



Solar Energy: An Introduction

By Michael E. Mackay

Download now

Read Online →

Solar Energy: An Introduction By Michael E. Mackay

Solar Energy presents an introduction to all aspects of solar energy, from photovoltaic devices to active and passive solar thermal energy conversion, giving both a detailed and broad perspective of the field. It is aimed at the beginner involved in solar energy or a related field, or for someone wanting to gain a broader perspective of solar energy technologies.

A chapter considering solar radiation, basic principles applied to solar energy, semiconductor physics, and light absorption brings the reader on equal footing with the technology of either solar generated electrical current or useful heat. Details of how a solar cell works and then production of current from a photovoltaic device is discussed. Characterization of a solar cell is examined, allowing one the ability to interpret the current-voltage relation, followed by discussion of parameter extraction from this relation. This information can be used to understand what limits the performance of a given solar cell with the potential to optimize its performance. Applications of solar thermal energy are reviewed in detail from passive applications, for example the solar chimney, to active, such as the solar (power) tower, flat plate water heater, and solar thermal electricity generation. Consistency of analysis between the solar thermal applications is used enabling the reader to fully appreciate similarities and dissimilarities between these technologies. Ultimately, the scientist or engineer can understand existing systems, either photovoltaic or solar thermal devices, and design their own technology given the information in this book.

↓ [Download Solar Energy: An Introduction ...pdf](#)

📄 [Read Online Solar Energy: An Introduction ...pdf](#)

Solar Energy: An Introduction

By Michael E. Mackay

Solar Energy: An Introduction By Michael E. Mackay

Solar Energy presents an introduction to all aspects of solar energy, from photovoltaic devices to active and passive solar thermal energy conversion, giving both a detailed and broad perspective of the field. It is aimed at the beginner involved in solar energy or a related field, or for someone wanting to gain a broader perspective of solar energy technologies.

A chapter considering solar radiation, basic principles applied to solar energy, semiconductor physics, and light absorption brings the reader on equal footing with the technology of either solar generated electrical current or useful heat. Details of how a solar cell works and then production of current from a photovoltaic device is discussed. Characterization of a solar cell is examined, allowing one the ability to interpret the current-voltage relation, followed by discussion of parameter extraction from this relation. This information can be used to understand what limits the performance of a given solar cell with the potential to optimize its performance. Applications of solar thermal energy are reviewed in detail from passive applications, for example the solar chimney, to active, such as the solar (power) tower, flat plate water heater, and solar thermal electricity generation. Consistency of analysis between the solar thermal applications is used enabling the reader to fully appreciate similarities and dissimilarities between these technologies. Ultimately, the scientist or engineer can understand existing systems, either photovoltaic or solar thermal devices, and design their own technology given the information in this book.

Solar Energy: An Introduction By Michael E. Mackay Bibliography

- Sales Rank: #1568986 in Books
- Published on: 2015-08-18
- Released on: 2015-08-18
- Original language: English
- Number of items: 1
- Dimensions: 7.40" h x .50" w x 9.60" l, 1.24 pounds
- Binding: Paperback
- 336 pages

 [Download Solar Energy: An Introduction ...pdf](#)

 [Read Online Solar Energy: An Introduction ...pdf](#)

Editorial Review

Review

"Solar radiation is likely to be a key part of our energy future. This textbook presents, with admirable clarity and accessibility, the relevant physics, the technical approach and challenges, and the geopolitical arguments, behind the utilisation of solar power on a global scale." --*Fred Taylor, University of Oxford, UK*

"Michael Mackay's *Solar Energy* is a useful contribution to the field by combining photovoltaics and solar thermal energy - two subjects not often seen together in one textbook. The topics are explained at an approachable level, making the book a good entry text for a student or a teacher who may wish to understand solar energy conversion from this broader point of view." --*Tom Markvart, University of Southampton, UK*

"[T]his is a comprehensive guide to the mechanisms behind current solar technology as well as the physical, interpretable, and quantitative descriptions of how these technologies operate. The book is very clearly written and should be accessible and attractive to most students. Recommended." --*CHOICE*

"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 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 for stimulating review lessons." --*MRS Bulletin*

"*Solar Energy* is an engaging collection of important information and insights that fills a valuable space between the growing collection of energy-themed textbooks and the more specialized treatises on renewable energy, solar engineering, and PV devices. ... *Solar Energy* should help readers understand and use the basic science and tools Mackay presents to affect the future--as scientists, engineers, and citizens. It is a timely contribution in a world where carbon emissions and PV installations continue to increase and where the renewable-energy community continues to face the challenge of coupling energy production and storage to fully utilize the power of solar energy." --*Physics Today*

About the Author

Michael E. Mackay, *Professor of Materials Science & Engineering and Chemical & Biomolecular Engineering, University of Delaware*

Michael E. Mackay received his undergraduate degree in chemical engineering with distinction from the University of Delaware, then worked for Proctor and Gamble prior to attending graduate school at the

University of Illinois (Urbana) where he received M.S. and PhD degrees in chemical engineering. He subsequently became a postdoctoral fellow at the University of Melbourne (Australia), and has had positions at the University of Queensland (Australia), Stevens Institute of Technology, Michigan State University, and is presently the distinguished Professor of Materials Science and Engineering at the University of Delaware. He is a nationally and internationally known leader in nanotechnology specializing in how nanoparticles improve polymer performance and their use in making novel devices and materials. Recently, he has focused his research efforts to make polymer-based solar cells that that can be made on any surface.

Users Review

From reader reviews:

Deborah Ayers:

Do you have favorite book? When you have, what is your favorite's book? Book is very important thing for us to know everything in the world. Each publication has different aim or even goal; it means that e-book has different type. Some people experience enjoy to spend their time for you to read a book. They can be reading whatever they consider because their hobby is definitely reading a book. How about the person who don't like reading a book? Sometime, man or woman feel need book whenever they found difficult problem or maybe exercise. Well, probably you will want this Solar Energy: An Introduction.

Tamica Harris:

What do you regarding book? It is not important together with you? Or just adding material when you require something to explain what the one you have problem? How about your time? Or are you busy particular person? If you don't have spare time to perform others business, it is gives you the sense of being bored faster. And you have free time? What did you do? All people has many questions above. They should answer that question due to the fact just their can do that will. It said that about book. Book is familiar on every person. Yes, it is appropriate. Because start from on jardín de infancia until university need this particular Solar Energy: An Introduction to read.

Minerva Garrison:

Beside this kind of Solar Energy: An Introduction in your phone, it might give you a way to get more close to the new knowledge or information. The information and the knowledge you are going to got here is fresh from oven so don't be worry if you feel like an previous people live in narrow small town. It is good thing to have Solar Energy: An Introduction because this book offers for your requirements readable information. Do you at times have book but you do not get what it's about. Oh come on, that will not happen if you have this inside your hand. The Enjoyable agreement here cannot be questionable, such as treasuring beautiful island. Techniques you still want to miss that? Find this book as well as read it from at this point!

Sharon Bradley:

What is your hobby? Have you heard which question when you got learners? We believe that that issue was given by teacher to the students. Many kinds of hobby, Everyone has different hobby. Therefore you know

that little person including reading or as studying become their hobby. You need to understand that reading is very important and book as to be the thing. Book is important thing to incorporate you knowledge, except your personal teacher or lecturer. You see good news or update about something by book. A substantial number of sorts of books that can you take to be your object. One of them is niagra Solar Energy: An Introduction.

**Download and Read Online Solar Energy: An Introduction By
Michael E. Mackay #PVL3RCWDS17**

Read Solar Energy: An Introduction By Michael E. Mackay for online ebook

Solar Energy: An Introduction By Michael E. Mackay Free PDF d0wnl0ad, audio books, books to read, good books to read, cheap books, good books, online books, books online, book reviews epub, read books online, books to read online, online library, greatbooks to read, PDF best books to read, top books to read Solar Energy: An Introduction By Michael E. Mackay books to read online.

Online Solar Energy: An Introduction By Michael E. Mackay ebook PDF download

Solar Energy: An Introduction By Michael E. Mackay Doc

Solar Energy: An Introduction By Michael E. Mackay Mobipocket

Solar Energy: An Introduction By Michael E. Mackay EPub