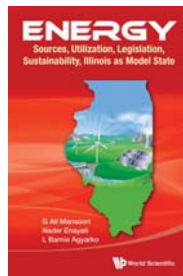


Energy

Sources, Utilization, Legislation, Sustainability, Illinois as Model State

G. Ali Mansoori, Nader Enayati, and L. Barnie Agyarko

World Scientific, 2016. \$214.00 (812 pp.). ISBN 978-981-4704-00-7



On 12 December 2015, nearly 200 countries adopted the historic Paris Agreement, negotiated at the 21st Conference of Parties (COP21). The accord aims to limit, or even halt, global warming through the reduction of greenhouse gas emissions. Any discussion of greenhouse gas reduction must factor in energy management. A new book by G. Ali Mansoori, Nader Enayati, and L. Barnie Agyarko, published shortly after COP21, aims to provide students, policymakers, and the general public with an understanding of the various factors related to that complex issue. In addition to addressing the topics in its subtitle, *Energy: Sources, Utilization, Legislation, Sustainability, Illinois as Model State* discusses energy storage and conversion methods, environmental concerns, and the economics and future trends of energy-conversion technologies.

Energy includes many illustrations, flow charts, tables, and graphs—both descriptive and quantitative. Even though it contains a great deal of science and engineering in the form of equations, the book is written in a language that is easy to understand. It covers all the major energy sources—fossil fuels, nuclear, wind, solar, geothermal, and biomass—and provides real examples and illustrations of energy-conversion and storage methods.

On the societal side, *Energy* gives examples of how private businesses and federal, state, and local governments have gotten involved to promote energy efficiency and environmental protection; many of those efforts demonstrate the effectiveness of collective action. For example, several states and the federal government offer tax incentives to commercial, industrial, and residential sectors for installation of solar panels and other renewable-energy systems.

Illinois, one of the more progressive US states, is moving toward energy self-sufficiency and a clean environment; some of its efforts make it possible for the state to reduce its dependency on coal and other fossil fuels. This book contains

several case studies showing how that is being achieved. For instance, by the end of 2013, 91 towns in Illinois had purchased 100% renewable electricity. Also, Illinois residents can use their bulk purchasing power to solicit bids from electricity providers. And because the state's weather is highly variable, the government has invested in geothermal- and seasonal-energy storage systems.

Many books cover energy, but this book has it all. It treats all the major energy sources, and it also discusses carbon dioxide. Along with its real-world examples and illustrations of energy-conversion and storage methods are discussions of the sustainability of renewables. The concluding material features a well-put-

together glossary of energy-related terms.

Every chapter presents various ways for a country, state, or community to achieve and sustain energy sufficiency and a clean environment. Chapter 2, for example, discusses the use of advanced clean-coal technology projects that can reduce environmental pollution, a topic that should interest those in coal-producing and coal-burning states. And on the national level, chapter 6 discusses investments being made in fusion-energy research and in planning for safe storage of nuclear wastes.

Energy is essentially a recipe for energy and environmental sustainability and a guidebook for the implementation of COP21. I recommend it for engineering and science students, energy researchers, policymakers, legislators, environmentalists, and any other individuals interested in energy studies. It is a great book and I expect it will have a tremendous impact.

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Hollyweird Science

From Quantum Quirks to the Multiverse

Kevin R. Grazier and Stephen Cass

Springer, 2015. \$24.99 paper (308 pp.). ISBN 978-3-319-15071-0

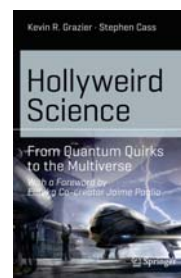
Due to interest from segments of the public seeking to learn about the science they read in books or see on screen, many of the large and thriving pop-culture gatherings, such as San Diego's Comic-Con and Atlanta's Dragon Con, now feature dedicated science programs. To make fictional science more accurate, the Los Angeles-based Science and Entertainment Exchange connects entertainment-industry professionals with science experts.

Hollyweird Science: From Quantum Quirks to the Multiverse takes a page from the science tracks at pop-culture conventions and draws from interviews with scientists and storytellers who are pursuing the goals of the Science and Entertainment Exchange. Authors Kevin Grazier and Stephen Cass mix lighthearted humor and references to films and popular TV series into their discussion of the real science portrayed in fictional settings.

Unlike books such as *The Physics of*

Superheroes (Avery, 2006) by James Kakalios and *The Science of Interstellar* (W. W. Norton, 2014) by Kip Thorne, *Hollyweird Science* discusses a wide range of depictions of science and scientists in popular culture. Be prepared for references to *Star Wars* and *Star Trek*, *Big Bang Theory* and *Stargate SG-1*. Although the title references "science," the book focuses on physics and astronomy. The text is illustrated with photographs from movies and television and images from such science-gathering instruments as IR cameras and the *Hubble Space Telescope*. It also includes lots of science data.

Hollyweird Science is written for a broad audience. It has enough depth—by its inclusion of equations, such as those for kinetic energy, the Schwarzschild radius, Wien's law, length contrac-



tion, and time dilation—that it can be used in an introductory physics course or a first-year undergraduate seminar. The numerical examples that accompany the equations will help instructors to generate assignments. But the book is not a class text; for example, it does not include end-of-chapter problems. Indeed, it is written in a style suitable for lay readers. The equations, and other more technical material, are incorporated in “sciences boxes” that can be skipped. But even those boxes are written at a level that will allow readers previously unfamiliar with the basic physics to gain insight.

The book is particularly strong when covering radiation and extrasolar planets. The chapter “Radiation: An All-Time Glow” describes the different types of particles and electromagnetic radiation and presents examples that range from fun (using Wien’s law to determine the temperature of the Human Torch from *Fantastic Four*) to timely (relating the security scanners in *Total Recall* to millimeter-wave scanners in airports). The chapter “Braver Newer Worlds” contains good discussions of the definitions of a planet and the habitable zone. The physics of Miller’s world from *Interstellar* are deduced from clues in the film; the authors calculate its gravity and gravitational time-dilation effects near the black hole. And the chapter “Moving in Stereo: Parallel Universes” touches on the multiverse mentioned in the book’s subtitle and cites the famous “Mirror, Mirror” episode from the original series of *Star Trek* to illustrate the concept.

One of the greatest strengths of on-screen science is the way it connects science to society. The book addresses that connection, but not as well as I would have wanted. The chapter “Hollywood Scientists: Reel and Imaginary” is devoted to representations of scientists in media. For example, the authors cite statistics showing that through decades of horror films, scientists have been more frequently portrayed as villains than heroes. Unfortunately, though, that chapter is the book’s weakest.

Grazier and Cass correctly call out the Hollywood stereotype of scientists as white men, and although they then focus on female scientists, they fail to explore the representation of scientists of color. Most of the experts inter-

viewed are white men; even quotes extracted from the literature are primarily from white men. The book itself shows many more men than women in the photographs, and for both sexes, the majority are white. The demographics of the book’s selected photos may be emblematic of Hollywood’s shortcomings, but it also unintentionally reinforces stereotypes.

Overall, *Hollyweird Science* is an entertaining read for those who enjoy science

fiction media and want to know more about the reality behind the cinematic magic. But instructors who assign this book should be prepared to tackle the topic of stereotypes to a greater degree than the authors did. I hope the authors themselves will address the issue more successfully in the already announced sequel *Beyond Hollyweird Science*.

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