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ISAIAS SHARP

Advances in Space Biology and Medicine National Academies Press

This report considers the development of Knowledge Networks and Markets and examines the impact of current initiatives and the possible options for governments, working with the private sector, to improve innovation efficiency and effectiveness.

DNA Coding, the Core of Life Sciences Springer Science & Business Media

For nearly a century, scientific advances have fueled progress in U.S. agriculture to enable American producers to deliver safe and abundant food domestically and provide a trade surplus in bulk and high-value agricultural commodities and foods. Today, the U.S. food and agricultural enterprise faces formidable challenges that will test its long-term sustainability, competitiveness, and resilience. On its current path, future productivity in the U.S. agricultural system is likely to come with trade-offs. The success of agriculture is tied to natural systems, and these systems are showing signs of stress, even more so with the change in climate. More than a third of the food produced is unconsumed, an unacceptable loss of food and nutrients at a time of heightened global food demand. Increased food animal production to meet greater demand will generate more greenhouse gas emissions and excess animal waste. The U.S. food supply is generally secure, but is not immune to the costly and deadly shocks of continuing outbreaks of food-borne illness or to the constant threat of pests and pathogens to crops, livestock, and poultry. U.S. farmers and producers are at the front lines and will need more tools to manage the pressures they face. *Science Breakthroughs to Advance Food and Agricultural Research by 2030* identifies innovative, emerging scientific advances for making the U.S. food and agricultural system more efficient, resilient, and sustainable. This report explores the availability of relatively new scientific developments across all disciplines that could accelerate progress toward these goals. It identifies the most promising scientific breakthroughs that could have the greatest positive impact on food and agriculture, and that are possible to achieve in the next decade (by 2030).

Life Sciences Industry Globe Fearon

Basic principles of applied life sciences such as recombinant DNA technology is used in most life sciences industries marketing bio-formulations for designing more effective protein-based drugs, such as erythropoietin and fast-acting insulin etc. In recent times genetically engineered host cells from mammal, animal and plants are also being used in life sciences industries to manufacture biologics. This book discusses the most basic as well advanced issues on biological products for successfully managing a life sciences industry. It elucidates the life cycle of biological molecules, right from the conceptual development of different types of biopolymers, and their subsequent transfer from the conical flasks in laboratory to life sciences industries for large scale production and marketing. It focuses on sustainable longevity in the life cycle of commercial biopolymers. Cumulative facts and figures in this volume would immensely help in inspiring life sciences industry promoters to monitor value chain transfer process of biologics for better profitability. Additionally, it would serve as a perusal document for the students and researchers interested in entrepreneurial ventures or having their own start-up projects for the commercialization of biologics.

Halakha and the Challenge of Israeli Sovereignty Springer Science & Business Media

America's position as the source of much of the world's global innovation has been the foundation of its economic vitality and military power in the post-war. No longer is U.S. pre-eminence assured as a place to turn laboratory discoveries into new commercial products, companies, industries, and high-paying jobs. As the pillars of the U.S. innovation system erode through wavering financial and policy support, the rest of the world is racing to improve its capacity to generate new technologies and products, attract and grow existing industries, and build positions in the high technology industries

of tomorrow. *Rising to the Challenge: U.S. Innovation Policy for Global Economy* emphasizes the importance of sustaining global leadership in the commercialization of innovation which is vital to America's security, its role as a world power, and the welfare of its people. The second decade of the 21st century is witnessing the rise of a global competition that is based on innovative advantage. To this end, both advanced as well as emerging nations are developing and pursuing policies and programs that are in many cases less constrained by ideological limitations on the role of government and the concept of free market economics. The rapid transformation of the global innovation landscape presents tremendous challenges as well as important opportunities for the United States. This report argues that far more vigorous attention be paid to capturing the outputs of innovation - the commercial products, the industries, and particularly high-quality jobs to restore full employment. America's economic and national security future depends on our succeeding in this endeavor.

Janice VanCleave's Super Science Challenges World Scientific Publishing Company

This volume addresses the overlapping aspects of the fields of genomics, obesity and (non-) medical ethics. It is unique in its examination of the implications of genomics for obesity from an ethical perspective. Genomics covers the sciences and technologies involved in the pathways that DNA takes until the organism is completely built and sustained: the range of genes (DNA), transcriptor factors, enhancers, promoters, RNA (copy of DNA), proteins, metabolism of cell, cellular interactions, organisms. Genomics offers a holistic approach, which, when applied to obesity, can have surprising and disturbing implications for the existing networks tackling this phenomenon. The ethical concerns and consideration presented are inspired by the interaction between the procedural perspective emphasizing the necessity of consultative and participatory organizational relationships in the new gray zones between medicine and food, and the substantive perspective that both cherishes individual autonomy and embeds it in socio-cultural contexts.

Business Modeling for Life Science and Biotech Companies National Academies Press

Mathematics for the Life Sciences provides present and future biologists with the mathematical concepts and tools needed to understand and use mathematical models and read advanced mathematical biology books. It presents mathematics in biological contexts, focusing on the central mathematical ideas, and providing detailed explanations. The author assumes no mathematics background beyond algebra and precalculus. Calculus is presented as a one-chapter primer that is suitable for readers who have not studied the subject before, as well as readers who have taken a calculus course and need a review. This primer is followed by a novel chapter on mathematical modeling that begins with discussions of biological data and the basic principles of modeling. The remainder of the chapter introduces the reader to topics in mechanistic modeling (deriving models from biological assumptions) and empirical modeling (using data to parameterize and select models). The modeling chapter contains a thorough treatment of key ideas and techniques that are often neglected in mathematics books. It also provides the reader with a sophisticated viewpoint and the essential background needed to make full use of the remainder of the book, which includes two chapters on probability and its applications to inferential statistics and three chapters on discrete and continuous dynamical systems. The biological content of the book is self-contained and includes many basic biology topics such as the genetic code, Mendelian genetics, population dynamics, predator-prey relationships, epidemiology, and immunology. The large number of problem sets include some drill problems along with a large number of case studies. The latter are divided into step-by-step problems and sorted into the appropriate section, allowing readers to gradually develop complete investigations from understanding the biological assumptions to a complete analysis.

Addressing Wicked Problems through Science Education Elsevier

A thoroughly updated and extended new edition of this well-regarded introduction to the basic

concepts of biological physics for students in the health and life sciences. Designed to provide a solid foundation in physics for students following health science courses, the text is divided into six sections: Mechanics, Solids and Fluids, Thermodynamics, Electricity and DC Circuits, Optics, and Radiation and Health. Filled with illustrative examples, Introduction to Biological Physics for the Health and Life Sciences, Second Edition features a wealth of concepts, diagrams, ideas and challenges, carefully selected to reference the biomedical sciences. Resources within the text include interspersed problems, objectives to guide learning, and descriptions of key concepts and equations, as well as further practice problems. NEW CHAPTERS INCLUDE: Optical Instruments Advanced Geometric Optics Thermodynamic Processes Heat Engines and Entropy Thermodynamic Potentials This comprehensive text offers an important resource for health and life science majors with little background in mathematics or physics. It is also an excellent reference for anyone wishing to gain a broad background in the subject. Topics covered include: Kinematics Force and Newton's Laws of Motion Energy Waves Sound and Hearing Elasticity Fluid Dynamics Temperature and the Zeroth Law Ideal Gases Phase and Temperature Change Water Vapour Thermodynamics and the Body Static Electricity Electric Force and Field Capacitance Direct Currents and DC Circuits The Eye and Vision Optical Instruments Atoms and Atomic Physics The Nucleus and Nuclear Physics Ionising Radiation Medical imaging Magnetism and MRI Instructor's support material available through companion website, www.wiley.com/go/biological_physics

Life Sciences and Related Fields Rowman & Littlefield

Antiarrhythmic Agents—Advances in Research and Application: 2012 Edition is a ScholarlyEditions™ eBook that delivers timely, authoritative, and comprehensive information about Antiarrhythmic Agents. The editors have built *Antiarrhythmic Agents—Advances in Research and Application: 2012 Edition* on the vast information databases of ScholarlyNews.™ You can expect the information about Antiarrhythmic Agents in this eBook to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of *Antiarrhythmic Agents—Advances in Research and Application: 2012 Edition* has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

An Introduction to Optimal Control Problems in Life Sciences and Economics CRC Press Combining control theory and modeling, this textbook introduces and builds on methods for simulating and tackling concrete problems in a variety of applied sciences. Emphasizing "learning by doing," the authors focus on examples and applications to real-world problems. An elementary presentation of advanced concepts, proofs to introduce new ideas, and carefully presented MATLAB® programs help foster an understanding of the basics, but also lead the way to new, independent research. With minimal prerequisites and exercises in each chapter, this work serves as an excellent textbook and reference for graduate and advanced undergraduate students, researchers, and practitioners in mathematics, physics, engineering, computer science, as well as biology, biotechnology, economics, and finance.

Global Bioethics Walter de Gruyter

This book discusses a number of ways in which out-of-school science education can uniquely engage learners with 'wicked' global problems such as biodiversity loss and climate change. The idea for the volume originated in discussions among members of the ESERA special interest group on "Science Education in Out-of-School contexts". It emerged from these discussions that out-of-school institutions and experiences offer opportunities for critical engagement in wicked problems that go far beyond what is possible solely in the science classroom. The book opens with a principled discussion of the nature of wicked problems and what addressing them involves. This introduction clarifies key terms and ideas to create a coherent backdrop for the rest of the book. Subsequent chapters discuss the challenges of designing educational experiences to address wicked problems, as well as the teaching and learning that takes place. The authors offer perspectives across a range of out-of-school environments such as science centres, natural history museums, botanical gardens, geological sites, and local communities. The book concludes with a chapter that synthesises the findings from the various contributions and points to the messages for educators. Finally, the editors outline an exciting research agenda to build knowledge of education addressing wicked problems. The intended audience of the book includes teachers, educators/facilitators, teacher educators, curriculum developers, and early career researchers as well as established researchers.

Issues in Life Sciences—Molecular Biology: 2013 Edition Springer Science & Business Media

Here's a first-of-its-kind book that bridges the gap between biomedical imaging and the bioscience community. This unique resource gives you a detailed understanding of imaging platforms, fluorescence imaging, and fundamental image processing algorithms. Further, it guides you through application of advanced image analysis methods and techniques to specific biological problems. The book presents applications that span a wide range of scales, from the detection of signaling events in sub-cellular structures, to the automated analysis of tissue structures. Other critical areas discussed include the dynamics of cell populations and in vivo microscopy. This cutting-edge volume is supported with over 160 illustrations that support key topics throughout the book. CD-ROM Included! Contains full-color images and videos that further illustrate topics discussed in the book.

Research at the Intersection of the Physical and Life Sciences Springer Science & Business Media

The book provides a unique collection of in-depth mathematical, statistical, and modeling methods and techniques for life sciences, as well as their applications in a number of areas within life sciences. The book provides also with a range of new ideas that represent emerging frontiers in life sciences where the application of such quantitative methods and techniques is becoming increasingly important. Many areas within life sciences are becoming increasingly quantitative and the progress in those areas will be more and more dependent on the successful development of advanced mathematical, statistical and modelling methodologies and techniques. The state-of-the-art developments in such methodologies and techniques are scattered throughout research journals and hardly accessible to the practitioners in those areas. This book identifies a number of frontier areas where such methodologies and techniques have recently been developed and are to be published here for the first time, bringing substantial potential benefit to a range of applications in life sciences. In addition, the book contains several state-of-the-art surveys at the interface of mathematics and life sciences that would benefit a larger interdisciplinary community. It is aimed at researchers in academia, practitioners and graduate students who want to foster interdisciplinary collaborations required to meet the challenges at the interface of modern life sciences and mathematics.

Postbiotics OECD Publishing

This fun-filled resource will help you discover how to answer these questions and more, and in the process, come up with your own great science projects. Janice VanCleave's Super Science Challenges gives you the ideas and information you need to start experimenting in a range of topics from astronomy, biology, and chemistry to earth science and physics. You can use these science

challenges as jumping off points for science fairs or classroom projects, or just try them at home for fun. The book is designed to show you how to use science inquiry to solve an exciting challenge.

Introduction to Biological Physics for the Health and Life Sciences Routledge

Nowadays inverse problems and applications in science and engineering represent an extremely active research field. The subjects are related to mathematics, physics, geophysics, geochemistry, oceanography, geography and remote sensing, astronomy, biomedicine, and other areas of applications. This monograph reports recent advances of inversion theory and recent developments with practical applications in frontiers of sciences, especially inverse design and novel computational methods for inverse problems. The practical applications include inverse scattering, chemistry, molecular spectra data processing, quantitative remote sensing inversion, seismic imaging, oceanography, and astronomical imaging. The book serves as a reference book and readers who do research in applied mathematics, engineering, geophysics, biomedicine, image processing, remote sensing, and environmental science will benefit from the contents since the book incorporates a background of using statistical and non-statistical methods, e.g., regularization and optimization techniques for solving practical inverse problems.

Nanotechnology for Chemical and Biological Defense Springer Science & Business Media

Biological collections are a critical part of the nation's science and innovation infrastructure and a fundamental resource for understanding the natural world. Biological collections underpin basic science discoveries as well as deepen our understanding of many challenges such as global change, biodiversity loss, sustainable food production, ecosystem conservation, and improving human health and security. They are important resources for education, both in formal training for the science and technology workforce, and in informal learning through schools, citizen science programs, and adult learning. However, the sustainability of biological collections is under threat. Without enhanced strategic leadership and investments in their infrastructure and growth many biological collections could be lost. *Biological Collections: Ensuring Critical Research and Education for the 21st Century* recommends approaches for biological collections to develop long-term financial sustainability, advance digitization, recruit and support a diverse workforce, and upgrade and maintain a robust physical infrastructure in order to continue serving science and society. The aim of the report is to stimulate a national discussion regarding the goals and strategies needed to ensure that U.S. biological collections not only thrive but continue to grow throughout the 21st century and beyond.

Biological Collections Springer Science & Business Media

Issues in Life Sciences—Invertebrate Research: 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Crustacean Biology. The editors have built *Issues in Life Sciences—Invertebrate Research: 2013 Edition* on the vast information databases of ScholarlyNews.™ You can expect the information about Crustacean Biology in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of *Issues in Life Sciences—Invertebrate Research: 2013 Edition* has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Issues in Life Sciences—Invertebrate Research: 2013 Edition John Wiley & Sons

The idea of form is one of the most fundamental concepts underlying all of the sciences. Our visual system is so well developed that we are able to effortlessly classify and compare visual images. What is not so well developed has been our ability to measure this visual information. This book examines a number of recent approaches currently in use to numerically characterize the biological form. It presents a unique overview of these methods, starting with a review of measurement set in a historical framework. The book will be of interest to graduate students in addition to a wide range of researchers, including those in the specialized fields of human biology, growth and development, orthodontics, botany, biology, ecology, zoology, as well as dentistry and medicine.

Deep Learning for the Life Sciences John Wiley & Sons

This is the first book to show the capabilities of Microsoft Excel to teach biological and life sciences statistics effectively. It is a step-by-step exercise-driven guide for students and practitioners who need to master Excel to solve practical science problems. If understanding statistics isn't your strongest suit, you are not especially mathematically-inclined, or if you are wary of computers, this is the right book for you. Excel, a widely available computer program for students and managers, is also an effective teaching and learning tool for quantitative analyses in science courses. Its powerful computational ability and graphical functions make learning statistics much easier than in years past. However, Excel 2010 for Biological and Life Sciences Statistics: A Guide to Solving Practical Problems is the first book to capitalize on these improvements by teaching students and managers how to apply Excel to statistical techniques necessary in their courses and work. Each chapter explains statistical formulas and directs the reader to use Excel commands to solve specific, easy-to-understand science problems. Practice problems are provided at the end of each chapter with their solutions in an appendix. Separately, there is a full Practice Test (with answers in an Appendix) that allows readers to test what they have learned.

Complexity in Chemistry and Beyond: Interplay Theory and Experiment Springer Science & Business Media

Issues in Life Sciences—Zoology / 2013 Edition is a ScholarlyEditions™ book that delivers timely, authoritative, and comprehensive information about Emu Research. The editors have built *Issues in Life Sciences—Zoology: 2013 Edition* on the vast information databases of ScholarlyNews.™ You can expect the information about Emu Research in this book to be deeper than what you can access anywhere else, as well as consistently reliable, authoritative, informed, and relevant. The content of *Issues in Life Sciences—Zoology / 2013 Edition* has been produced by the world's leading scientists, engineers, analysts, research institutions, and companies. All of the content is from peer-reviewed sources, and all of it is written, assembled, and edited by the editors at ScholarlyEditions™ and available exclusively from us. You now have a source you can cite with authority, confidence, and credibility. More information is available at <http://www.ScholarlyEditions.com/>.

Morphometrics For The Life Sciences John Wiley & Sons

This book analyses the history of the international patent regime and the life science industries, both of which can be traced back to the late 19th century. The development of patent law is inextricably linked to expanding capacities to elucidate, manipulate and commercially exploit the molecular properties of micro-organisms, plants, animals and other organic raw materials. The story of the life science industries begins with the European synthetic dyestuff firms and culminates in present-day conglomerates like Aventis, Novartis and Pharmacia. Throughout the last century, chemical, pharmaceutical, seed and biotechnology firms were actively involved in reforming patent law and plant variety rights. The major beneficiaries have been the largest firms whose market dominance and influence over peoples' lives - aided by friendly intellectual property laws - has never been greater. This sparkling and stimulating book reveals the key repercussions caused by the expansion of life science industries for issues of international equity, public health, food security and biological diversity.