchange, gas exchange, and chemical kinetics involving the interactions of plants and animals with their environments. The first four chapters are designed to show the applications of biophysical ecology in a preliminary, simplified manner. Chapters 5-10, treating the topics of radiation, convection, conduction, and evaporation, are concerned with the physical environment. The spectral properties of radiation and matter are thoroughly described, as well as the geometrical, instantaneous, daily, and annual amounts of both shortwave and longwave radiation. Later chapters give the more elaborate analytical methods necessary for the study of photosynthesis in plants and energy budgets in animals. The final chapter describes the temperature responses of plants and animals. The discipline of biophysical ecology is rapidly growing, and some important topics and references are not included due to limitations of space, cost, and time. The methodology of some aspects of ecology is illustrated by the subject matter of this book. It is hoped that future students of the subject will carry it far beyond its present status. Ideas for advancing the subject matter of biophysical ecology exceed individual capacities for effort, and even today, many investigators in ecology are studying subjects for which they are inadequately prepared. The potential of modern science, in the minds and hands of skilled investigators, to solve environmental problems.

Environmental Biology-Mike Calver 2009-05-18 Environmental Biology offers a fresh approach to the topic in demonstrating how biological principles are applied to environmental problems. They raise fundamental questions about the world and our place in it. What, for instance, is the natural world? Do we humans belong to it? Which parts of it are we morally obliged to protect? Drawing on an exceptionally wide range of sources, from virtue ethics to Buddhism, leading environmental philosopher Simon P. James sets out to answer these vitally important questions. The book begins with a discussion of animal minds, before moving on to explore our moral relations with non-human organisms, ecosystems and the earth as a whole. James then considers environmental aesthetics, humanity's place in the natural world and the question of what it means to be wild. In the concluding chapter, he applies his findings to the topic of global climate change, building a strong moral case for urgent action. This accessible, entertainingly written book will be essential reading for students of the environment across the humanities and social sciences. It will, moreover, be an ideal guide for anyone keen to deepen their understanding of environmental issues.

Biophysics-C. Sybesma 1989-07-31 Today, courses on biophysics are taught in almost all universities in the world, often in separate biophysics departments or divisions. This reflects the enormous growth of the field, even though the problem of its formal definition remains unsettled. In spite of this lack of definition, biophysics, which can be considered as an amalgamation of the biological and the physical sciences, is recognized as a major scientific activity that has led to spectacular developments in biology. It has increased our knowledge of biological systems to such an extent that even industrial and commercial interests are now
beginning to put their stamps on biological research. A major part of these developments took place during the last two decades. Therefore, an introductory textbook on biophysics that was published a dozen years ago (c. Sybesma, An Introduction to Biophysics, Academic Press, 1977) no longer could fulfil " ... the need for a comprehensive but elementary textbook ... " (R. Cammack, Nature 272 (1978), 96). However, because of the increased proliferation of biophysics into higher education, the need for introductory course texts on biophysics is stronger than ever. This fact, together with valuable comments of many readers, have encouraged me to revise the original book.

Environmental Organic Chemistry-René P. Schwarzenbach 2005-06-24 Environmental Organic Chemistry focuses on environmental factors that govern the processes that determine the fate of organic chemicals in natural and engineered systems. The information discovered is then applied to quantitatively assessing the environmental behaviour of organic chemicals. Now in its 2nd edition this book takes a more holistic view on physical-chemical properties of organic compounds. It includes new topics that address aspects of gas/solid partitioning, bioaccumulation, and transformations in the atmosphere. Structures chapters into basic and sophisticated sections Contains illustrative examples, problems and case studies Examines the fundamental aspects of organic, physical and inorganic chemistry - applied to environmentally relevant problems Addresses problems and case studies in one volume

Introduction to Environmental Engineering-Stefan Fränzle 2012-01-24 Building on the first principles of environmental chemistry, engineering, and ecology, this volume fills the need for an advanced textbook introducing the modern, integrated environmental management approach, with a view towards long-term sustainability and within the framework of international regulations. As such, it presents the classic technologies alongside innovative ones that are just now coming into widespread use, such as photochemical technologies and carbon dioxide sequestration. Numerous case studies from the fields of air, water and soil engineering describe real-life solutions to problems in pollution prevention and remediation, as an aid to practicing professional skills. With its tabulated data, comprehensive list of further reading, and a glossary of terms, this book doubles as a reference for environmental engineers and consultants.

Physics in a New Era-National Research Council 2001-07-15 Physics at the beginning of the twenty-first century has reached new levels of accomplishment and impact in a society and nation that are changing rapidly. Accomplishments have led us into the information age and fueled broad technological and economic development. The pace of discovery is quickening and stronger links with other fields such as the biological sciences are being developed. The intellectual reach has never been greater, and the questions being asked are more ambitious than ever before. Physics in a New Era is the final report of the NRC's six-volume decadal physics survey. The book reviews the frontiers of physics research, examines the role of physics in our society, and makes recommendations designed to strengthen physics and its ability to serve important needs such as national security, the economy, information technology, and education.

Environment and Society-Paul Robbins 2014-01-28 Substantially updated for the second edition, this engaging and innovative introduction to the environment and society uses key theoretical approaches to explore familiar objects. Features substantial revisions and updates for the second edition, including new chapters on E waste, mosquitoes and uranium, improved maps and graphics, new exercises, shorter theory chapters, and refocused sections on environmental solutions Discusses topics such as population and scarcity, commodities, environmental ethics, risks and hazards, and political economy and applies them to objects like bottled water, tuna, and trees Accessible for students, and accompanied by in-book and online resources including exercises and boxed discussions, an online test bank, notes, suggested reading, and website links for enhanced understanding Offers additional online support for instructors, including suggested teaching models, PowerPoint slides for each chapter with full-color graphics, and supplementary images and teaching material

An Introduction to Environmental Chemistry-Julian E. Andrews 2013-04-25 This introductory text explains the fundamentals of the chemistry of the natural environment and the effects of mankind's activities on the earth's chemical systems. Retains an emphasis on describing how natural geochemical processes operate over a variety of scales in time and space, and how the effects of human perturbation can be measured. Topics range from familiar global issues such as atmospheric pollution and its effects on global warming and ozone destruction, to microbiological processes that cause pollution of drinking water. Contains sections and information boxes that explain the basic chemistry underpinning the subject covered. Each chapter contains a list of further reading on the subject area Updated case studies. No prior chemistry knowledge required. Suitable for introductory level courses.

Mathematics for Ecology and Environmental Sciences-Yasuhiro Takeuchi 2007-01-19 This volume discusses the rich and interesting properties of dynamical systems that appear in ecology and environmental sciences. It provides a fascinating survey of the theory of dynamical systems in ecology and environmental science. Each
chapter introduces students and scholars to the state-of-the-art in an exciting area, presents new results, and inspires future contributions to mathematical modeling in ecology and environmental sciences.

Physical Principles of Meteorology and Environmental Physics-David Blake 2008-06-09 This book starts with the big picture, relating Einstein's famous mass-energy formula $E = mc^2$ to the global climate; and then proceeds to examine the structure and dynamics of the atmosphere, from the synoptic scale through to the microscale, including the interaction of living things with their environment. It covers a range of topics from the laboratory to the field, including the analysis of thermodynamic diagrams and dispersion of pollutants, simple micrometeorological experiments on a sports field, as well as a detailed study on the measurement of carbon dioxide exchange between the atmosphere and tropical rainforests. Straightforward, simple models and short arguments are used wherever possible to promote physical understanding, for example, in the discussion of the greenhouse effect. The aim is to bring the reader to the point where he or she is able to understand and analyze weather charts in daily use around the world; obtain an appreciation of current experimental techniques; and also make informed, quantitative estimates in relation to current issues surrounding the current debate on climate change.

Environmental Science-Egbert Boeker 2001-11-06 Aimed at a first course in environmental physics, environmental science, environmental analysis, or environmental monitoring. This text can be used by first year students and above, and takes a scientific approach as opposed to a social or political one. Mathematics is kept to a minimum, although some background (school) knowledge of science is assumed. Courses would be taught in physics, environmental science and physical science departments. Comprehensively covering the field, this book brings together the latest developments, theories, research and concerns, from both the scientific and social sides. Placing the environment firmly at the centre of the scientific agenda, it provides all the background needed by readers to fully understand this important and often 'hype-driven' subject. Whilst mathematics is introduced where necessary, it is carefully explained and kept simple, with derivations generally being avoided. Wherever possible, topics of current concern and relevance are included, and many examples, features and appetisers or mini-case studies are included, frequently drawn from publications such as New Scientist, Nature, Science, Physics Today and Scientific American. The book starts with a general overview of the subject, and then moves on to cover climate, energy, pollutants, noise, measurements and social aspects.

Evolution of Primary Producers in the Sea-Paul Falkowski 2011-08-31 Evolution of Primary Producers in the Sea reference examines how photosynthesis evolved on Earth and how phytoplankton evolved through time - ultimately to permit the evolution of complex life, including human beings. The first of its kind, this book provides thorough coverage of key topics, with contributions by leading experts in biophysics, evolutionary biology, micropaleontology, marine ecology, and biogeochemistry. This exciting new book is of interest not only to students and researchers in marine science, but also to evolutionary biologists and ecologists interested in understanding the origins and diversification of life. Evolution of Primary Producers in the Sea offers these students and researchers an understanding of the molecular evolution, phylogeny, fossil record, and environmental processes that collectively permits us to comprehend the rise of phytoplankton and their impact on Earth's ecology and biogeochemistry. It is certain to become the first and best word on this exhilarating topic. Discusses the evolution of phytoplankton in the world's oceans as the first living organisms and the first and basic producers in the earth's food chain. Includes the latest developments in the evolution and ecology of marine phytoplankton specifically with additional information on marine ecosystems and biogeochemical cycles. The only book to consider of the evolution of phytoplankton and its role in molecular evolution, biogeochemistry, paleontology, and oceanographic aspects. Written at a level suitable for related reading use in courses on the Evolution of the Biosphere, Ecological and Biological oceanography and marine biology, and Biodiversity.


Climate Change and Terrestrial Ecosystem Modeling-Gordon Bonan 2019-02-28 Provides an essential introduction to modeling terrestrial ecosystems in Earth system models for graduate students and researchers.

Biophysics-Vasantha Pattabhi 2002 This book addresses the needs of biologists, biochemists and medical biophysicists for an introduction to the subject. The text covers a range of topics from quantum mechanics to pre-biotic evolution.

Radiation Protection and Dosimetry-Michael G. Stabin 2007-09-12 This book provides a comprehensive yet accessible overview of all relevant topics in the field of radiation protection (health physics). The text is organized to introduce the reader to basic principles of radiation emission and propagation, to review current knowledge and historical aspects of the biological effects of radiation, and to cover important operational topics such as radiation shielding and dosimetry. The
An Introduction to Environmental Biophysics

Mikhail V. Volenshtein 2013-12-11

This book treats a new, far-from-fully-developed area of molecular biophysics: enzyme physics. An attempt is made to survey this field, but primary consideration is given to three problems under investigation in the Polymer Structure Laboratory of the Institute of High-Molecular Compounds, Academy of Sciences of the USSR. The first problem is the genetic coding of the biologically functional structure of proteins. Its solution is based on physical theories of hydrophobic interactions. The second problem is the conformational properties of proteins as the factor governing enzyme activity. The most direct methods for experimental investigation of questions in this area are optical, principally those involving natural and magnetic rotation of the plane of polarization. A substantial portion of the book concerns optical activity; the Faraday effect is discussed in an appendix. The third problem is the manifestation of the cooperative properties of enzymes in the kinetics of enzymatic reactions and the solution of complex kinetic problems. This problem is especially pressing in connection with research on allosteric enzymes, which are responsible for feedback in metabolic processes. An appendix describes a new method for solving kinetic problems, based on the theory of graphs. This volume extends and details certain of the ideas expressed in my previous book, Molecules and Life: An Introduction to Molecular Biophysics, which was published in this series in 1965.

Molecular Driving Forces

Ken Dill 2010-10-21

Molecular Driving Forces, Second Edition E-book is an introductory statistical thermodynamics text that describes the principles and forces that drive chemical and biological processes. It demonstrates how the complex behaviors of molecules can result from a few simple physical processes, and how simple models provide surprisingly accurate insights into the workings of the molecular world. Widely adopted in its First Edition, Molecular Driving Forces is regarded by teachers and students as an accessible textbook that illuminates underlying principles and concepts. The Second Edition includes two brand new chapters: (1) "Microscopic Dynamics" introduces single molecule experiments; and (2) "Molecular Machines" considers how nanoscale machines and engines work. "The Logic of Thermodynamics" has been expanded to its own chapter and now covers heat, work, processes, pathways, and cycles. New practical applications, examples, and end-of-chapter questions are integrated throughout the revised and updated text, exploring topics in biology, environmental and energy science, and nanotechnology. Written in a clear and reader-friendly style, the book provides an excellent introduction to the subject for novices while remaining a valuable resource for experts.

An Introduction to Human-Environment Geography

William G. Moseley 2013-08-05

This introductory level text explores various theoretical approaches to human-environment geography, demonstrating how local dynamics and global processes influence how we interact with our environments. Introduces students to fundamental concepts in environmental geography and science. Explores the core theoretical traditions within the field, along with major thematic issues such as population, food, and agriculture, and water resources. Offers an engaging and unique view of the spatial relationships between humans and their environment across geographical locations around the world. Includes a variety of real-world policy questions and emphasizes geography's strong tradition of field work by featuring prominent nature-society geographers in guest fieldnotes.

Applied Biophysics of Activated Water

Vladimir I. Vysotskii 2009-07-06

This book provides a detailed review of the modern theories dealing with the structure and properties of water. It also presents an analysis of the research on the effect of activated water on biological systems such as animals, microorganisms, and plants. The results of experiments on the influence of activated water on "pure" microbiological cultures and their natural associations are described, the studies being carried out under both aerobic and anaerobic conditions. The results demonstrate a significant influence of activated water on higher plants (vegetable crops), sterile plants, and callus tissues. It is shown that the activation of water under definite conditions gives rise to the appearance of very strong bactericidal properties: activated water inhibits the development of pathogenic microbiological cultures by tens and hundreds of times more strongly, and can be used for sterilization. In addition, a potent positive effect of activated water on the prevention and treatment of cancer in mice has been observed, and its efficacy compared to that of chemotherapy is discussed in the book. The information provided in this book is supported by intensive experimental data and developed theories. The research programs were conducted at the authors' laboratories in Ukraine and Russia as well as at research facilities located in the USA. Contents: Introduction to the Theory of Activated Water, Experimental Studies, Theoretical Studies, Biophysical Aspects, and Conclusion.
of Water Memory and General Principles of Water Activation
Molecular Resonance Effect Technology as the Basic Method for Activation of Liquid Substances
Study of the Physical Properties of MRET Activated Water
Influence of MRET Activated Water on the Growth of Higher Plants
Effects of MRET Activated Water on Microbial Culture and Natural Microbial Associations
Examination of the Influence of MRET Activated Water on Prophylaxis and Treatment of Oncology
Effect of MRET Activated Water on Staphylococcal Infection in vivo in Animal Model (on the Cells of Immune System) and in vitro on the Culture of Staphylococcus aureus
Wood-46
The Possible Mechanisms of Effects of Activated Water on Biological Systems
Conclusions and Recommendations
Readership: Biophysicists; physicists; medical doctors; researchers in molecular physics, hydrodynamics, optics, electrodynamics, condensed matter physics, microbiology, epidemiology and agriculture.
Key Features:
- Presents the results of complex experimental and theoretical studies of the characteristics of activated water obtained under a controlled action of the specific non-ionizing low-frequency electromagnetic emission on ordinary water
- Provides a comprehensive overview of the authors' work that includes innovative discoveries related to the effect of subtle, low-frequency, random magnetic fields on the molecular structure and physical properties of water
- Gives the results of the theoretical analysis of a possible mechanism of water memory and methods of its stimulation
Keywords: Activated Water; Water Memory; Biophysics; Bioengineering; Biotechnology; Treatment in Oncology; Inhibition of Pathogenic Culture Growth

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