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The mystique of biologically inspired (or bioinspired) paradigms is their ability to describe and solve complex relationships from intrinsically very simple initial conditions and with little or no knowledge of the search space. Edited by two prominent, well-respected researchers, the Handbook of Bioinspired Algorithms and Applications reveals the

The first historical study of export control regulations as a tool for the sharing and withholding of knowledge. In this groundbreaking book, Mario Daniels and John Krige set out to show the enormous political relevance that export control regulations have had for American debates about national security, foreign policy, and

trade policy since 1945. Indeed, they argue that from the 1940s to today the issue of how to control the transnational movement of information has been central to the thinking and actions of the guardians of the American national security state. The expansion of control over knowledge and know-how is apparent from the increasingly systematic inclusion of universities and research institutions into a system that in the 1950s and 1960s mainly targeted business activities. As this book vividly reveals, classification was not the only—and not even the most important—regulatory instrument that came into being in the postwar era.

NOTE: NO FURTHER DISCOUNT FOR THIS PRINT PRODUCT- OVERSTOCK SALE-- Significantly re-

duced list price This new book from the NASA History Series tackles an interesting duo of biological problems that will be familiar to anybody who has seen photos of Apollo astronauts quarantined after their return to Earth. Namely, how do we avoid contaminating celestial bodies with Earthly germs when we send spacecraft to study these bodies, and how do we avoid spreading foreign biological matter from space when our robotic and human spacefarers return to Earth? Biological matter from an external system could potentially cause an unchecked epidemic either on Earth or in space so strict precautions are necessary. Each time a space vehicle visits another world it runs the risk of forever changing that extraterrestrial environment. We are

surrounded on Earth by a melange of different microorganisms, and if some of these hitchhike on-board a space mission, they could contaminate and start colonies on a different planet. Such an occurrence would irrevocably alter the nature of that world, compromise all future scientific exploration of the body, and possibly damage any extant life on it. By inadvertently carrying exotic organisms back to Earth on our spacecraft, we also risk the release of biohazardous materials into our own ecosystem. Such concerns were recognized by scientists even before the 1957 launch of Sputnik. This book presents the history of planetary protection by tracing the responses to the above concerns on NASA's missions to the Moon, Mars, Venus, Jupiter, Saturn, and many smaller bodies of our solar system. The book relates the extensive efforts put forth by NASA to plan operations and prepare space vehicles that return exemplary science without contaminating the biospheres of other worlds or our own. To protect irreplaceable environments, NASA has committed to conducting space exploration in a manner that is protective of the bodies

visited, as well as of our own planet."

Despite the increase in funding for research and the rising numbers of peer-reviewed publications over the past decade that address the environmental, health, and safety aspects of engineered nanomaterials (ENMs), uncertainty about the implications of potential exposures of consumers, workers, and ecosystems to these materials persists. Consumers and workers want to know which of these materials they are exposed to and whether the materials can harm them. Industry is concerned about being able to predict with sufficient certainty whether products that it makes and markets will pose any environmental, health or safety issues and what measures should be taken regarding manufacturing practices and worldwide distribution to minimize any potential risk. However, there remains a disconnect between the research that is being carried out and its relevance to and use by decision-makers and regulators to make informed public health and environmental policy and regulatory decisions. Research Progress on Environmental, Health, and Safety Aspects of

Nanomaterials evaluates research progress and updates research priorities and resource estimates on the basis of results of studies and emerging trends in the nanotechnology industry. This report follows up the 2012 report A Research Strategy for Environmental, Health, and Safety Aspects of Engineered Nanomaterials, which presented a strategic approach for developing the science and research infrastructure needed to address uncertainties regarding the potential environmental, health, and safety risks posed by ENMs. This new report looks at the state of nanotechnology research, examines market and regulatory conditions and their affect on research priorities, and considers the criteria for evaluating research progress on the environmental, health, and safety aspects of nanotechnology.

A leading member of the Senate Judiciary Committee "spells out, in considerable detail, the extent of corporate influence over a variety of issues" in national politics (The New Yorker) As a U.S. senator and former federal prosecutor, Sheldon Whitehouse has had a front-row seat for the spectacle of dark mon-

ey in government. In his widely praised book *Captured*, he describes how corporations buy influence over our government—not only over representatives and senators, but over the very regulators directly responsible for enforcing the laws under which these corporations operate, and over the judges and prosecutors who are supposed to be vigilant about protecting the public interest. In a case study that shows these operations at work, *Whitehouse* reveals how fossil fuel companies have held any regulation related to climate change at bay. The problem is structural: as *Kirkus Reviews* wrote, "many of the ills it illuminates are bipartisan." This paperback edition features a new preface by the author that reveals how corporate influence has taken advantage of Donald Trump's presidency to advance its agenda—and what we can do about it.

"Doubt is our product," a cigarette executive once observed, "since it is the best means of competing with the 'body of fact' that exists in the minds of the general public. It is also the means of establishing a controversy." In this eye-opening expose, David Michaels reveals how the

tobacco industry's duplicitous tactics spawned a multimillion dollar industry that is dismantling public health safeguards. Product defense consultants, he argues, have increasingly skewed the scientific literature, manufactured and magnified scientific uncertainty, and influenced policy decisions to the advantage of polluters and the manufacturers of dangerous products. To keep the public confused about the hazards posed by global warming, second-hand smoke, asbestos, lead, plastics, and many other toxic materials, industry executives have hired unscrupulous scientists and lobbyists to dispute scientific evidence about health risks. In doing so, they have not only delayed action on specific hazards, but they have constructed barriers to make it harder for lawmakers, government agencies, and courts to respond to future threats. The Orwellian strategy of dismissing research conducted by the scientific community as "junk science" and elevating science conducted by product defense specialists to "sound science" status also creates confusion about the very nature of scientific inquiry and un-

dermines the public's confidence in science's ability to address public health and environmental concerns. Such reckless practices have long existed, but Michaels argues that the Bush administration deepened the dysfunction by virtually handing over regulatory agencies to the very corporate powers whose products and behavior they are charged with overseeing. In *Doubt Is Their Product* Michaels proves, beyond a doubt, that our regulatory system has been broken. He offers concrete, workable suggestions for how it can be restored by taking the politics out of science and ensuring that concern for public safety, rather than private profits, guides our regulatory policy. Named one of the best Sci-Tech books of 2008 by *Library Journal*!

The integrity of knowledge that emerges from research is based on individual and collective adherence to core values of objectivity, honesty, openness, fairness, accountability, and stewardship. Integrity in science means that the organizations in which research is conducted encourage those involved to exemplify these values in every step of the research process. Understanding the dynamics that

support " or distort " practices that uphold the integrity of research by all participants ensures that the research enterprise advances knowledge. The 1992 report *Responsible Science: Ensuring the Integrity of the Research Process* evaluated issues related to scientific responsibility and the conduct of research. It provided a valuable service in describing and analyzing a very complicated set of issues, and has served as a crucial basis for thinking about research integrity for more than two decades. However, as experience has accumulated with various forms of research misconduct, detrimental research practices, and other forms of misconduct, as subsequent empirical research has revealed more about the nature of scientific misconduct, and because technological and social changes have altered the environment in which science is conducted, it is clear that the framework established more than two decades ago needs to be updated. *Responsible Science* served as a valuable benchmark to set the context for this most recent analysis and to help guide the committee's thought process. *Fostering Integrity in Research*

identifies best practices in research and recommends practical options for discouraging and addressing research misconduct and detrimental research practices.

A personal account of the implementation of a controversial credit transfer program at the nation's third-largest university *Change* is notoriously difficult in any large organization. Institutions of higher education are no exception. From 2010 to 2013, Alexandra Logue, then chief academic officer of The City University of New York, led a controversial reform initiative known as Pathways. The program aimed to facilitate the transfer of credits among the university's nineteen constituent colleges in order to improve graduation rates—a long-recognized problem for public universities such as CUNY. Hotly debated, Pathways met with vociferous resistance from many faculty members, drew the attention of local and national media, and resulted in lengthy legal action. In *Pathways to Reform*, Logue, the figure at the center of the maelstrom, blends vivid personal narrative with an objective perspective to tell how this hard-fought plan was successfully implemented

at the third-largest university in the United States. Logue vividly illustrates why change does or does not take place in higher education, and the professional and personal tolls exacted. Looking through the lens of the Pathways program and factoring in key players, she analyzes how governance structures and conflicting interests, along with other institutional factors, impede change—which, Logue shows, is all too rare, slow, and costly. In this environment, she argues, it is shared governance, combined with a strong, central decision-making authority, that best facilitates necessary reform. Logue presents a compelling investigation of not only transfer policy but also power dynamics and university leadership. Shedding light on the inner workings of one of the most important public institutions in the nation, *Pathways to Reform* provides the first full account of how, despite opposition, a complex higher education initiative was realized. All net royalties received by the author from sales of this book will be donated to The City University of New York to support undergraduate student financial aid.

Research and innovation in the life sciences is driving rapid growth in agriculture, biomedical science, information science and computing, energy, and other sectors of the U.S. economy. This economic activity, conceptually referred to as the bioeconomy, presents many opportunities to create jobs, improve the quality of life, and continue to drive economic growth. While the United States has been a leader in advancements in the biological sciences, other countries are also actively investing in and expanding their capabilities in this area. Maintaining competitiveness in the bioeconomy is key to maintaining the economic health and security of the United States and other nations. Safeguarding the Bioeconomy evaluates pre-existing and potential approaches for assessing the value of the bioeconomy and identifies intangible assets not sufficiently captured or that are missing from U.S. assessments. This study considers strategies for safeguarding and sustaining the economic activity driven by research and innovation in the life sciences. It also presents ideas for horizon scanning mechanisms to identify new technologies, markets,

and data sources that have the potential to drive future development of the bioeconomy.

The classic case for why government must support science—with a new essay by physicist and former congressman Rush Holt on what democracy needs from science today. Science, the Endless Frontier is recognized as the landmark argument for the essential role of science in society and government's responsibility to support scientific endeavors. First issued when Vannevar Bush was the director of the US Office of Scientific Research and Development during the Second World War, this classic remains vital in making the case that scientific progress is necessary to a nation's health, security, and prosperity. Bush's vision set the course for US science policy for more than half a century, building the world's most productive scientific enterprise. Today, amid a changing funding landscape and challenges to science's very credibility, Science, the Endless Frontier resonates as a powerful reminder that scientific progress and public well-being alike depend on the successful symbiosis between science and gov-

ernment. This timely new edition presents this iconic text alongside a new companion essay from scientist and former congressman Rush Holt, who offers a brief introduction and consideration of what society needs most from science now. Reflecting on the report's legacy and relevance along with its limitations, Holt contends that the public's ability to cope with today's issues—such as public health, the changing climate and environment, and challenging technologies in modern society—requires a more capacious understanding of what science can contribute. Holt considers how scientists should think of their obligation to society and what the public should demand from science, and he calls for a renewed understanding of science's value for democracy and society at large. A touchstone for concerned citizens, scientists, and policymakers, Science, the Endless Frontier endures as a passionate articulation of the power and potential of science.

The United States' tradition of conserving fish, wildlife, habitats, and cultural resources dates to the mid-19th century. States have long sought to manage fish and

wildlife species within their borders, whereas many early federal conservation efforts focused on setting aside specific places as parks, sanctuaries, or reserves. With advances in landscape ecology over the past quarter-century, conservation planners, scientists, and practitioners began to stress the importance of conservation efforts at the scale of landscapes and seascapes. These larger areas were thought to harbor relatively large numbers of species that are likely to maintain population viability and sustain ecological processes and natural disturbance regimes - often considered critical factors in conserving biodiversity. By focusing conservation efforts at the level of whole ecosystems and landscape, practitioners can better attempt to conserve the vast majority of species in a particular ecosystem. Successfully addressing the large-scale, interlinked problems associated with landscape degradation will necessitate a planning process that bridges different scientific disciplines and across sectors, as well as an understanding of complexity, uncertainty, and the local context of conservation work. The lands-

cape approach aims to develop shared conservation priorities across jurisdictions and across many resources to create a single, collaborative conservation effort that can meet stakeholder needs. Conservation of habitats, species, ecosystem services, and cultural resources in the face of multiple stressors requires governance structures that can bridge the geographic and jurisdictional boundaries of the complex socio-ecological systems in which landscape-level conservation occurs. The Landscape Conservation Cooperatives (LCC) Network was established to complement and add value to the many ongoing state, tribal, federal, and nongovernmental efforts to address the challenge of conserving species, habitats, ecosystem services, and cultural resources in the face of large-scale and long-term threats, including climate change. A Review of the Landscape Conservation Cooperatives evaluates the purpose, goals, and scientific merits of the LCC program within the context of similar programs, and whether the program has resulted in measurable improvements in the health of fish, wildlife, and their habitats.

Providing an overview of the process of e-inclusion for older people and addressing the ethical, social and legal aspects of the process, this book is suitable for researchers, policy-makers, organisations and companies, as well as for those with an interest in the identification and promotion of good practice within an ageing society.

The classic teaching toolbox, updated with new research and ideas Teaching at Its Best is the best-selling, research-based toolbox for college instructors at any level, in any higher education setting. Packed with practical guidance, proven techniques, and expert perspectives, this book helps instructors improve student learning both face-to-face and online. This new fourth edition features five new chapters on building critical thinking into course design, creating a welcoming classroom environment, helping students learn how to learn, giving and receiving feedback, and teaching in multiple modes, along with the latest research and new questions to facilitate faculty discussion. Topics include new coverage of the flipped classroom, cutting-edge technologies,

self-regulated learning, the mental processes involved in learning and memory, and more, in the accessible format and easy-to-understand style that has made this book a much-valued resource among college faculty. Good instructors are always looking for ways to improve student learning. With college classrooms becoming increasingly varied by age, ability, and experience, the need for fresh ideas and techniques has never been greater. This book provides a wealth of research-backed practices that apply across the board. Teach students practical, real-world problem solving Interpret student ratings accurately Boost motivation and help students understand how they learn Explore alternative techniques, formats, activities, and exercises Given the ever-growing body of research on student learning, faculty now have many more choices of effective teaching strategies than they used to have, along with many more ways to achieve excellence in the classroom. Teaching at Its Best is an invaluable toolbox for refreshing your approach, and providing the exceptional education your students deserve.

Growing Up America brings together new scholarship that considers the role of children and teenagers in shaping American political life during the decades following the Second World War. Growing Up America places young people—and their representations—at the center of key political trends, illuminating the dynamic and complex roles played by youth in the midcentury rights revolutions, in constructing and challenging cultural norms, and in navigating the vicissitudes of American foreign policy and diplomatic relations. The authors featured here reveal how young people have served as both political actors and subjects from the early Cold War through the late twentieth-century Age of Fracture. At the same time, Growing Up America contends that the politics of childhood and youth extends far beyond organized activism and the ballot box. By unveiling how science fairs, breakfast nooks, Boy Scout meetings, home economics classrooms, and correspondence functioned as political spaces, this anthology encourages a reassessment of the scope and nature of modern politics itself. Rich in historical detail

and theoretical insight, Wars of Revelation explains why the United States' military interventions have repeatedly transformed its global role - and what that means for the future of American grand strategy. More than seventy-five years since the end of World War II, military interventions - rather than major wars - have emerged as a defining feature of contemporary geopolitics. Yet, for all the fierce policy debates over interventions and their lessons, scholars have largely ignored the systematic linkages between these smaller-scale wars and transformations in the grand strategies of states that prosecute them. In Wars of Revelation, Rebecca Lissner explains why military interventions can be crucibles of grand strategy, testing strategic axioms on the battlefield and prompting combatant states to reconceive their global roles. Through detailed historical case studies of US involvement in the Korean, Vietnam, and Persian Gulf Wars, Lissner shows how each intervention generated searing insights into the capabilities and intentions of America's international adversaries - as well as the potential and limits of its own national

power. By focusing on these three "wars of revelation," Lissner presents a fresh perspective on the origins and evolutions of US grand strategy, from the dawn of the Cold War to its twilight. Persuasively argued and historically illuminating, Wars of Revelation is essential reading for anyone who crafts, studies, or follows international security policy.

While the big bad corporation has often been the offender in many of the world's greatest environmental disasters, in the case of the mass poisoning at Camp Lejeune the culprit is a revered institution: the US Marine Corps. For two decades now, revelations have steadily emerged about pervasive contamination, associated clusters of illness and death among the Marine families stationed there, and military stonewalling and failure to act. Mike Magner's chilling investigation creates a suspenseful narrative from the individual stories, scientific evidence, and smoldering sense of betrayal among those whose motto is undying fidelity. He also raises far-reaching and ominous questions about widespread contamination on US military bases worldwide.

The author describes with unusual candor the behind the scenes activity, the give and take, and the decisions of high-ranking university officials responsible for exercising authority at the University of Hawaii, including regents, administrators, deans and directors, and faculty. The actions of non-university officials who influence Hawaii's higher education policy and funding are also described; federal officials, state officials, and powerful legislators.

Addressing the need for full and accurate functional information during the design process, this guide offers a comprehensive overview of functional verification from the points of view of leading experts at work in the electronic-design industry.

Though thousands of articles and books have been published on various aspects of the Manhattan Project, this book is the first comprehensive single-volume history prepared by a specialist for curious readers without a scientific background. This project, the United States Army's program to develop and deploy atomic weapons in World War II, was a pivotal event in human history. The author presents a wide-ranging survey that not only tells

the story of how the project was organized and carried out, but also introduces the leading personalities involved and features simplified but accurate descriptions of the underlying science and the engineering challenges. The technical points are illustrated by reader-friendly graphics.

Dragon V2 is a futuristic vehicle that not only provides a means for NASA to transport its astronauts to the orbiting outpost but also advances SpaceX's core objective of reusability. A direct descendant of Dragon, Dragon V2 can be retrieved, refurbished and re-launched. It is a spacecraft with the potential to completely revolutionize the economics of an industry where equipment costing hundreds of millions of dollars is routinely discarded after a single use. It was presented by SpaceX CEO Elon Musk in May 2014 as the spaceship that will carry NASA astronauts to the International Space Station as soon as 2016. SpaceX's Dragon - America's Next Generation Spacecraft describes the extraordinary feats of engineering and human achievement that have placed this revolutionary spacecraft at the forefront of the launch industry and positioned it as the precursor

son for ultimately transporting humans to Mars. It describes the design and development of Dragon, provides mission highlights of the first six Commercial Resupply Missions, and explains how Musk hopes to eventually colonize Mars.

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 Nation-

al 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.

Environmental research has driven landmark improvements that led to the protection of human and ecosystem health. Recognizing the value of knowledge generated by environmental research and the ingenuity within academic and nonprofit institutions, the US Environmental Protection Agency (EPA) created a program known as Science to Achieve Results, or STAR, in 1995. STAR is EPA's primary competitive extramural grants program. A Review of the Environmental Protection Agency's Science to Achieve Results Research Program assesses the program's scientific merit, public benefits, and overall contributions in the context of other relevant research and recommends ways to enhance those aspects of the program. This report also considers the conclusions and recommendations of a prior National Research Council review of the

STAR program (2003), the STAR program's research priorities in light of the nation's environmental challenges, and the effects of recent STAR funding trends on obtaining scientific information needed to protect public health and the environment.

The senior research compliance administrator has emerged as a critically important position as universities and other research organizations face an increasingly intricate regulatory environment. These administrators are tasked with a special challenge: ensuring that their institutions conduct safe, ethical, and compliant research while also helping researchers understand and meet compliance requirements and achieve their research goals. These competing responsibilities can make the role of the research administrator complex; however, those who serve in this role may find that they have limited preparation for the challenges and little or no formal education in the field. Thus, the goal of this handbook is to provide practical guidance to research administrators who are responsible for a wide variety of compliance programs. Previous volumes on these topics have focused primarily

on educating research faculty, staff, and students. An assumption in many of these handbooks is that all additional questions related to research ethics and regulations should be directed to the senior research administrator; yet, the books have limited guidance intended for the senior research administrators themselves. This handbook is designed, therefore, to serve as a detailed program implementation manual for these administrators, who are expected to be conversant on a broad range of complex ethical and regulatory topics and to provide guidance to those conducting research, as well as upper administration and others interested in safe, ethical, and compliant research.

Specifically designed as an introduction to the exciting world of engineering, **ENGINEERING FUNDAMENTALS: AN INTRODUCTION TO ENGINEERING** encourages students to become engineers and prepares them with a solid foundation in the fundamental principles and physical laws. The book begins with a discovery of what engineers do as well as an inside look into the various areas of specialization. An explanation on good study habits and

what it takes to succeed is included as well as an introduction to design and problem solving, communication, and ethics. Once this foundation is established, the book moves on to the basic physical concepts and laws that students will encounter regularly. The framework of this text teaches students that engineers apply physical and chemical laws and principles as well as mathematics to design, test, and supervise the production of millions of parts, products, and services that people use every day. By gaining problem solving skills and an understanding of fundamental principles, students are on their way to becoming analytical, detail-oriented, and creative engineers. Important Notice: Media content referenced within the product description or the product text may not be available in the ebook version.

From the ebook Preface: "This book majors on the presentation of empirical evidence in the form of data. The most digestible form for communicating such material is through the use of Tables and Figures, generally graphs. Consequently, the book has a great many Tables and Figures and the latter

are often in colour. Viewing on a device capable of rendering colours is therefore recommended although monochrome will be adequate in most cases." The Empathy Gap proposes the thesis that men and boys are extensively disadvantaged across many areas of life, including in education, health-care, genital integrity, criminal justice, domestic abuse, working hours, taxation, pensions, paternity, homelessness, suicide, sexual offences, and access to their own children after parental separation. The claim is justified in the book by empirical evidence, mostly but not exclusively from the UK, involving nearly 1,000 references, 179 Figures and 49 Tables. To most people, of both sexes, this will appear to be a perverse perspective as disadvantage has become the province of women, girls and minorities, not males. Yet the empirical case supporting the disadvantages suffered by men and boys is undeniable to the objective mind. But if this is so, why is the popular perception that males are privileged whereas disadvantage is the province of the opposite sex? Why do the male disadvantages go largely unremarked, by both sexes, if they are so

pervasive? Presenting the case for widespread and substantial male disadvantage is also a challenge to the usual hegemonic paradigm of feminist theory. These issues are addressed within The Empathy Gap by presenting an entirely different orientation on the social psychology of relations between the sexes. Out goes the idea of an oppressive patriarchy. Instead, a man's participation in the human pair bond is seen to be altruistic, a phenomenon arising originally from evolution and enacted in the individual via the emotional psyche. This is the origin of an asymmetry in the perception of the sexes which normalises the preferencing of females and therefore inevitably disadvantages males as a corollary. The successful evolved strategy involves male utility and relative male disposability, the latter being facilitated by a muted empathy for males, by both sexes - the empathy gap. Rather than working to overcome this male disposability, as a true egalitarian movement would have done, feminism has fed upon it and amplified it. The feminist project relies upon the true state of affairs remaining unacknowledged, and the empathy gap is in-

strumental in its own invisibility. In respect of this theory, the author makes no claim for originality. The ideas presented have been circulating within the sub-culture for decades. However, the focus of the book is to show how these ideas are manifest in practice.

The Office of the Under Secretary of Defense (Personnel & Readiness), referred to throughout this report as P&R, is responsible for the total force management of all Department of Defense (DoD) components including the recruitment, readiness, and retention of personnel. Its work and policies are supported by a number of organizations both within DoD, including the Defense Manpower Data Center (DMDC), and externally, including the federally funded research and development centers (FFRDCs) that work for DoD. P&R must be able to answer questions for the Secretary of Defense such as how to recruit people with an aptitude for and interest in various specialties and along particular career tracks and how to assess on an ongoing basis service members' career satisfaction and their ability to meet new challenges. P&R must also address larger-scale ques-

tions, such as how the current realignment of forces to the Asia-Pacific area and other regions will affect recruitment, readiness, and retention. While DoD makes use of large-scale data and mathematical analysis in intelligence, surveillance, reconnaissance, and elsewhere—exploiting techniques such as complex network analysis, machine learning, streaming social media analysis, and anomaly detection—these skills and capabilities have not been applied as well to the personnel and readiness enterprise. Strengthening Data Science Methods for Department of Defense Personnel and Readiness Missions offers and roadmap and implementation plan for the integration of data analysis in support of decisions within the purview of P&R.

In different areas of the world, much of the damage due to wind is caused by non-synoptic, local wind storm events, such as tornadoes and downbursts. In North America the damage due to these winds is more than 65% of total wind damage, and there are no guidelines or code implementations to deal with such catastrophic events. As we enter the third decade of the twen-

ty-first century, current research is in its first phase of addressing these types of events, from their characterization, simulation, and loading, to collapse-mode effects on buildings and structures, as well as socioeconomic implications. The need is clear to better understand non-synoptic local winds; properly simulate them; assess the difference in loading between these events and synoptic large-scale winds that have been part of the wind engineering practice for more than five decades; determine their statistics and associated risks; and apply this through guidelines, codes, risk mitigation, and adaptation responses to socioeconomic impact. The Oxford Handbook of Non-Synoptic Wind Storms, led by Dr. Horia Hangan and Dr. Ahsan Kareem, features nearly 30 chapters, contributed by an international panel of leading scientists, scholars, and engineers, that address these issues and stimulate thought, research, and responses to non-synoptic wind storm hazards in North America and worldwide. Together, these articles provide clear definitions of the problems to be tackled, offer a strategic framework for forward-looking research,

identify the best-suited tools and methodologies to address the problems at hand, and suggest ways to maximize collaborative planning between the disciplines that will tackle these challenges.

This volume focuses on frontiers in regional research and identifies trends and future developments in the areas of innovation, regional growth and migration. It also addresses topics such as mobility, regional forecasting, and regional policy, and includes expert contributions on disasters, resilience, and sustainability. Building on recent methodological and modelling advances, as well as on extensive policy-analysis experience, top international regional scientists identify and evaluate emerging new conceptual and methodological trends and directions in regional research. This book will appeal to a wide readership, from regional scientists and economists to geographers, quantitatively oriented regional planners and other related disciplines. It offers a source of relevant information for academic researchers and policy analysts in government, and is also suitable for advanced teaching courses on regional and spatial science, eco-

nomics and political science.

Openness and sharing of information are fundamental to the progress of science and to the effective functioning of the research enterprise. The advent of scientific journals in the 17th century helped power the Scientific Revolution by allowing researchers to communicate across time and space, using the technologies of that era to generate reliable knowledge more quickly and efficiently. Harnessing today's stunning, ongoing advances in information technologies, the global research enterprise and its stakeholders are moving toward a new open science ecosystem. Open science aims to ensure the free availability and usability of scholarly publications, the data that result from scholarly research, and the methodologies, including code or algorithms, that were used to generate those data. Open Science by Design is aimed at overcoming barriers and moving toward open science as the default approach across the research enterprise. This report explores specific examples of open science and discusses a range of challenges, focusing on stakeholder per-

spectives. It is meant to provide guidance to the research enterprise and its stakeholders as they build strategies for achieving open science and take the next steps.

Publicly available statistics from government agencies that are credible, relevant, accurate, and timely are essential for policy makers, individuals, households, businesses, academic institutions, and other organizations to make informed decisions. Even more, the effective operation of a democratic system of government depends on the unhindered flow of statistical information to its citizens. In the United States, federal statistical agencies in cabinet departments and independent agencies are the governmental units whose principal function is to compile, analyze, and disseminate information for such statistical purposes as describing population characteristics and trends, planning and monitoring programs, and conducting research and evaluation. The work of these agencies is coordinated by the U.S. Office of Management and Budget. Statistical agencies may acquire information not only from surveys or censuses of people and organizations, but also from such

sources as government administrative records, private-sector datasets, and Internet sources that are judged of suitable quality and relevance for statistical use. They may conduct analyses, but they do not advocate policies or take partisan positions. Statistical purposes for which they provide information relate to descriptions of groups and exclude any interest in or identification of an individual person, institution, or economic unit. Four principles are fundamental for a federal statistical agency: relevance to policy issues, credibility among data users, trust among data providers, and independence from political and other undue external influence. Principles and Practices for a Federal Statistical Agency: Sixth Edition presents and comments on these principles as they've been impacted by changes in laws, regulations, and other aspects of the environment of federal statistical agencies over the past 4 years.

The massive increase in digital information in the last decade has created new requirements for institutional and technological structures and workforce skills. Preparing the Workforce for Digital Curation focuses on education and

training needs to meet the demands for access to and meaningful use of digital information, now and in the future. This study identifies the various practices and spectrum of skill sets that comprise digital curation, looking in particular at human versus automated tasks. Additionally, the report examines the possible career path demands and options for professionals working in digital curation activities, and analyzes the economic benefits and societal importance of digital curation for competitiveness, innovation, and scientific advancement. Preparing the Workforce for Digital Curation considers the evolving roles and models of digital curation functions in research organizations, and their effects on employment opportunities and requirements. The recommendations of this report will help to advance digital curation and meet the demand for a trained workforce.

The first nuclear engineers emerged from the Manhattan Project in the USA, UK and Canada, but remained hidden behind security for a further decade. Cosseted and cloistered by their governments, they worked to explore applications of atomic energy at a handful of

national labs. This unique bottom-up history traces how the identities of these unusually voiceless experts - forming a uniquely state-managed discipline - were shaped in the context of pre-war nuclear physics, wartime industrial management, post-war politics and utopian energy programmes. Even after their eventual emergence at universities and companies, nuclear workers carried the enduring legacy of their origins. Their shared experiences shaped not only their identities, but our collective memories of the late twentieth century. And as illustrated by the Fukushima accident seven decades after the Manhattan project began, this book explains why they are still seen conflictingly as selfless heroes or as mistrusted guardians of a malevolent genie.

This book provides multifaceted components and full practical perspectives of systems engineering and risk management in security and defense operations with a focus on infrastructure and manpower control systems, missile design, space technology, satellites, intercontinental ballistic missiles, and space security. While there are many existing

selections of systems engineering and risk management textbooks, there is no existing work that connects systems engineering and risk management concepts to solidify its usability in the entire security and defense actions. With this book Dr. Anna M. Doro-on rectifies the current imbalance. She provides a comprehensive overview of systems engineering and risk management before moving to deeper practical engineering principles integrated with newly developed concepts and examples based on industry and government methodologies. The chapters also cover related points including design principles for defeating and deactivating improvised explosive devices and land mines and security measures against kinds of threats. The book is designed for systems engineers in practice, political risk professionals, managers, policy makers, engineers in other engineering fields, scientists, decision makers in industry and government and to serve as a reference work in systems engineering and risk management courses with focus on security and defense operations.

This interdisciplinary book examines the impact of

the commercialisation of space and the changing outlook of the space sector. Using a framework based around theories of international political economy (IPE), the chapters take on issues relating to the politics, the economics and the ethics of commercialising space. The book aims to build a bridge between the research carried out on European Space Policy and the issues that are currently pertinent in the global discussion of future space policy. Overall, the volume aims to:

- inform the reader about historical and contemporary developments in the neoliberal commercialisation of space;
- assess the impact of the commercialisation of space on European space institutions, European space policy and European space culture;
- raise ethical questions about the environmental and practical sustainability of the commercialisation of space;
- examine the compatibility of the commercialisation of space with international, EU and national law.

This book will be of much interest to students of space policy, global governance, European politics and International Relations. Understanding, quantify-

ing, and tracking atmospheric methane and emissions is essential for addressing concerns and informing decisions that affect the climate, economy, and human health and safety. Atmospheric methane is a potent greenhouse gas (GHG) that contributes to global warming. While carbon dioxide is by far the dominant cause of the rise in global average temperatures, methane also plays a significant role because it absorbs more energy per unit mass than carbon dioxide does, giving it a disproportionately large effect on global radiative forcing. In addition to contributing to climate change, methane also affects human health as a precursor to ozone pollution in the lower atmosphere. Improving Characterization of Anthropogenic Methane Emissions in the United States summarizes the current state of understanding of methane emissions sources and the measurement approaches and evaluates opportunities for methodological and inventory development improvements. This report will inform future research agendas of various U.S. agencies, including NOAA, the EPA, the DOE, NASA,

the U.S. Department of Agriculture (USDA), and the National Science Foundation (NSF).

Governments, their agencies, and businesses are perpetually battling to protect valuable, classified, proprietary, or sensitive information but often find that the restrictions imposed upon them by information security policies and procedures have significant, negative impacts on their ability to function. These government and business entities are

Have you ever wondered what it is like to work on a nuclear power plant? Robert Dutch worked in the UK's nuclear industry for many years as a scientist and then as a tutor at a nuclear training center. He also holds degrees in theology. Drawing upon his qualifications and experience Robert addresses the controversial issue of nuclear power from a Christian perspective. In contrast to a negative nuclear narrative often portrayed, he presents a positive nuclear narrative alongside other ways of generating electricity. Be prepared to be challenged to think seriously about nuclear's merits in providing clean, low-carbon electricity.