

Physical Sciences February March 2016 P1 Grade12 Siloo

In 2005, the National Research Council report *Rising Above the Gathering Storm* recommended a new way for the federal government to spur technological breakthroughs in the energy sector. It recommended the creation of a new agency, the Advanced Research Projects Agency-Energy, or ARPA-E, as an adaptation of the Defense Advanced Research Projects Agency (DARPA) model—widely considered a successful experiment that has funded out-of-the-box, transformative research and engineering that made possible the Internet, GPS, and stealth aircraft. This new agency was envisioned as a means of tackling the nation's energy challenges in a way that could translate basic research into technological breakthroughs while also addressing economic, environmental, and security issues. Congress authorized ARPA-E in the 2007 America COMPETES Act and requested an early assessment following 6 years of operation to examine the agency's progress toward achieving its statutory mission and goals. This report documents the results of that assessment. It includes both an operational assessment of the agency's funding programs and a technical assessment of its awards, to the extent possible.

Optimized interaction of the brain with environment requires the four-dimensional representation of space-time in the neuronal circuits. Information processing is an important part of this interaction, which is critically dependent on time-dimension. Information processing has played an important role in the evolution of mammals, and has reached a level of critical importance in the lives of primates, particularly the humans. The entanglement of time-dimension with information processing in the brain is not clearly understood at present. Time-dimension in physical world – the environment of an organism – can be represented by the interval of a pendulum swing (the cover page depicts temporal unit with the help of a swinging pendulum). Temporal units in neural processes are represented by regular activities of pacemaker neurons, tonic regular activities of proprioceptors and periodic fluctuations in the excitability of neurons underlying brain oscillations. Moreover, temporal units may be representationally associated with time-bins containing bits of information (see the Editorial), which may be studied to understand the entanglement of time-dimension with neural information processing. The optimized interaction of the brain with environment requires the calibration of neural temporal units. Neural temporal units are calibrated as a result of feedback processes occurring during the interaction of an organism with environment. Understanding the role of time-dimension in the brain information processing requires a multidisciplinary approach, which would include psychophysics, single cell studies and brain recordings. Although this Special Issue has helped us move forward on some fronts, including theoretical understanding of calibration of time-information in neural circuits, and the role of brain oscillations in timing functions and integration of asynchronous sensory information, further advancements are needed by developing correct computational tools to resolve the relationship between dynamic, hierarchical neural oscillatory structures that form during the brain's interaction with environment.

The U.S. Nuclear Regulatory Commission (NRC) has prepared this environmental impact statement (EIS) in response to an application submitted by Northwest Medical Isotopes, LLC (NWMI) for a construction permit for the NWMI medical radioisotope production facility. The EIS includes the analysis that evaluates the environmental impacts of the proposed action and considers the following alternatives to the proposed action: (1) the no-action alternative (i.e., the construction permit is denied), (2) one alternative site, and (3) two alternative technologies. After weighing the environmental, economic, technical, and other benefits against environmental and other costs, and considering reasonable alternatives, the NRC staff's recommendation, unless safety issues mandate otherwise, is to issue a construction permit to NWMI. The NRC staff based its recommendation on the following factors: the NRC staff's review of the NWMI Environmental Report and responses to requests for additional information; the NRC staff's consultation with Federal, State, and local agencies and Tribal officials; the NRC staff's independent environmental review; and the NRC staff's consideration of public comments. Related products: Other products published by the U.S. Nuclear Regulatory Commission can be found here: <https://bookstore.gpo.gov/agency/nuclear-regulatory-commission-nrc> Environment & Nature resources collection can be found here: <https://bookstore.gpo.gov/catalog/environment-nature>

Nutritional Cognitive Neuroscience is an emerging interdisciplinary field of research that seeks to understand nutrition's impact on human cognition and brain health across the life span. Research in this burgeoning field demonstrates that many aspects of nutrition – from entire diets to specific nutrients – affect brain structure and function, and therefore have profound implications for understanding the nature of psychological health, aging, and disease. The aim of this Research Topic in *Frontiers in Aging Neuroscience* is to examine recent empirical and theoretical contributions from Nutritional Cognitive Neuroscience, with an emphasis on the following primary areas of inquiry. Nutrition and Brain Health An enduring aim of research in the nutritional sciences is to discover specific nutrients and dietary patterns that enhance cognitive function and brain health in the elderly. Although an abundance of evidence supports a single or a few nutrients for the promotion of cognitive performance and brain health, clinical trials using nutritional supplementation have been predominately unsuccessful. Further research is therefore needed to better characterize the contributions of specific nutrients and nutrient combinations to cognitive performance and brain health. Moderators of Nutrition's Impact on the Brain A second major area of research in Nutritional Cognitive Neuroscience investigates the mechanisms that underlie the effects of nutrition on brain health at the cellular, molecular, and circuit levels. Accumulating evidence indicates that the effects of nutrition on brain health are complex and multifactorial, reflecting the influence of particular nutrient combinations on specific brain networks and taking into account several moderating factors. Considerably more research is needed to elucidate the complex interactions between nutrition and known moderating variables – including age, nutritional status, genes, environment, and lifestyle – in determining nutrition's impact on cognitive function and brain health. Personalized Nutrition Research at the frontiers of Nutritional Cognitive Neuroscience establishes a personalized approach to nutritional intervention that takes into account individual variability in nutritional status, brain health, genes, environment, and lifestyle. The goal of personalized nutrition is to enhance the precision of nutritional intervention and to enable novel applications to psychological health, aging, and disease.

Conventional health care is no longer working in your favor?but thankfully, Dr. Davis is. In his New York Times bestseller *Wheat Belly*, Dr. William Davis changed the lives of millions of people by teaching them to remove grains from their diets to reverse years of chronic health damage. In *Undoctored*, he goes beyond cutting grains to help you take charge of your own health. This groundbreaking exposé reveals how millions of people are given dietary recommendations crafted by big business, are prescribed unnecessary medications, and undergo unwarranted procedures to feed revenue-hungry healthcare systems. With *Undoctored*, the code to health care has been cracked?Dr. Davis will help you create a comprehensive program to reduce, reverse, and cure hundreds of common health conditions and break your dependence on prescription drugs. By applying simple strategies while harnessing the collective wisdom of new online technologies, you can break free of a healthcare industry that puts profits over health. *Undoctored* is the spark of a new movement in health that places the individual, not the doctor, at the center. His plan contains features like: • A step-by-step guide to eliminating prescription medications • Tips on how to distinguish good medical advice from bad • 42 recipes to guide you through the revolutionary 6-week program *Undoctored* gives you all the tools you need to manage your own health and sidestep the misguided motives of a profit-driven medical system.

This book surveys state-of-the-art research on and developments in lithium-ion batteries for hybrid and electric vehicles. It summarizes their features in terms of performance, cost, service life, management, charging facilities, and safety. Vehicle electrification is now commonly accepted as a means of reducing fossil-fuels consumption and air pollution. At present, every electric vehicle on the road is powered by a lithium-ion battery. Currently, batteries based on lithium-ion technology are ranked first in terms of performance, reliability and safety. Though other systems, e.g., metal-air, lithium-sulphur, solid state, and aluminium-ion, are now being investigated, the lithium-ion system is likely to dominate for at least the next decade – which is why several manufacturers, e.g., Toyota, Nissan and Tesla, are chiefly focusing on this

disproportionate impacts that climate change processes have on women in these regions. Though many books attempt to incorporate gender issues into climate change, this book examines the issue as a whole by addressing the relationship between climate change and gender from a number of perspectives. The book incorporates case studies from various regions of the Global South, a designation broadly defined as the countries of Africa, Middle and South America, and most of Asia including the Middle East. In the book's two main sections, readers will learn about how climate change affects access to regional opportunities and resources, the obstacles created by climate change that affect women more strongly than men, and how affected female populations adapt to changing conditions and protect their local livelihoods. Section one, covering chapters 1 and 2, addresses the spatial patterns of climate change and gender inequalities/inequities across the Global South by analyzing long-term trends from the latest reports of the Intergovernmental Panel on Climate Change (IPCC) and the World Economic forum. Section two, covering chapters 3 through 7, discusses the critical issues related to climate change and gender inequality, and presents literature reviews and case studies in the Global South. The different issues and perspectives discussed include health, water and food security, education, conflicts, migration, participation in decision-making processes, and changing urban social landscapes. The concluding chapter discusses policy initiatives and makes recommendations to some of the gender mainstreaming through empowerment and participation. This interdisciplinary book will appeal to academics and policy-makers beyond just the fields of environmental sciences and gender studies, and may be adopted as a resource for graduate students and researchers.

This completely updated second edition of an Artech House classic covers industrial applications and space and biomedical applications of magnetic sensors and magnetometers. With the advancement of smart grids, renewable energy resources, and electric vehicles, the importance of electric current sensors increased, and the book has been updated to reflect these changes. Integrated fluxgate single-chip magnetometers are presented. GMR sensors in the automotive market, especially for end-of-shaft angular sensors, are included, as well as Linear TMR sensors. Vertical Hall sensors and sensors with integrated ferromagnetic concentrators are two competing technologies, which both brought 3-axial single-chip Hall ICs, are considered. Digital fluxgate magnetometers for both satellite and ground-based applications are discussed. All-optical resonant magnetometers, based on the Coherent Population Trapping effect, has reached approval in space, and is covered in this new edition of the book. Whether you're an expert or new to the field, this unique resource offers you a thorough overview of the principles and design of magnetic sensors and magnetometers, as well as guidance in applying specific devices in the real world. The book covers both multi-channel and gradiometric magnetometer systems, special problems such as cross-talk and crossfield sensitivity, and comparisons between different sensors and magnetometers with respect to various application areas. Miniaturization and the use of new materials in magnetic sensors are also discussed. A comprehensive list of references to journal articles, books, proceedings and webpages helps you find additional information quickly.

A Scientific Aspect of Transgenders depicts the life, problems, livelihood, social position, language, customs and other information about the transgender community and people belonging to other parallel sexual communities in picturesque language. The book is an analytical and fundamental study. It deals with the life of transgender people as well as lesbian, gay, bisexual, queer and inter-sex persons. The authors have put special emphasis on the Fourth Gender by discussing LGBTQI in a separate unit. There is a belief that all the transgender people are sexually congenital. But the truth is that they are not born but made. Their code language, marriage, sexual life, rituals, their movement in this country and abroad and the cause of their suicidal trend have been explained in this book.

This two volume set LNBI 10208 and LNBI 10209 constitutes the proceedings of the 5th International Work-Conference on Bioinformatics and Biomedical Engineering, IWBBIO 2017, held in Granada, Spain, in April 2017. The 122 papers presented were carefully reviewed and selected from 309 submissions. The scope of the conference spans the following areas: advances in computational intelligence for critical care; bioinformatics for healthcare and diseases; biomedical engineering; biomedical image analysis; biomedical signal analysis; biomedicine; challenges representing large-scale biological data; computational genomics; computational proteomics; computational systems for modeling biological processes; data driven biology - new tools, techniques and resources; eHealth; high-throughput bioinformatic tools for genomics; oncological big data and new mathematical tools; smart sensor and sensor-network architectures; time lapse experiments and multivariate biostatistics.

This book examines how an error in global meta-policy set climate change negotiations on an unproductive course. The decision to base negotiations on the Montreal Protocol and overlook the importance of interests, it argues, institutionalised an approach doomed to fail. By analysing interests, science and norms in the process, and the neglect of 'interactive unilateralism', learning was delayed until the more promising Paris Agreement was finally concluded, only to encounter a Trump Presidency, which (ironically) might offer further learning opportunities.

Magnetism defines the complex and dynamic solar corona. It determines the magnetic loop structure that dominates images of the corona, and stores the energy necessary to drive coronal eruptive phenomena and flare explosions. At great heights the corona transitions into the ever-outflowing solar wind, whose speed and three-dimensional morphology are controlled by the global coronal magnetic field. Coronal magnetism is thus at the heart of any understanding of the nature of the corona, and essential for predictive capability of how the Sun affects the Earth. Coronal magnetometry is a subject that requires a concerted effort to draw together the different strands of research happening around the world. Each method provides some information about the field, but none of them can be used to determine the full 3D field structure in the full volume of the corona. Thus, we need to combine them to understand the full picture. The purpose of this Frontiers Research Topic on Coronal Magnetometry is to provide a forum for comparing and coordinating these research methods, and for discussing future opportunities.

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 preexisting 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.

First published in 1922 and based on lectures delivered in May 1921, Albert Einstein's *The Meaning of Relativity* offered an overview and explanation of the then new and controversial theory of relativity. The work would go on to become a monumental classic, printed in numerous editions and translations worldwide. Now, *The Formative Years of Relativity* introduces Einstein's masterpiece to new audiences. This beautiful volume contains Einstein's insightful text, accompanied by important historical

materials and commentary looking at the origins and development of general relativity. Hanoch Gutfreund and Jürgen Renn provide fresh, original perspectives, placing Einstein's achievements into a broader context for all readers. In this book, Gutfreund and Renn tell the rich story behind the early reception, spread, and consequences of Einstein's ideas during the formative years of general relativity in the late 1910s and 1920s. They show that relativity's meaning changed radically throughout the nascent years of its development, and they describe in detail the transformation of Einstein's work from the esoteric pursuit of one individual communicating with a handful of colleagues into the preoccupation of a growing community of physicists, astronomers, mathematicians, and philosophers. This handsome edition quotes extensively from Einstein's correspondence and reproduces historical documents such as newspaper articles and letters. Inserts are featured in the main text giving concise explanations of basic concepts, and short biographical notes and photographs of some of Einstein's contemporaries are included. The first-ever English translations of two of Einstein's popular Princeton lectures are featured at the book's end.

The 14th International Symposium on Superalloys (Superalloys 2020) highlights technologies for lifecycle improvement of superalloys. In addition to the traditional focus areas of alloy development, processing, mechanical behavior, coatings, and environmental effects, this volume includes contributions from academia, supply chain, and product-user members of the superalloy community that highlight technologies that contribute to improving manufacturability, affordability, life prediction, and performance of superalloys.

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. High-performance electronics are key to the U.S. Air Force's (USAF's) ability to deliver lethal effects at the time and location of their choosing. Additionally, these electronic systems must be able to withstand not only the rigors of the battlefield but be able to perform the needed mission while under cyber and electronic warfare (EW) attack. This requires a high degree of assurance that they are both physically reliable and resistant to adversary actions throughout their life cycle from design to sustainment. In 2016, the National Academies of Sciences, Engineering, and Medicine convened a workshop titled Optimizing the Air Force's Acquisition Strategy of Secure and Reliable Electronic Components, and released a summary of the workshop. This publication serves as a follow-on to provide recommendations to the USAF acquisition community.

The differences between alcohol, food, gambling, and tobacco as consumer products are obvious. Yet research suggests that there are underlying similarities in the way that food, alcohol, and gambling industries are replicating the tobacco industry's strategy of attempting to influence and determine public health policy. Impact of Market Forces on Addictive Substances and Behaviours examines the 'web of influence' formed by industries which manufacture and sell addictive products and trade associations and policy intermediaries such as lobbyists and think tanks in the EU. Using a new dataset on these corporate networks, it quantifies the strength of the connections between the actors in these webs, and uses this data to guide qualitative studies on the content of corporate strategy and, specifically, on corporations' attempts to 'capture' policy and three crucial ancillary domains: science, civil society, and the news and promotional media. The study draws on the structural data to outline the comprehensive engagement of industry with policy issues at the EU and the ways in which corporations and stakeholders attempt to influence policy in their favour. It concludes by asking what kinds of solutions might be possible to the evident public health challenges posed by the addictions web of influence, and proposes key reforms that have the best chance of minimising the impact of disease stemming from addictions in European countries. Impact of Market Forces on Addictive Substances and Behaviours is based on the research from ALICE RAP, a multidisciplinary European study of addictive substances and behaviours in contemporary society. This is an essential resource for public health researchers, policy makers in the addictive substance and behaviours field, and academics specialising in the fields of governance of addictive substances and behaviours and public health, as well as GPs and social workers wishing to supplement their knowledge on current addiction issues.

Climate is an enduring idea of the human mind and also a powerful one. Today, the idea of climate is most commonly associated with the discourse of climate-change and its scientific, political, economic, social, religious and ethical dimensions. However, to understand adequately the cultural politics of climate-change it is important to establish the different origins of the idea of climate itself and the range of historical, political and cultural work that the idea of climate accomplishes. In Weathered: Cultures of Climate, distinguished professor Mike Hulme opens up the many ways in which the idea of climate is given shape and meaning in different human cultures – how climates are historicized, known, changed, lived with, blamed, feared, represented, predicted, governed and, at least putatively, re-designed.

This book is an attempt to address two struggles for "theistic educators" (e.g., those who approach their educational vocation from a religious perspective), whether they are working in secular or faith-based institutions. The first struggle is that, while numerous guidelines on teaching excellence have been compiled, the resulting checklists can contain more than a hundred criteria to consider. This book therefore identifies the evidence-based guidelines that are likely to have the highest impact on student achievement, thereby empowering educators to focus their efforts in more substantial ways. The second struggle is related to the lack of resources, which can help educators to view and approach their vocation from a theistic perspective. While there are texts that discuss the relationship of spirituality and/or theology to education, few to date have sought to bring evidence-based educational literature into dialogue with the western Christian tradition and thereby develop a "bottom-up" theology of education. This book addresses this historical and theological gap. Overall, this book is therefore intended to not only provide theistic educators with high-impact guidelines that can significantly improve the quality of education in their school systems, but it also strives to do so from a thoroughly theistic perspective.

Just a sample of the contents ... contains over 2,800 total pages PROSPECTS FOR THE RULE OF LAW IN CYBERSPACE Cyberwarfare and Operational Art CYBER WARFARE GOVERNANCE: EVALUATION OF CURRENT INTERNATIONAL AGREEMENTS ON THE OFFENSIVE USE OF CYBER Cyber Attacks and the Legal Justification for an Armed Response UNTYING OUR HANDS:

RECONSIDERING CYBER AS A SEPARATE INSTRUMENT OF NATIONAL POWER Effects-Based Operations in the Cyber Domain Recommendations for Model-Driven Paradigms for Integrated Approaches to Cyber Defense MILLENNIAL WARFARE IGNORING A REVOLUTION IN MILITARY AFFAIRS: THE NEED TO CREATE A SEPARATE BRANCH OF THE ARMED FORCES FOR CYBER WARFARE SPECIAL OPERATIONS AND CYBER WARFARE LESSONS FROM THE FRONT: A CASE STUDY OF RUSSIAN CYBER WARFARE ADAPTING UNCONVENTIONAL WARFARE DOCTRINE TO CYBERSPACE OPERATIONS: AN EXAMINATION OF HACKTIVIST BASED INSURGENCIES Addressing Human Factors Gaps in Cyber Defense Airpower History and the Cyber Force of the Future How Organization for the Cyber Domain Outpaced Strategic Thinking and Forgot the Lessons of the Past THE COMMAND OF THE TREND: SOCIAL MEDIA AS A WEAPON IN THE INFORMATION AGE SPYING FOR THE RIGHT REASONS: CONTESTED NORMS IN CYBERSPACE AIR FORCE CYBERWORX REPORT: REMODELING AIR FORCE CYBER COMMAND & CONTROL THE CYBER WAR: MAINTAINING AND CONTROLLING THE "KEY CYBER TERRAIN" OF THE CYBERSPACE DOMAIN WHEN NORMS FAIL: NORTH KOREA AND CYBER AS AN ELEMENT OF STATECRAFT AN ANTIFRAGILE APPROACH TO PREPARING FOR CYBER CONFLICT AIR

FORCE CYBER MISSION ASSURANCE SOURCES OF MISSION UNCERTAINTY Concurrency Attacks and Defenses Cyber Workforce Retention Airpower Lessons for an Air Force Cyber-Power Targeting –Theory IS BRINGING BACK WARRANT OFFICERS THE ANSWER? A LOOK AT HOW THEY COULD WORK IN THE AIR FORCE CYBER OPERATIONS CAREER FIELD NEW TOOLS FOR A NEW TERRAIN AIR FORCE SUPPORT TO SPECIAL OPERATIONS IN THE CYBER ENVIRONMENT Learning to Mow Grass: IDF Adaptations to Hybrid Threats CHINA'S WAR BY OTHER MEANS: UNVEILING CHINA'S QUEST FOR INFORMATION DOMINANCE THE ISLAMIC STATE'S TACTICS IN SYRIA: ROLE OF SOCIAL MEDIA IN SHIFTING A PEACEFUL ARAB SPRING INTO TERRORISM NON-LETHAL WEAPONS: THE KEY TO A MORE AGGRESSIVE STRATEGY TO COMBAT TERRORISM THOUGHTS INVADE US: LEXICAL COGNITION AND CYBERSPACE The Cyber Threat to Military Just-In-Time Logistics: Risk Mitigation and the Return to Forward Basing PROSPECTS FOR THE RULE OF LAW IN CYBERSPACE Cyberwarfare and Operational Art CYBER WARFARE GOVERNANCE: EVALUATION OF CURRENT INTERNATIONAL AGREEMENTS ON THE OFFENSIVE USE OF CYBER Cyber Attacks and the Legal Justification for an Armed Response UNTYING OUR HANDS: RECONSIDERING CYBER AS A SEPARATE INSTRUMENT OF NATIONAL POWER Effects-Based Operations in the Cyber Domain Recommendations for Model-Driven Paradigms for Integrated Approaches to Cyber Defense MILLENNIAL WARFARE IGNORING A REVOLUTION IN MILITARY AFFAIRS: THE NEED TO CREATE A SEPARATE BRANCH OF THE ARMED FORCES FOR CYBER WARFARE SPECIAL OPERATIONS AND CYBER WARFARE LESSONS FROM THE FRONT: A CASE STUDY OF RUSSIAN CYBER WARFARE ADAPTING UNCONVENTIONAL WARFARE DOCTRINE TO CYBERSPACE OPERATIONS: AN EXAMINATION OF HACKTIVIST BASED INSURGENCIES Addressing Human Factors Gaps in Cyber Defense Airpower History and the Cyber Force of the Future How Organization for the Cyber Domain Outpaced Strategic Thinking and Forgot the Lessons of the Past THE COMMAND OF THE TREND: SOCIAL MEDIA AS A WEAPON IN THE INFORMATION AGE SPYING FOR THE RIGHT REASONS: CONTESTED NORMS IN CYBERSPACE AIR FORCE CYBERWORX REPORT: REMODELING AIR FORCE CYBER COMMAND & CONTROL THE CYBER WAR: MAINTAINING AND CONTROLLING THE “KEY CYBER TERRAIN” OF THE CYBERSPACE DOMAIN WHEN NORMS FAIL: NORTH KOREA AND CYBER AS AN ELEMENT OF STATECRAFT AN ANTIFRAGILE APPROACH TO PREPARING FOR CYBER CONFLICT AIR FORCE CYBER MISSION ASSURANCE SOURCES OF MISSION UNCERTAINTY Concurrency Attacks and Defenses Cyber Workforce Retention

Twenty-one years ago, the term 'electronic publishing' promised all manner of potential that the Web and network technologies could bring to scholarly communication, scientific research and technical innovation. Over the last two decades, tremendous developments have indeed taken place across all of these domains. One of the most important of these has been Open Science; perhaps the most widely discussed topic in research communications today. This book presents the proceedings of Elpub 2017, the 21st edition of the International Conference on Electronic Publishing, held in Limassol, Cyprus, in June 2017. Continuing the tradition of bringing together academics, publishers, lecturers, librarians, developers, entrepreneurs, users and all other stakeholders interested in the issues surrounding electronic publishing, this edition of the conference focuses on Open Science, and the 27 research and practitioner papers and 1 poster included here reflect the results and ideas of researchers and practitioners with diverse backgrounds from all around the world with regard to this important subject. Intended to generate discussion and debate on the potential and limitations of openness, the book addresses the current challenges and opportunities in the ecosystem of Open Science, and explores how to move forward in developing an inclusive system that will work for a much broader range of participants. It will be of interest to all those concerned with electronic publishing, and Open Science in particular. Running can encompass the absolute extremes of human performance, from speed to endurance. Running Science uncovers the fundamental science that underpins this ubiquitous sport, bringing together the study of biomechanics, nutrition, psychology, health and injury prevention, and the technical development of shoes and running surfaces: it's a complete reference.

People are used to seeing “fake physics” in science fiction – concepts like faster-than-light travel, antigravity and time travel to name a few. The fiction label ought to be a giveaway, but some SF writers – especially those with a background in professional science – are so adept at “technobabble” that it can be difficult to work out what is fake and what is real. To confuse matters further, Isaac Asimov's 1948 piece about the fictitious time-travelling substance thiotimoline was written, not as a short story, but in the form of a spoof research paper. The boundaries between fact and fiction can also be blurred by physicists themselves - sometimes unintentionally, sometimes with tongue-in-cheek, sometimes to satirize perceived weaknesses in research practices. Examples range from hoaxes aimed at exposing poor editorial standards in academic publications, through “thought experiments” that sound like the plot of a sci-fi movie to April Fools' jokes. Even the latter may carry a serious message, whether about the sociology of science or poking fun at legitimate but far-out scientific hypotheses. This entertaining book is a joyous romp exploring the whole spectrum of fake physics – from science to fiction and back again.

Ten years after the publication of the first edition of this influential book, the evidence is even stronger that human economies are overwhelming the regenerative capacity of the planet. This book explains why long-term economic growth is infeasible, and why, especially in advanced economies, it is also undesirable. Simulations based on real data show that managing without growth is a better alternative

This book is the fourth volume of the sub series of the Lecture Notes in Mobility dedicated to Road Vehicle Automation. Its chapters have been written by researchers, engineers and analysts from all around the globe. Topics covered include public sector activities, human factors and challenges, ethical, legal, energy and technology perspectives, vehicle systems development, as well as transportation infrastructure and planning. The book is based on the Automated Vehicles Symposium which took place in San Francisco, California (USA) in July 2016.

The British have always been obsessed by the weather. Thomas Hornsby, who founded the Radcliffe Observatory in Oxford in 1772, began weather observations at the site. They continue daily to this day, unbroken since 14 November 1813, the longest continuous series of single-site weather records in the British Isles, and one of the longest in the world. Oxford Weather and Climate since 1767 represents the first full publication of this newly-digitised record of English weather, which will appeal to interested readers and climate researchers alike. The book celebrates this unique and priceless Georgian legacy by describing and explaining how the records were (and still are) made, examines monthly and seasonal weather patterns across two centuries, and considers the context of long-term climate change. Local documentary sources and contemporary photographs bring the statistics to life, from the clouds of 'snoak' from the Great Fire of London in 1666 to the most recent floods. This book explores all the weather extremes, from bitter cold winters to hot, dry summers, bringing to life the painstaking measurements made over the last 250 years.

Why Antibiotic Resistance? The use of antibiotics in human and veterinary medicine may have consequences beyond their intended applications. The “One Health” concept recognizes that the health of humans is connected to the health of animals and the environment. Progress in molecular genetics is facilitating the rapid evaluation of the essentiality of these targets on a genomic scale. In 2015, a group of researchers established the International Conference on Antibiotic Resistance (IC2AR). The primary objective of this meeting is to bring together scientists involved in antibiotic resistance prevention and control. The IC2AR conducted its inaugural world congress in January 2015 at Caparica (Portugal). Antimicrobial resistance presents a significant

challenge to scientists in the field of infectious diseases. The full knowledge of how antibiotics resistance is evolving and being transmitted between hosts in different ecosystems is taking on great importance. Necessary action includes research to define the scope of the problem including its various sources. This eBook comprises a series of original research and review articles dealing with the epidemiology of resistance in animal and zoonotic pathogens, mobile elements containing resistance genes, the omics of antimicrobial resistance, emerging antimicrobial resistance mechanisms, control of resistant infections, establishing antimicrobial use and resistance surveillance systems, and alternatives strategies to overcome the problem of antimicrobial resistance worldwide. Gilberto Igrejas, José Luis Capelo and Patrícia Poeta Scientific Committee of IC2AR, February 20th, 2017

Commercially significant amounts of crude oil and natural gas lie under the continental shelf of the United States. Advances in locating deposits, and improvements in drilling and recovery technology, have made it technically and economically feasible to extract these resources under harsh conditions. But extracting these offshore petroleum resources involves the possibility, however remote, of oil spills, with resulting damage to the ocean and the coastline ecosystems and risks to life and limb of those performing the extraction. The environmental consequences of an oil spill can be more severe underwater than on land because sea currents can quickly disperse the oil over a large area and, thus, cleanup can be problematic. Bolted connections are an integral feature of deep-water well operations. High-Performance Bolting Technology for Offshore Oil and Natural Gas Operations summarizes strategies for improving the reliability of fasteners used in offshore oil exploration equipment, as well as best practices from other industrial sectors. It focuses on critical bolting—bolts, studs, nuts, and fasteners used on critical connections.

Good quality management of the health system demands a critical mass of health professionals with sound technical knowledge. The education that produces a workforce of appropriate size and skills is often a challenge in the delivery of quality health services. Incidentally, health professionals' education has not kept pace with the new emerging challenges. Recent globalization of health has further led to international migration of health professionals, thereby leading to cross-border recognition of health workers with an appropriate skill-mix, knowledge, and competence. The Lancet Commission Report of 2010 highlighted the need to develop a common strategy at a global level for postgraduate medical, nursing, and public health education that reaches beyond the confines of national borders and the silos of individual professions. This vision would require a series of instructional and institutional reforms, which should be guided by two proposed outcomes: transformative learning and interdependence in education. The purpose of this Research Topic is to increase the shared understanding of the current status of the education of the health workforce around the globe, particularly those working in the public health sector. With this foundation, further research and evaluation studies can then be done with a perspective that addresses global workforce issues impacting access, prevention, and care.

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