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EDWARDS KAILEY

The Case of Nanotechnology Oxford University Press
The National Nanotechnology Initiative (NNI) is a multiagency, multidisciplinary federal initiative comprising a collection of research programs and other activities funded by the participating agencies and linked by the vision of "a future in which the ability to understand and control matter at the nanoscale leads to a revolution in technology and industry that benefits society." As first stated in the 2004 NNI strategic plan, the participating agencies intend to make progress in realizing that vision by working toward four goals. Planning, coordination, and management of the NNI are carried out by the interagency Nanoscale Science, Engineering, and Technology (NSET) Subcommittee of the National Science and Technology Council (NSTC) Committee on Technology (CoT) with support from the National Nanotechnology Coordination Office (NNCO). Triennial Review of the National Nanotechnology Initiative is the latest National Research Council review of the NNI, an assessment called for by the 21st Century Nanotechnology Research and Development Act of 2003. The overall objective of the review is to make recommendations to the NSET Subcommittee and the NNCO that will improve the NNI's value for basic and applied research and for development of applications in nanotechnology that will provide economic, societal, and national security benefits to the United States. In its assessment, the committee found it important to understand in some detail-and to describe in its report-the NNI's structure and organization; how the NNI fits within the larger federal research enterprise, as well as how it can and should be organized for management purposes; and the initiative's various stakeholders and their roles with respect to research. Because technology transfer, one of the four NNI goals, is dependent on management and coordination, the committee chose to address the topic of technology transfer last, following its discussion of definitions of success and metrics for assessing progress toward achieving the four goals and management and coordination. Addressing its tasks in this order would, the committee hoped, better reflect the logic of its approach to review of the NNI. Triennial Review of the National Nanotechnology Initiative also provides concluding remarks in the last chapter.
Encyclopedia of Nanoscience and Society National Academies Press
Preparation and Processing of Religious and Cultural Foods covers the production and processing of foods from major religions, focusing on the intersection of religion, science and cultural perceptions in the production and processing of modern religious and vegetarian foods. Quality control and authentication technologies are looked at in-depth, while nutrition, antioxidants, aging, hygiene and other long-term health factors are presented from a scientific standpoint. Bringing together the top scientific researchers on this essential topic of importance to a huge percentage of the world’s population, this book is ideal for food company innovation and R&D managers, producers and processers of religious foods. Religious groups have often been slow in implementing recent science and technology breakthroughs employed in the preparation, processing and packaging of various foods. This book provides a culturally sensitive coverage of these areas with an aim to encourage advancement. Covers the production and processing of major religious foods, namely Muslim, Christian, Jewish, Hindu and Buddhist Presents nutritional, antioxidant, aging, hygiene and other long-term health factors from a scientific standpoint Encourages advancement in the preparation, processing and packaging of religious foods using information cultivated from top scientific researchers in the field
What are the Federal Agencies Doing? : Hearing Before the Committee on Science, House of Representatives, One Hundred Ninth Congress, Second Session, September 21, 2006 Mango Media Inc.
Interdisciplinary research centers are blooming in almost every university, and interdisciplinary research is expected to be a cure-all for the ills of academic science. Do disciplines still matter? To what extent are interdisciplinary problem-solving approaches driven by socioeconomic stakeholders and policymakers rather than by academics? And how is interdisciplinarity organized? Through an in-depth sociological study of the development of nanomedicine in France and in the United States – an area that combines nanotechnology and biomedical research – this book challenges two conventional views of interdisciplinary research and academic disciplines. First, disciplines do not merely form separate "siloes" which hinder the development of interdisciplinary research: rather, they are flexible entities whose evolution supports the long-term institutionalization of interdisciplinary science in French and US academia. Secondly, interdisciplinary research has no intrinsic virtue: its ability to respond to societal issues and advance knowledge depends on continued political support and long-term cooperation between stakeholders. Interdisciplinarity might also be threatened by oversold promises and struggles for recognition. A study of the many challenges facing the formation of creative and sustainable interdisciplinary scientific communities, The Policies and Politics of Interdisciplinary Research tackles vivid debates among academics and research managers and will appeal to scholars of sociology, science and technology studies and science policy.
Ethics in Nanotechnology CRC Press
Nanotechnology & Society is a collection of sixteen papers focused on the most urgent issues arising from nanotechnology today and in the near future. Written by leading researchers, policy experts, and nanoethics scholars worldwide, the book is divided into five units: foundational issues; risk and regulation; industry and policy; the human condition; and selected global issues. The essays tackle such contentious issues as environmental impact, health dangers, medical benefits, intellectual

property, professional code of ethics, privacy, international governance, and more.

Preparation and Processing of Religious and Cultural Foods Springer Science & Business Media

With nanotechnology being a relatively new field, the questions regarding safety and ethics are steadily increasing with the development of the research. This book aims to give an overview on the ethics associated with employing nanoscience for products with everyday applications. The risks as well as the regulations are discussed, and an outlook for the future of nanoscience on a manufacturer's scale and for the society is provided. Handbook of Nanoethics is perfect for , academicians and scientist, as well as all other industry professionals and researchers. It is a good introduction for newcomers in the field who do not want to dive deep into the details but are eager to understand the ethical challenges and possible solution related to nanotechnology and ethics.

A Journey from the Past to the Edge of Tomorrow Springer Science & Business Media

This is the first complete edited volume devoted to providing comprehensive and state-of-the art descriptions of science principles and pilot- and field-scaled engineering applications of nanoscale zerovalent iron particles (NZVI) for soil and groundwater remediation. Although several books on environmental nanotechnology contain chapters of NZVI for environmental remediation (Wiesner and Bottero (2007); Geiger and Carvalho-Knighton (2009); Diallo et al. (2009); Ram et al. (2011)), none of them include a comprehensive treatment of the fundamental and applied aspects of NZVI applications. Most devote a chapter or two discussing a contemporary aspect of NZVI. In addition, environmental nanotechnology has a broad audience including environmental engineers and scientists, geochemists, material scientists, physicists, chemists, biologists, ecologists and toxicologists. None of the current books contain enough background material for such multidisciplinary readers, making it difficult for a graduate student or even an experienced researcher or environmental remediation practitioner new to nanotechnology to catch up with the massive, undigested literature. This prohibits the reader from gaining a complete understanding of NZVI science and technology. In this volume, the sixteen chapters are based on more than two decades of laboratory research and development and field-scaled demonstrations of NZVI implementation. The authors of each chapter are leading researchers and/or practitioners in NZVI technology. This book aims to be an important resource for all levels of audiences, i.e. graduate students, experienced environmental and nanotechnology researchers, and practitioners evaluating environmental remediation, as it is designed to involve everything from basic to advanced concepts.

Future Rising Springer

Public policy analysts and political pundits alike tend to describe the policymaking process as a reactive sequence in which government develops solutions for clearly evident and identifiable problems. While this depiction holds true in many cases, it fails to account for instances in which public policy is enacted in anticipation of a potential future problem. Whereas traditional policy concerns manifest themselves through ongoing harms, "anticipatory problems" are projected to occur sometime in the future, and it is the prospect of their potentially catastrophic impact that generates intense speculation and concern in the present. Anticipatory Policymaking: When Government Acts to Prevent Problems and Why It Is So Difficult provides an in depth examination of the complex process through which United States government institutions anticipate emerging threats. Using contemporary debates over the risks associated with nanotechnology, pandemic influenza, and global warming as case study material, Rob A. DeLeo highlights the distinctive features of proactive governance. By challenging the pervasive assumption of reactive policymaking, DeLeo provides a dynamic approach for conceptualizing the political dimensions of anticipatory policy change.

Sustainable Planet: Issues and Solutions for our Environment's Future [2 volumes] Cambridge University Press

Nanotechnology Environmental Health and SafetyRisks, Regulation, and ManagementWilliam Andrew

Nanotechnology Research in the US Agri-food Sectoral System of Innovation Walter de Gruyter GmbH & Co KG

The 3rd International Symposium on Nanotechnology in Construction (NICOM 3) follows the highly successful NICOM 1 (Paisley, UK 2003) and NICOM 2 (Bilbao, Spain 2005) Symposia. The NICOM3 symposium was held in Prague, Czech Republic from May 31 to June 2, 2009 under the auspices of the Czech Technical University in Prague. It was a cross-disciplinary event, bringing together R&D experts and users from different fields all with interest in nanotechnology and construction. The conference was aimed at: Understanding of internal structures of existing construction materials at nano-scale Modification at nano-scale of existing construction materials. Production and properties of nanoparticulate materials, nanotubes and novel polymers. Modeling and simulation of nanostructures. Instrumentation, techniques and metrology at nano-scale. Health and safety issues and environmental impacts related to nanotechnology during research, manufacture and product use. Review of current legislation. Societal and commercial impacts of nanotechnology in construction, their predictions and analysis.

Hearings Before a Subcommittee of the Committee on Appropriations, House of Representatives, One Hundred Ninth Congress, First Session Springer

The governance of emerging technologies does not follow a single governance paradigm because of complex interactions between government, industry, and civil actors. In this Element, we will argue that for emerging technologies, governance is a 'convergent paradigm'. We introduce governance issues associated with emerging technologies generally before turning to the specifics of nanotechnology. We then approach governance theory and practice by considering different perspectives on governance by their different orientations with respect to object and process. Finally, we construct a matrix of object and process oriented governance activities observed in the case of nanotechnology in the United States.

The Handbook of Emergent Technologies in Social Research ABC-CLIO

With the introduction of the 2030 Agenda for Sustainable Development by the United Nations General Assembly in 25 September 2015, UN agencies, member states and stakeholders have begun to focus on the adoption and implementation of these strategies in realization of 17 Sustainable Development Goals. To work toward sustainability, strategic measures to encourage stakeholders to contribute to the goals of the 2030 agenda are needed. In recognition of these efforts, this book is produced to compile research concepts and approaches for the area of sustainability management of industry, technology development, community, education and the environment. The objective of this book is to deliberate concepts and approaches of sustainability management taking place in Malaysia whereby case studies will be revealed to provide way forward of sustainability

management toward achieving sustainable development. The insights provided can be applied to advanced and developing countries by sustainable development practitioners, encompassing government agencies, academia, industries, NGOs and community, who would like to adopt the concept of approach of sustainability into their area of management.

Introduction to Nanoscience and Nanotechnology Nanotechnology Environmental Health and SafetyRisks, Regulation, and Management

A Compelling Vision of the Future Maynard has written a thoughtful and thought-provoking response to the moment we’re in, chronicling how we got here, where we’re going, and what role we have in that journey forward”. —Ramona Pringle, Director of Creative Innovation Studio and Associate Professor, Ryerson University #1 New Release in Science & Math Human beings can—and do—change the future. Over the course of the past 14 billion years, humanity has gained the ability not only to imagine the future, but to design and engineer it. At times entertaining and at others profound, Future Rising by Dr. Andrew Maynard, professor in the School for the Future of Innovation in Society at ASU, provides a highly original perspective on our relationship with the future. We have a responsibility to change the future for the better. As a species, we have become profoundly talented architects of our own future. And yet, we so often struggle to come to terms with what this means and the responsibility that comes with this ability. As our world is driven along by the breakneck speed of innovation and rapidly-shifting norms and expectations, we sometimes need to find a still, quiet place to pause and think. Future Rising sets out to create such a quiet place, where we can take advantage of our species' knowledge of the environment, world history, and the importance of science to piece together a positive picture of the future. To create a good future, rediscover the past. Our relationship with the future is inextricably intertwined with where we've come from, who we are, and what we aspire to. Written to be easy to pick up and hard to put down, Future Rising starts at the beginning of all things with the Big Bang and traces a pathway along the emergence of intelligent life, through what makes humans uniquely capable of imagining and creating different futures, to the profound responsibilities that this comes with. In a series of sixty short reflections, Future Rising will take you on an often-startling journey into: • What "the future" actually is • How it molds and guides our lives • How we can use the history of the world to change our future If you enjoy nonfiction science and history books like Until the End of Time, Humble Math, or When, then you'll love Future Rising.

Risks, Regulation, and Management William Andrew

Nanotechnology is increasingly used in the food industry in the production, processing, packaging, and preservation of foods. It is also used to enhance flavor and color, nutrient delivery, and bioavailability, and to improve food safety and in quality management. Nanotechnology Applications in the Food Industry is a comprehensive reference book containing exhaustive information on nanotechnology and the scope of its applications in the food industry. The book has five sections delving on all aspects of nanotechnology and its key role in food industry in the present scenario. Part I on Introduction to Nanotechnology in Food Sector covers the technological basis for its application in food industry and in agriculture. The use of nanosized foods and nanomaterials in food, the safety issues pertaining to its applications in foods and on market analysis and consumer perception of food nanotechnology has been discussed in the section. Part II on Nanotechnology in Food Packaging reviews the use of nanopolymers, nanocomposites and nanostructured coatings in food packaging. Part III on Nanosensors for Safe and Quality Foods provides an overview on nanotechnology in the development of biosensors for pathogen and food contaminant detections, and in sampling and food quality management. Part IV on Nanotechnology for Nutrient Delivery in Foods deals with the use of nanotechnology in foods for controlled and effective release of nutrients. Part V on Safety Assessment for Use of Nanomaterials in Food and Food Production deliberates on the benefits and risks associated with the extensive and long term applications of nanotechnology in food sector.

Commerce, Justice, Science, and Related Agencies Appropriations for 2008 John Wiley & Sons

The past half-century has witnessed a dramatic increase in the scale and complexity of scientific research. The growing scale of science has been accompanied by a shift toward collaborative research, referred to as "team science." Scientific research is increasingly conducted by small teams and larger groups rather than individual investigators, but the challenges of collaboration can slow these teams' progress in achieving their scientific goals. How does a team-based approach work, and how can universities and research institutions support teams? Enhancing the Effectiveness of Team Science synthesizes and integrates the available research to provide guidance on assembling the science team; leadership, education and professional development for science teams and groups. It also examines institutional and organizational structures and policies to support science teams and identifies areas where further research is needed to help science teams and groups achieve their scientific and translational goals. This report offers major public policy recommendations for science research agencies and policymakers, as well as recommendations for individual scientists, disciplinary associations, and research universities. Enhancing the Effectiveness of Team Science will be of interest to university research administrators, team science leaders, science faculty, and graduate and postdoctoral students.

Science, the Departments of State, Justice, and Commerce, and Related Agencies Appropriations for 2006 Walter de Gruyter GmbH & Co KG

The maturation of nanotechnology has revealed it to be a unique and distinct discipline rather than a specialization within a larger field. Its textbook cannot afford to be a chemistry, physics, or engineering text focused on nano. It must be an integrated, multidisciplinary, and specifically nano textbook. The archetype of the modern nano textbook, Introduction to Nanoscience and Nanotechnology builds a solid background in characterization and fabrication methods while integrating the physics, chemistry, and biology facets. The remainder of this color text focuses on applications, examining engineering aspects as well as nanomaterials and industry-specific applications in such areas as energy, electronics, and biotechnology. Also available in two course-specific volumes: Introduction to Nanoscience elucidates the nanoscale along with the societal impacts of nanoscience, then presents an overview of characterization and fabrication methods. The authors systematically discuss the chemistry, physics, and biology aspects of nanoscience, providing a complete picture of the challenges, opportunities, and inspirations posed by each facet before giving a brief glimpse at nanoscience in action: nanotechnology. Fundamentals of Nanotechnology surveys the field’s broad landscape, exploring the physical basics such as nanorheology, nanofluidics, and

nanomechanics as well as industrial concerns such as manufacturing, reliability, and safety. The authors then explore the vast range of nanomaterials and systematically outline devices and applications in various industrial sectors. Qualifying instructors who purchase either of these volumes (or the combined set) are given online access to a wealth of instructional materials. These include detailed lecture notes, review summaries, slides, exercises, and more. The authors provide enough material for both one- and two-semester courses.

The Policies and Politics of Interdisciplinary Research SAGE

Nanoscale science, engineering, and technology, often referred to simply as "nanotechnology," is the understanding, characterization, and control of matter at the scale of nanometers, the dimension of atoms and molecules. Advances in nanotechnology promise new materials and structures that are the basis of solutions, for example, for improving human health, optimizing available energy and water resources, supporting a vibrant economy, raising the standard of living, and increasing national security. Established in 2001, the National Nanotechnology Initiative (NNI) is a coordinated, multiagency effort with the mission to expedite the discovery, development, and deployment of nanoscale science and technology to serve the public good. This report is the latest triennial review of the NNI called for by the 21st Century Nanotechnology Research and Development Act of 2003. It examines and comments on the mechanisms in use by the NNI to advance focused areas of nanotechnology towards advanced development and commercialization and on the physical and human infrastructure needs for successful realization in the United States of the benefits of nanotechnology development.

Enhancing the Effectiveness of Team Science Woodhead Publishing

The National Nanotechnology Initiative (NNI) was created in 2000 to focus and coordinate the nanoscience and nanotechnology research and development (R&D) activities being funded by several federal agencies. The purpose of the NNI is to marshal these research activities in order to accelerate responsible development and deployment of nanotechnology for economic benefit and national security. To take stock of the progress of the NNI, Congress, in P. L. 108-153, the 21st Century Nanotechnology Research and Development Act, directed the National Research Council to carry out a review of the program every three years. This report presents the results of the first of those reviews, which addresses the economic impact of nanotechnology developments and provides a benchmark of U.S. R&D efforts relative to those undertaken by foreign competitors. In addition, the report offers an assessment of the current status of responsible development of nanotechnology and comments on the feasibility of molecular self-assembly.

Commerce, Justice, Science, and Related Agencies Appropriations for Fiscal Year 2007 University of Michigan Press

A fascinating and informative look at state-of-the-art nanotechnology research, worldwide, and its vast commercial potential Nanotechnology Commercialization: Manufacturing Processes and Products presents a detailed look at the state of the art in nanotechnology and explores key issues that must still be addressed in order to successfully commercialize that vital technology. Written by a team of distinguished experts in the field, it covers a range of applications notably: military, space, and commercial transport applications, as well as applications for missiles, aircraft, aerospace, and commercial transport systems. The drive to advance the frontiers of nanotechnology has become a major global initiative with profound economic, military, and environmental implications. Nanotechnology has tremendous commercial and economic implications with a projected $ 1.2 trillion-dollar global market. This book describes current research in the field and details its commercial potential—from work bench to market. Examines the state of the art in nanotechnology and explores key issues surrounding its commercialization Takes a real-world approach, with chapters written from a practical viewpoint, detailing the latest research and considering its potential commercial and defense applications Presents the current research and proposed applications of nanotechnology in such a way as to stimulate further research and development of new applications Written by an all-star team of experts, including pioneer patent-holders and award-winning researchers in nanotechnology The major challenge currently faced by researchers in nanotechnology is successfully transitioning laboratory research into viable commercial products for the 21st century. Written for professionals across an array of research and engineering disciplines, Nanotechnology Commercialization: Manufacturing Processes and Products does much to help them bridge the gap between lab and marketplace.

Nanomedicine in France and in the United States John Wiley & Sons

Labeled either as the "next industrial revolution" or as just "hype," nanoscience and nanotechnologies are controversial, touted by some as the likely engines of spectacular transformation of human societies and even human bodies, and by others as conceptually flawed. These challenges make an encyclopedia of nanoscience and society an absolute necessity. Providing a guide to what these understandings and challenges are about, the Encyclopedia of Nanoscience and Society offers accessible descriptions of some of the key technical achievements of nanoscience along with its history and prospects. Rather than a technical primer, this encyclopedia instead focuses on the efforts of governments around the world to fund nanoscience research and to tap its potential for economic development as well as to assess how best to regulate a new technology for the environmental, occupational, and consumer health and safety issues related to the field. Contributions examine and analyze the cultural significance of nanoscience and nanotechnologies and describe some of the organizations, and their products, that promise to make nanotechnologies a critical part of the global economy. Written by noted scholars and practitioners from around the globe, these two volumes offer nearly 500 entries describing the societal aspects of nanoscience and nanotechnology. Key Themes - Art, Design, and Materials - Bionanotechnology Centers - Context - Economics and Business - Engagement and the Public - Environment and Risk - Ethics and Values - Geographies and Distribution - History and Philosophy - Integration and Interdisciplinarity - Nanotechnology Companies - Nanotechnology Organizations

Springer Handbook of Nanotechnology National Academies Press

Comprehensive Toxicology, Third Edition, discusses chemical effects on biological systems, with a focus on understanding the mechanisms by which chemicals induce adverse health effects. Organized by organ system, this comprehensive reference work addresses the toxicological effects of chemicals on the immune system, the hematopoietic system, cardiovascular system, respiratory system, hepatic toxicology, renal toxicology, gastrointestinal toxicology, reproductive and endocrine toxicology, neuro and

behavioral toxicology, developmental toxicology and carcinogenesis, also including critical sections that cover the general principles of toxicology, cellular and molecular toxicology, biotransformation and toxicology testing and evaluation. Each section is examined in state-of-the-art chapters written by domain experts, providing key information to support the investigations of researchers across the medical, veterinary, food, environment and chemical research industries, and national and international regulatory agencies. Thoroughly revised and expanded to 15 volumes that include the latest advances in research, and uniquely organized by organ system for ease of reference and diagnosis, this new edition is an essential reference for researchers of toxicology. Organized to cover both the fundamental principles of toxicology and unique aspects of major organ systems Thoroughly revised to include the latest advances in the toxicological effects of chemicals on the immune system Features additional coverage throughout and a new volume on toxicology of the hematopoietic system Presents in-depth, comprehensive coverage from an international author base of domain experts