

## Physical Science March 2014 Paper 1 Grade 11 Free State

The U.S. population is aging. Social Security projections suggest that between 2013 and 2050, the population aged 65 and over will almost double, from 45 million to 86 million. One key driver of population aging is ongoing increases in life expectancy. Average U.S. life expectancy was 67 years for males and 73 years for females five decades ago; the averages are now 76 and 81, respectively. It has long been the case that better-educated, higher-income people enjoy longer life expectancies than less-educated, lower-income people. The causes include early life conditions, behavioral factors (such as nutrition, exercise, and smoking behaviors), stress, and access to health care services, all of which can vary across education and income. Our major entitlement programs - Medicare, Medicaid, Social Security, and Supplemental Security Income - have come to deliver disproportionately larger lifetime benefits to higher-income people because, on average, they are increasingly collecting those benefits over more years than others. This report studies the impact the growing gap in life expectancy has on the present value of lifetime benefits that people with higher or lower earnings will receive from major entitlement programs. The analysis presented in *The Growing Gap in Life Expectancy by Income* goes beyond an examination of the existing literature by providing the first comprehensive estimates of how lifetime benefits are affected by the changing distribution of life expectancy. The report also explores, from a lifetime benefit perspective, how the growing gap in longevity affects traditional policy analyses of reforms to the nation's leading entitlement programs. This in-depth analysis of the economic impacts of the longevity gap will inform debate and assist decision makers, economists, and researchers.

There is an extensive literature conducted from a range of theoretical perspectives and methodologies on the role of groups and student learning in higher education. However here the concept of the 'group' is heavily contested at a theoretical level but within higher education practice, characterizing the group has tended to be clear cut. Groups of students are often formed within the parameters of specific educational programs to address explicitly defined learning objectives. These groups are often small scale and achieve tasks through cooperative or collaborative learning. Cooperative learning involves students dividing roles and responsibilities between group members, so learning becomes an independent process and outcome. On the other hand, collaborative learning involves students working together by developing shared meanings and knowledge to solve a task or problem. From this perspective, learning is conceptualized as both a social process and individual outcome. That is, collaborative learning may facilitate individual student conceptual understanding and hence lead to higher academic achievement. The empirical evidence is encouraging as has been shown that students working collaboratively tend to achieve higher grades than students working independently. However the above perspectives on student engagement assume that groups are formed within the confines of formal learning environments (e.g. lecture theaters), involve students on the same degree program, have the explicit function of achieving a learning task and disband once this has been achieved. However, students may also use existing social networks such as friendship groups as a mechanism for learning, which may occur outside of formal learning environments. There is an extensive literature on the role and benefits of friendship groups on student learning within primary and secondary education but there is a distinct lack of research within higher education. This ebook is innovative and ambitious and will highlight and consolidate, the current understanding of the role that student based engagement behaviors may serve in effective pedagogy. A unique aspect of this research topic will be the fact that scholars will also be welcome to submit articles that describe the efficacy of the full range of approaches that have been employed to facilitate student engagement across the sector.

This text traces the evolution of sustainable development and climate change from the time it emerged in international consultations and agreements. The three sections of the book, focusing on the framework, climate change and sustainable development, seek to cover the essentials of the politics of natural resource usage at the global level. The book explores the evolution of sustainable development and climate change within the framework of the United Nations, and the way the concept has been defined through intergovernmental meetings, agreements and consensus within the multilateral system. It also explores the best ways of reducing the risk to the planet while enabling societies to pursue sustainable development paths. The challenges call for a transformation of social systems to facilitate a broadly acceptable change. The book also explores the adoption of low-carbon models different from the high-carbon socio-technical systems and related social practices.

*Sustainable Futures in the Built Environment* provides an insight on both construction and development issues and examine how we can transition to a sustainable future by 2050 bringing together leading research and practice at building, neighbourhood and city levels. Coverage includes the 'hard end' of the built environment (across the scales of buildings, communities and cities), and the 'softer' end in terms of how professional practice will need to adapt to these trends. Invaluable source for researchers and postgraduate students as well as built environment professionals.

Understanding how to sustain the services that ecosystems provide in support of human wellbeing is an active and growing research area. This book provides a state-of-the-art review of current thinking on the links between ecosystem services and poverty alleviation. In part it showcases the key findings of the Ecosystem Services for Poverty Alleviation (ESPA) programme, which has funded over 120 research projects in more than 50 countries since 2010. ESPA's goal is to ensure that ecosystems are being sustainably managed in a way that contributes to poverty alleviation as well as to inclusive and sustainable growth. As governments across the world map how they will achieve the 17 ambitious Sustainable Development Goals, most of which have poverty alleviation, wellbeing and sustainable environmental management at their heart, ESPA's findings have never been more timely and relevant. The book synthesises the headline messages and compelling evidence to address the questions at the heart of ecosystems and wellbeing research. The authors, all leading specialists, address the evolving framings and contexts for the work, review the

impacts of ongoing drivers of change, present new ways to achieve sustainable wellbeing, equity, diversity, and resilience, and evaluate the potential contributions from conservation projects, payment schemes, and novel governance approaches across scales from local to national and international. The cross-cutting, thematic chapters challenge conventional wisdom in some areas, and validate new methods and approaches for sustainable development in others. The book will provide a rich and important reference source for advanced students, researchers and policy-makers in ecology, environmental studies, ecological economics and sustainable development. The Open Access version of this book, available at <https://www.taylorfrancis.com/books/e/9780429016295>, has been made available under a Creative Commons Attribution-Non Commercial-No Derivatives 4.0 license.

This book examines how the armed forces of the United States and Australia have responded to the threat posed by climate change to national security. Drawing on established securitisation frameworks ('Copenhagen' and 'Paris' Schools), the author uses a combination of quantitative and qualitative techniques to systematically examine more than 3,500 speeches, policies and doctrinal articles since 2003. Importantly, the author undertakes an examination of the intersection between the political and the military spheres, probing the question of how ideology has influenced the military's uptake on the issue. In this context, the author identifies the difficulty of an ostensibly apolitical institution responding to what has become both a hyper-political issue and an unprecedented security threat. A close examination of the key political actors – their intent, outlook and political mandate for broader climate action – is therefore crucial to understanding the policy freedom and constraints within which military leaders operate. The book consists of eight chapters divided into four parts, focusing on: perspectives and methodological insights; empirical case studies; case study comparison; and concluding observations. • Offers a rare and systematic examination of military climate policy by a military officer from Australia • Identifies a divergence of Australian military climate policy from that of the US military during the Obama Administration • Develops a unique method that quantifies climate security, enabling a graphical representation for quick and ready reference ideally suited to policy-makers

This book describes the four Nuclear Security Summits held over 2010-2016 at the initiative of U.S. President Barack Obama. The author draws upon his unique vantage point as a participant in the Summits, exclusive interviews with practitioners, and access to primary documents, to write an engaging history of the NSS and of nuclear security in general. The story of the NSS is also in part the story of multilateral nuclear forums, which have sprung up regularly since the dawn of the nuclear age to address perceived nuclear dangers. The success of these Summits in addressing the threat of nuclear terrorism holds important lessons for the design and work of nuclear forums today and into the future. The author presents a new approach to assessing 'international learning' that has important implications for the design of multilateral forums and updates the Cold War areas of nuclear knowledge being 'learnt' in the light of the NSS experience and other recent developments. This work will be of interest to scholars and practitioners in security studies, nuclear history, and International Relations.

New astronomical facilities, such as the under-construction Large Synoptic Survey Telescope and planned 30-meter-class telescopes, and new instrumentation on existing optical and infrared (OIR) telescopes, hold the promise of groundbreaking research and discovery. How can we extract the best science from these and other astronomical facilities in an era of potentially flat federal budgets for both the facilities and the research grants? Optimizing the U.S. Ground-Based Optical and Infrared Astronomy System provides guidance for these new programs that align with the scientific priorities and the conclusions and recommendations of two National Research Council (NRC) decadal surveys, *New Worlds, New Horizons for Astronomy and Astrophysics* and *Vision and Voyages for Planetary Sciences in the Decade 2013-2022*, as well as other NRC reports. This report describes a vision for a U.S. OIR System that includes a telescope time exchange designed to enhance science return by broadening access to capabilities for a diverse community, an ongoing planning process to identify and construct next generation capabilities to realize decadal science priorities, and near-term critical coordination, planning, and instrumentation needed to usher in the era of LSST and giant telescopes. International Science Congress Association organized 3rd International Science Congress (ISC-2013), with "Innovation with Global Responsibility" as its Focal Theme. ISC-2013 is divided in 20 sections. A total number of 900 Research Papers and 1000 registrations from 36 countries all over the world have been received. They are mainly from India, Iran, Sudan, Iraq, South Africa, Phillipines, Pakistan, Nighana, Erode, Czech Republic, Bangladesh, Swaziland, Jordan, USA, Thailand, Japan, Malaysia, Kazakhstan, UK, Colombia, Nepal, Italy, Bulgariya, Cameroun, France, Greece, Kazakhstan, Korea, Lithuania, Nigeria, Poland, Romania, Slovakiya, Ukraine, Venezuela and Turkey.

Drawing on first hand interview data with experts and government officials, Olivia Gippner develops a new analytical framework to explore the vested interests and policy debates surrounding Chinese climate policy-making.

The G20 needs to be bold and pragmatic if it is to deal effectively with the global economy's big issues. Since its establishment in 1999, the G20 has become a key international forum. But it suffers from inherent design flaws and remains a work in progress. When Australia began its presidency of the 2014 summit in Brisbane, many commentators suggested that Australia's chairing of the G20 would reinvigorate it. This timely book looks at what was achieved at the Brisbane Summit and what has happened in its wake. Crucially, it explores what role the G20 could and should play in dealing with such pressing global issues as international taxation, trade, energy and climate change. Expert contributors, many of them former inside players, assess the impact of the summit in the context of the year's broader geopolitical challenges, including Russia's temporary expulsion from the G8 and the failure of the US to ratify its governance reforms to the IMF. Taking stock, contributors question the effectiveness of the G20, and identify the reforms that are needed if it is to offer strong leadership in an integrated global economy. Together they ask, what is the future of the G20 and other 'Gs'?

The authors examine how far internal policies in the European Union move towards the objective of reducing greenhouse

gas emissions in the EU by 80-95 per cent by 2050, and how or whether the EU's 2050 objective to 'decarbonise' could affect the EU's relations with a number of external energy partners.

This book constitutes the thoroughly refereed proceedings of the 11th International Conference on Collaborative Computing: Networking, Applications, and Worksharing, CollaborateCom 2015, held in Wuhan, China, in November 2015. The 24 full papers and 8 short papers presented were carefully reviewed and selected from numerous submissions. They address topics around networking, technology and systems, including but not limited to collaborative cloud computing, architecture and evaluation, collaborative applications, sensors and Internet of Things (IoT), security. The Arctic has again become one of the leading issues on the international foreign policy agenda, in a manner unseen since the Cold War. Drawing on the perspectives of geo-politics and international law, this Handbook offers fresh insights and perspectives on the most pressing issues, grouped under the headings of political ascendancy, climate and environmental issues, resources and energy, and the response and policies of affected countries.

OECD's 2014 Economic Survey of the United States examines recent economic developments, policies and prospects. Special chapters cover improving well-being and making the best of new energy resources.

This Special Issue of the journal *Entropy*, titled "Information Geometry I", contains a collection of 17 papers concerning the foundations and applications of information geometry. Based on a geometrical interpretation of probability, information geometry has become a rich mathematical field employing the methods of differential geometry. It has numerous applications to data science, physics, and neuroscience. Presenting original research, yet written in an accessible, tutorial style, this collection of papers will be useful for scientists who are new to the field, while providing an excellent reference for the more experienced researcher. Several papers are written by authorities in the field, and topics cover the foundations of information geometry, as well as applications to statistics, Bayesian inference, machine learning, complex systems, physics, and neuroscience.

This book examines the lives and contributions of American women physicists who were active in the years following World War II, during the middle decades of the 20th century. It covers the strategies they used to survive and thrive in a time where their gender was against them. The percentage of PhD's in physics has risen from 6% in 1983 to 20% in 2012 (an all-time high for women). By understanding the history of women in physics, these gains can continue. It discusses two major classes of women physicists; those who worked on military projects, and those who worked in industrial laboratories and at universities largely in the late 1940s and 1950s. While it includes minimal discussion of physics and physicists in the 1960s and later, this book focuses on the challenges and successes of women physicists in the years immediately following World War II and before the eras of affirmative actions and the use of the personal computer.

Innovation has become a buzzword that promises dramatic changes in almost every field of business. Absent from this attention is a serious discussion of the ethical sides of dramatic change. To address this, editors Georges Enderle and Patrick E. Murphy gather a team of experts to fully examine the ethics of innovation within business and the economy in this standout addition to the *Studies in TransAtlantic Business Ethics* series.

The updated and expanded third edition of this book focuses on the multi-disciplinary coupling between flight-vehicle hardware alternatives and enabling propulsion systems. It discusses how to match near-term and far-term aerospace vehicles to missions and provides a comprehensive overview of the subject, directly contributing to the next-generation space infrastructure, from space tourism to space exploration. This holistic treatment defines a mission portfolio addressing near-term to long-term space transportation needs covering sub-orbital, orbital and escape flight profiles. In this context, a vehicle configuration classification is introduced covering alternatives starting from the dawn of space access. A best-practice parametric sizing approach is introduced to correctly design the flight vehicle for the mission. This technique balances required mission with the available vehicle solution space and is an essential capability sought after by technology forecasters and strategic planners alike.

This book discusses renewable energy policy in oil and gas-wealthy Arab states and presents the reader with a well-informed overview of the national energy systems – both conventional and renewable. It also seeks to answer questions on the poor growth prospects by contextualizing the various national renewable energy production efforts in the other energy sectors, national and international power politics and energy markets. With a focus on the UAE and Algeria – who were both vocal in their promotion of renewable energies for domestic and export-oriented power production – these two cases studies are highlighted with common features both in terms of policies and energy systems and showing the vast differences between the governance contexts of the lower Gulf and of North Africa. Both country case studies also feature sections on the most visible renewable energy project connected to the country – the UAE's Masdar project and Algeria's energy efforts and relation to the trans-Mediterranean renewable energy efforts around the Desertec project. Building on original research in both countries and over 90 interviews with senior stakeholders in half a dozen states, this book seeks to contribute to both Middle Eastern and (renewable) energy policy studies. In combination with the transition management approach as innovation theory model this book covers a timely and important topic with a wide-ranging audience, both geographically and in terms of scientific background.

According to the United Nations, 9.6 billion people will inhabit our planet by 2050. Population growth and movement will have an enormous impact on global dynamics in the twenty-first century, in both the developing world as well as in advanced industrialized societies. In light of this global demographic reality, this issue of the *Georgetown Journal of International Affairs* focuses on the topic of "Destabilizing Demographics," exploring the opportunities and challenges presented by dynamic population patterns and structures. Demographic shifts affect multiple facets of international affairs, impacting economies, modifying politics, and reshaping the fabric of our societies. These changes could have catastrophic international consequences if ignored or evaded. However, as this issue's Forum demonstrates, the future holds promise for those who choose to reorganize on the cusp of significant population transformation. Adaptation as a form of mitigation must be informed by diverse solutions and multi-sectoral cooperation. Consider, for example, the intersection of family planning and climate change, or the connection between gender gaps and crime. Through pragmatic policymaking and international collaboration, seismic demographic change may not necessitate disaster. We round out this issue with articles regarding decidedly twenty-first century concerns: communication, integration, and globalization. Moha Ennaji describes the challenges of Berber language incorporation in Morocco and its significance to democratic reform. Dan Saxon examines the role of human judgment in semi-autonomous weapons use, questioning the ethics of unmanned machines. Andrés

Monroy-Hernández and Luis Daniel Palacios analyze the utility, efficacy, and implications of citizen journalism within Mexico's ongoing drug war. And Lawrence Gostin and Alexandra Phelan explore how, in an increasingly interconnected world, the international community can collectively prevent and control the spread of infectious diseases. The Georgetown Journal of International Affairs is the official publication of the Edmund A. Walsh School of Foreign Service at Georgetown University. Each issue of the journal provides readers with a diverse array of timely, peer-reviewed content penned by top policymakers, business leaders, and academic luminaries. The Journal takes a holistic approach to international affairs and features a 'Forum' that offers focused analysis on a specific key issue with each new edition of the publication, as well as nine regular sections: Books, Business & Economics, Conflict & Security, Culture & Society, Law & Ethics, A Look Back, Politics & Diplomacy, Science & Technology, and View from the Ground.

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.

The problems we face in the 21st century require innovative thinking from all of us. Be it students, academics, business researchers or government policy makers. Hopes for improving our healthcare, food supply, community safety and environmental sustainability depend on the pervasive application of research solutions. The research heroes who take on the immense problems of our time face bigger than ever challenges, but if they adopt potent guiding principles and effective research lifecycle strategies, they can produce the advances that will enhance the lives of many people. These inspirational research leaders will break free from traditional thinking, disciplinary boundaries, and narrow aspirations. They will be bold innovators and engaged collaborators, who are ready to lead, yet open to new ideas, self-confident, yet empathetic to others. In this book, Ben Shneiderman recognizes the unbounded nature of human creativity, the multiplicative power of teamwork, and the catalytic effects of innovation. He reports on the growing number of initiatives to promote more integrated approaches to research so as to promote the expansion of these efforts. It is meant as a guide to students and junior researchers, as well as a manifesto for senior researchers and policy makers, challenging widely-held beliefs about how applied innovations evolve and how basic breakthroughs are made, and helping to plot the course towards tomorrow's great advancements.

This report discusses the current state of knowledge on how to build climate resilience in developing countries.

This book explores the interrelationship between ideology, the state, and education reforms, placing it in a global context. It examines some of the major education reforms and policy issues in a global culture, particularly in light of recent shifts in quality and standards-driven education, and policy research. The book critiques the neo-liberal ideological imperatives of current education and policy reforms, and illustrates the way the shifts in the relationship between the state and education policy affect current trends in education reforms and schooling globally. With this as its focus, the book's individual chapters highlight hand-picked scholarly research on major discourses in the field of comparative education. A compendium of the very latest thinking on the subject, the book – like the other volumes in the series – offers a state-of-the-art sourcebook for researchers, practitioners and policymakers alike. Not only do the chapters offer a timely overview of current issues affecting comparative education and education policy research in what is now a global educational culture; they also outline future directions that education and policy reforms could take. By doing so, they provide a comprehensive picture of the intersecting and diverse discourses of globalisation and policy-driven reforms in education. Individual chapters critically assess the dominant discourses and debates on education and policy reforms. Using diverse comparative education paradigms from critical theory to historical-comparative research, they address globalisation, ideology and democracy and examine both the reasons for and outcomes of education reforms and policy change. As such, they provide an informed critique of models of quality and standards-driven education reforms that are informed by Western dominant ideologies and social values.

Presents various challenges faced by security policy makers and risk analysts, and mathematical approaches that inform homeland security policy development and decision support Compiled by a group of highly qualified editors, this book provides a clear connection between risk science and homeland security policy making and includes top-notch contributions that uniquely highlight the role of risk analysis for informing homeland security policy decisions. Featuring discussions on various challenges faced in homeland security risk analysis, the book seamlessly divides the subject of risk analysis for homeland security into manageable chapters, which are organized by the concept of risk-informed decisions, methodology for applying risk analysis, and relevant examples and case studies. *Applied Risk Analysis for Guiding Homeland Security Policy and Decisions* offers an enlightening overview of risk analysis methods for homeland security. For instance, it presents readers with an exploration of radiological and nuclear risk assessment, along with analysis of uncertainties in radiological and nuclear pathways. It covers the advances in risk analysis for border security, as well as for cyber security. Other topics covered include: strengthening points of entry; systems modeling for rapid containment and casualty mitigation; and disaster preparedness and critical infrastructure resilience. Highlights how risk analysis helps in the decision-making process for homeland security policy Presents specific examples that detail how various risk analysis methods provide decision support for homeland security policy makers and risk analysts Describes numerous case studies from academic, government, and industrial perspectives that apply risk analysis methods for addressing challenges within the U.S. Department of Homeland Security (DHS) Offers detailed information regarding each of the five DHS missions: prevent terrorism and enhance security; secure and manage our borders; enforce and

administer our immigration laws; safeguard and secure cyberspace; and strengthen national preparedness and resilience. Discusses the various approaches and challenges faced in homeland risk analysis and identifies improvements and methodological advances that influenced DHS to adopt an increasingly risk-informed basis for decision-making. Written by top educators and professionals who clearly illustrate the link between risk science and homeland security policy making. Applied Risk Analysis for Guiding Homeland Security Policy and Decisions is an excellent textbook and/or supplement for upper-undergraduate and graduate-level courses related to homeland security risk analysis. It will also be an extremely beneficial resource and reference for homeland security policy analysts, risk analysts, and policymakers from private and public sectors, as well as researchers, academics, and practitioners who utilize security risk analysis methods.

The 2009 United Nations climate conference in Copenhagen is often represented as a watershed in global climate politics, when the diplomatic efforts to negotiate a successor agreement to the Kyoto Protocol failed and was replaced by a fragmented and decentralized climate governance order. In the post-Copenhagen landscape the top-down universal approach to climate governance has gradually given way to a more complex, hybrid and dispersed political landscape involving multiple actors, arenas and sites. The Handbook contains contributions from more than 50 internationally leading scholars and explores the latest trends and theoretical developments of the climate governance scholarship.

"An excellent objective explanation of the history, science, technology, politics, environmental concerns, and economics of the shale gas boom. The author clearly has great practical experience of the science and technology of shale gas development and shows a deep understanding of the environmental and economic issues." --Andrew Stone, Executive Director, American Ground Water Trust. New technology has opened vast reserves of "unconventional" natural gas and oil from shales like the Marcellus in the Appalachian Basin, making the United States essentially energy independent for the first time in decades. Shale gas had its origins in the oil embargos and energy crises of the 1970s, which led to government research to increase domestic energy supplies. The first large-scale shale gas production was successful on the Barnett Shale in Texas in the late 1990s, followed a few years later by the Marcellus Shale in Pennsylvania. Shale gas has changed thinking about fossil energy supplies worldwide, but the development of these resources has been controversial. Activists have made claims that hydraulic fracturing may contribute to climate change, threaten groundwater resources, and pose risks to terrestrial and aquatic ecosystems, and human health. This volume explores the geology, history, technology, and potential environmental impacts of Marcellus Shale gas resources.

How can markets help us adapt to the challenges of climate change? Editor Terry L. Anderson brings together this collection of essays featuring the work of nine leading policy analysts, who argue that market forces are just as important as government regulation in shaping climate policy—and should be at the heart of our response to helping societies adapt to climate change. Anderson notes in his introduction that most current climate policies such as the Paris Agreement require hard-to-enforce collective action and focus on reducing or mitigating greenhouse gases rather than adapting to their negative effects. Adaptive actions can typically deliver much more, faster and more cheaply than any realistic climate policy. The authors tackle a range of issues: the hidden costs of renewable energy sources, the political obstacles surrounding climate change policy, insurance and financial instruments for pricing risk of exposure to the effects of climate change, and more. Reliance on emerging renewable energies and a carbon tax are not enough to prevent the effects of global warming, they argue. We must encourage more private action and market incentives to adapt to a rapidly changing climate.

A Financial Times "Best Book of 2017: Economics" 800-CEO-Read "Best Business Book of 2017: Current Events & Public Affairs" Economics is the mother tongue of public policy. It dominates our decision-making for the future, guides multi-billion-dollar investments, and shapes our responses to climate change, inequality, and other environmental and social challenges that define our times. Pity then, or more like disaster, that its fundamental ideas are centuries out of date yet are still taught in college courses worldwide and still used to address critical issues in government and business alike. That's why it is time, says renegade economist Kate Raworth, to revise our economic thinking for the 21st century. In Doughnut Economics, she sets out seven key ways to fundamentally reframe our understanding of what economics is and does. Along the way, she points out how we can break our addiction to growth; redesign money, finance, and business to be in service to people; and create economies that are regenerative and distributive by design. Named after the now-iconic "doughnut" image that Raworth first drew to depict a sweet spot of human prosperity (an image that appealed to the Occupy Movement, the United Nations, eco-activists, and business leaders alike), Doughnut Economics offers a radically new compass for guiding global development, government policy, and corporate strategy, and sets new standards for what economic success looks like. Raworth handpicks the best emergent ideas—from ecological, behavioral, feminist, and institutional economics to complexity thinking and Earth-systems science—to address this question: How can we turn economies that need to grow, whether or not they make us thrive, into economies that make us thrive, whether or not they grow? Simple, playful, and eloquent, Doughnut Economics offers game-changing analysis and inspiration for a new generation of economic thinkers.

Various cellular processes underlying plant development and response to environmental cues rely on a dynamic interplay between membranes and the cytoskeleton, e.g. vesicle and organelle trafficking, endocytosis, exocytosis, and signal transduction. In recent years, significant progress in the understanding of such interplay has been achieved and several critical links between membranes and the cytoskeleton have been characterized. As an example, recent work has clarified how auxin promotes the reorganization of cortical actin filaments by the activation of Rho GTPase pathways, and how such reorganization in turn locally modifies endocytosis and/or exocytosis and directs asymmetric distribution of PIN family of auxin transporters. Another recent achievement is the characterization of the Rho- and microtubule-driven mechanism by which the cell wall architecture is established. In particular, the elegant work by Oda and Fukuda (Science

337 p.1333, 2012) provides evidence that secondary wall patterning in xylem vessel primarily relies on two processes: a local activation of the plant Rho GTPase ROP11 and a mutual, MIDD1-mediated, inhibitory interaction between active ROP domains and cortical microtubules. Additional examples include recent genetic evidence that microtubule and actin filament interacting/regulatory proteins, such as MAP65-1 and capping protein, function as transducers of membrane lipid signaling into changes in cytoskeleton dynamics and organization. This Research Topic aims at collecting a comprehensive set of articles dealing with cellular processes involving membrane-cytoskeleton interactions. Its scope extends beyond the specific fields defined by the above examples and includes intracellular trafficking, host-pathogen interactions, response to biotic and abiotic stresses and hormonal regulation of growth. We hope that this Research Topic will also highlight critical questions that need to be addressed in the future. We welcomed Original Research Articles, Technical/Methodological Advances (e.g. analysis of cytoskeleton dynamics close to membranes), Reviews and Mini Reviews that can expand our understanding of how and why membranes and the cytoskeleton interact.

Why does knowing more mean believing—and doing—less? A prescription for change The more facts that pile up about global warming, the greater the resistance to them grows, making it harder to enact measures to reduce greenhouse gas emissions and prepare communities for the inevitable change ahead. It is a catch-22 that starts, says psychologist and economist Per Espen Stoknes, from an inadequate understanding of the way most humans think, act, and live in the world around them. With dozens of examples—from the private sector to government agencies—Stoknes shows how to retell the story of climate change and, at the same time, create positive, meaningful actions that can be supported even by deniers. In *What We Think About When We Try Not To Think About Global Warming*, Stoknes not only masterfully identifies the five main psychological barriers to climate action, but addresses them with five strategies for how to talk about global warming in a way that creates action and solutions, not further inaction and despair. These strategies work with, rather than against, human nature. They are social, positive, and simple—making climate-friendly behaviors easy and convenient. They are also story-based, to help add meaning and create community, and include the use of signals, or indicators, to gauge feedback and be constantly responsive. Whether you are working on the front lines of the climate issue, immersed in the science, trying to make policy or educate the public, or just an average person trying to make sense of the cognitive dissonance or grapple with frustration over this looming issue, *What We Think About When We Try Not To Think About Global Warming* moves beyond the psychological barriers that block progress and opens new doorways to social and personal transformation.

Our current climate is strongly influenced by atmospheric composition, and changes in this composition are leading to climate change. *Physics of Radiation and Climate* takes a look at how the outward flow of longwave or terrestrial radiation is affected by the complexities of the atmosphere's molecular spectroscopy. This book examines the planet in its current state and considers the radiation fluxes, including multiple scattering, photochemistry, and the ozone layer, and their impact on our climate overall. Starting from the physical fundamentals of how electromagnetic radiation interacts with the various components of the Earth's atmosphere, the book covers the essential radiation physics leading to the radiative transfer equation. The book then develops the central physics of the interaction between electromagnetic radiation and gases and particles: absorption, emission, and scattering. It examines the physics that describes the absorption and emission of radiation, using quantum mechanics, and scattering, using electromagnetism. It also dedicates a detailed chapter to aerosols, now recognized as a key factor of climate change. Written to be used for a first course in climate physics or a physics elective, the text contains case studies, sample problems, and an extensive reference list as a guide for further research. In addition, the authors: Provide a complete derivation of molecular spectroscopy from quantum mechanical first principles Present a formal derivation of the scattering of radiation by molecules and particles Include the latest results from the Intergovernmental Panel on Climate Change Fifth Assessment Report (IPCC AR5) *Physics of Radiation and Climate* shows how radiation measurements are used to aid our understanding of weather and climate change and provides an introduction to the atmosphere. This book covers the key branches of physics with a specific focus on thermodynamics, electromagnetism, and quantum mechanics.

This book is intended for anyone who is interested in a real physical image and order of the physical world surrounding us. In this book Einstein's destruction of physics is documented. The physical reality of gravity, inertial forces, mass, time, double-slit experiment is debunked. It shows that Quarks and Higgs bosons do not exist and that all elementary particles, all rigid matter and all force fields in the Universe are created from compression of ether. It shows that Einstein, after 1916 became a more enthusiastic advocate of the proven existence of the ether than supporters of the ether before 1905. The aim of this book is to return physics from its way of metaphysics in the 20th century on the way of the physical reality in the 21st century. This second edition of this book was augmented by twenty pages compared to its first edition. After this augmentation it appears that the argumentation about the unacceptability of the ill-founded physical theories of the 20th century represents a compact corpus.

*The Science of Armour Materials* comprehensively covers the range of armor materials from steels and light alloys, through glasses and ceramics, to fibers, textiles, and protective apparel. The book also discusses aspects of analytical and numerical modeling, as well as laboratory-based high-strain rate testing and ballistic testing methodologies. Each chapter is written from an international perspective, including reviews of the current global literature, and incorporates case studies that focus upon real life applications, research outcomes, and lessons learned. The threat spectrum is restricted to small arms ammunition, high velocity fragments, and stab and spike attacks, as well as blast loadings. Features input from an editor who is an expert in his field: Dr. Ian Crouch, the author of over 80 publications in his field, with three patents to his name Provides systematic and comprehensive coverage of armor materials, modeling, and testing Offers a cross-disciplinary approach that brings together expertise in materials science and defense engineering Discusses aspects of analytical and numerical modeling, as well as laboratory-based high-strain rate testing and ballistic testing methodologies

Making a fresh contribution to the political history of science, this book explores the connections between the science policies of three countries that each experienced considerable political upheaval in the twentieth century: Spain, Italy and Argentina. By focussing on these three countries, the contributors are able to present case studies that highlight the characteristics and specificities of the democratic and dictatorial political processes involved in the production of science and technology. The focus

on dictatorship presents the opportunity to expand our knowledge -beyond the more extensive literature about science in Nazi Germany and Stalinist USSR -about the level of political involvement of scientists in non-democratic contexts and to what extent they act as politicians in different contexts. Key topics covered include the new forms of organization and institutionalization of science in the twentieth century; the involvement of scientific communities in the governance of science and its institutions; the role of ideology in scientific development; the scientific practices adopted by scientific communities in different contexts; and the characteristics of science and technology produced in these contexts.

The American economy faces two deep problems: expanding innovation and raising the rate of quality job creation. Both have roots in a neglected problem: the resistance of Legacy economic sectors to innovation. While the U.S. has focused its policies on breakthrough innovations to create new economic frontiers like information technology and biotechnology, most of its economy is locked into Legacy sectors defended by technological/ economic/ political/ social paradigms that block competition from disruptive innovations that could challenge their models. Americans like to build technology "covered wagons" and take them "out west" to open new innovation frontiers; we don't head our wagons "back east" to bring innovation to our Legacy sectors. By failing to do so, the economy misses a major opportunity for innovation, which is the bedrock of U.S. competitiveness and its standard of living. Technological Innovation in Legacy Sectors uses a new, unifying conceptual framework to identify the shared features underlying structural obstacles to innovation in major Legacy sectors: energy, air and auto transport, the electric power grid, buildings, manufacturing, agriculture, health care delivery and higher education, and develops approaches to understand and transform them. It finds both strengths and obstacles to innovation in the national innovation environments - a new concept that combines the innovation system and the broader innovation context - for a group of Asian and European economies. Manufacturing is a major Legacy sector that presents a particular challenge because it is a critical stage in the innovation process. By increasingly offshoring production, the U.S. is losing important parts of its innovation capacity. "Innovate here, produce here," where the U.S. took all the gains of its strong innovation system at every stage, is being replaced by "innovate here, produce there," which threatens to lead to "produce there, innovate there." To bring innovation to Legacy sectors, authors William Bonvillian and Charles Weiss recommend that policymakers focus on all stages of innovation from research through implementation. They should fill institutional gaps in the innovation system and take measures to address structural obstacles to needed disruptive innovations. In the specific case of advanced manufacturing, the production ecosystem can be recreated to reverse "jobless innovation" and add manufacturing-led innovation to the U.S.'s still-strong, research-oriented innovation system.

Rapidly generating and processing large amounts of data, supercomputers are currently at the leading edge of computing technologies. Supercomputers are employed in many different fields, establishing them as an integral part of the computational sciences. Research and Applications in Global Supercomputing investigates current and emerging research in the field, as well as the application of this technology to a variety of areas. Highlighting a broad range of concepts, this publication is a comprehensive reference source for professionals, researchers, students, and practitioners interested in the various topics pertaining to supercomputing and how this technology can be applied to solve problems in a multitude of disciplines.

Practical Sports Coaching is a thorough and engaging guide for all sports coaching students and practitioners. Drawing on real-life case studies and examples, the book is designed to develop practical coaching skills and provides readers with the methods and tools they need to become an expert coach. Structured around all facets of the coaching process, the text comprehensively covers topics such as: preparation for coaching mentoring the philosophy of coaching direct intervention coaching methods the use of modern technology. The book's practical approach allows the reader to consider common challenges faced by coaches, suggesting solutions to performance concerns and preparing students for the realities of professional sports coaching. A companion website containing presentation slides and useful weblinks makes the book a complete resource for students and lecturers alike. Practical Sports Coaching helps to bridge the gap between theory and practical coaching skills, and is an essential text for coaching students looking to deepen their understanding of sports coaching and experienced coaches developing their own practical skills.

South Asia has developed from a group of newly independent post-Colonial states of at most secondary importance to the wider world to its current position as a region of central strategic importance to both global economic development and world peace and stability. This Atlas highlights the global significance of South Asia in relation to economic, geopolitical and strategic interests. It provides a coherent descriptive and analytical account of the key elements of the complex societies that make up the region and its component countries. Illustrated with more than 100 original maps and offering concise entries on key issues, the book is structured thematically in these sections: Global Context Geographical Environments Historical Evolution of South Asia Key Issues in modern South Asia Economy and Security Designed for use in teaching undergraduate and graduate classes and seminars in geography, history, economics, anthropology, international relations, political science and the environment as well as regional courses on the South Asia, this book is also a comprehensive reference source for libraries and decision makers focusing on South Asia.

[Copyright: ab5c4f040b85bb698b749757e8ccac07](http://www.copyright.com/ab5c4f040b85bb698b749757e8ccac07)