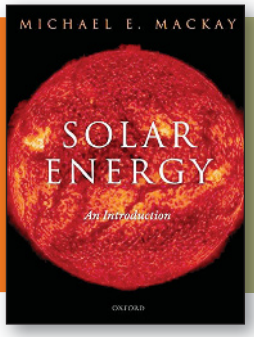


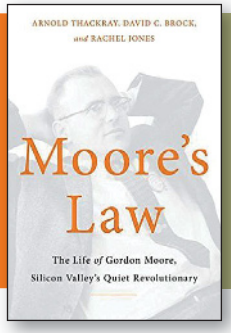
Solar Energy: An Introduction
Michael E. Mackay
Oxford University Press, 2015
336 pages, $98.50
(paperback $49.95, e-book $48.99)
ISBN 978-0-19-965210-5

This book provides an introduction to all aspects of solar energy, from photovoltaic devices to active and passive solar thermal energy conversion. Its main characteristic is that it helps to gain an overview on these topics and at the same time provides some detailed knowledge with emphasis on the quantitative approach.

The book deals with both photovoltaics (PV) and solar thermal energy processes. The first chapter explains why it is important to use solar energy, the current energy usage on Earth, and the practical advantages of using PV technologies. Chapter 2 describes the reactions taking place in the core of the sun and producing solar light, and calculates through earth-sun geometric relations the amount of solar light reaching the earth's atmosphere and what part of the irradiation arrives on a terrestrial device. The third chapter provides the basic principles used in the rest of the book, such as the laws of thermodynamics and explanations of the properties of the optimal materials for PV and for solar thermal applications. Chapter 4 discusses semiconductor physics that is fundamental to a deep understanding of device functionality. The fifth chapter covers absorption and explains how much radiation can be absorbed by a semiconductor to generate current (in a solar cell) or heat energy (in solar thermal devices), depending on the material electronic structure. The next chapter describes how a solar cell works and what the electrical characteristics look like; the diode equation is derived, the important parasitic effects—such as shunt and series resistance—are determined, and their effect on cell performance is illustrated. Next, the author discusses solar towers where heated air is channeled into a chimney to power a turbine (chapter 7), a topic not easily found in other books, and on the solar energy collector to heat fluids (chapter 8). In the last chapter, the energy generation from solar thermal is discussed in terms of the thermodynamic cycle to explain the heat to work transformation, the so-called Rankine cycle.

The book is clear and, despite its small size, very dense in information. It stimulates learning by tackling the subject from many points of view. The flow of the book is the result of the author's lectures on solar energy to undergraduate and graduate students, and for this reason the text used in paragraphs, exercises, examples, etc. seems a verbal discussion—the language is fluid but rigorous, reasoned, and with many numerical examples. The author's approach is that it is not as important to learn the notions as it is to learn a method of study that enables you to deal with new difficult topics and problems. The figures and schematics are very useful, but the focus is placed on the text. A list of exercises is offered at the end of each chapter, and many examples are reported in each paragraph. The book can be useful to researchers who want to design or improve their devices, and to students, but definitely much more to professors who want to be inspired to prepare stimulating review lessons.

***Reviewer: Rosaria A. Puglisi** of the Institute for Microelectronics and Microsystems of the National Research Council in Catania, Italy.*



Moore's Law: The Life of Gordon Moore, Silicon Valley's Quiet Revolutionary
Arnold Thackray, David C. Brock, and Rachel Jones
Basic Books, 2015
530 pages, $35.00
ISBN 978-0-465-05564-7

Five decades ago, Gordon Moore, who would go on to co-found Intel Corporation, made a prescient observation about the exponential advancement of semiconductor technology with a corresponding decrease in device cost. His prediction about the pace of doubling the number of transistors in an integrated circuit came to be known eponymously as Moore's Law and has held true for 50 years. He also foresaw, way back in 1965, the development of home computers, electronic controls in automobiles, portable communications systems, and electronic wristwatches. Moore's fascinating life, characterized by relentless innovation, charity, and breathtaking humility, is the subject of this comprehensive authorized biography. The enthralling narrative is the product of collaboration between an academic (Thackray), a technology historian (Brock), and a journalist (Jones), and draws its material from numerous interviews, Moore's meticulously maintained notes and professional records, personal papers, industry data, published volumes, and news accounts.

The book has 11 chapters sandwiched between a prelude that offers a peek at Moore's brilliance and a coda. The narrative begins with the westward migration of Moore's great grandfather from Missouri to California in the mid-19th century just before the Gold Rush, the