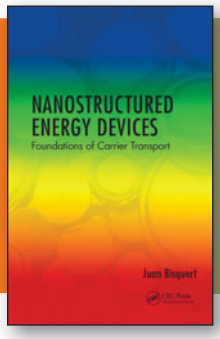
courses, the author begins with a chapter on crystal structure followed by chapters on electrons, band theory, and phonons. A chapter on quantum confinement is also included in this section, as well as a chapter on bulk and nanowire silicon, before ending with a chapter that begins with transport equations and finishes with the thermoelectric properties of specific materials that continue to be of interest as thermoelectric materials.

The text mostly takes a how-to approach throughout; the author introduces concepts that students can use in solving the examples. Many of the examples are essential for a proper understanding of the material. The exercises extend this approach and allow the student to more fully develop an understanding of the material. The figures and tables are useful.

The second part of the book does not provide much depth in any of its subjects because of its ambitious breadth. The basic features of solid-state physics are covered; however, there are a number of other excellent texts on solid-state and materials physics. It may have been best to shorten this part of the text while expanding the first part to include more derivations and examples.

This book is well written with up-to-date examples. It will be useful as a textbook for a course on thermoelectrics for advanced undergraduates and first-year graduate students in engineering. The text has been tested, as the author has taught the course several times and has compiled the material based on this experience. As someone who has been involved with research on new materials for thermoelectrics applications for more than two decades, as well as incorporated certain aspects of the field into undergraduate and graduate courses in materials physics, I found the text to be interesting. Thermoelectrics is a "field with comprehensive applications" involving "multiple interdisciplinary fields," as the author indicates.

***Reviewer: George S. Nolas**, Department of Physics, University of South Florida, USA.*



Nanostructured Energy Devices: Foundations of Carrier Transport

Juan Bisquert

CRC Press, 2017
180 pages, $179.95 (e-book $161.96)
ISBN 9781466587991

Nanostructure-based energy devices such as solar-cell devices provide a new alternative to traditional Si-based solar-cell devices. Understanding the transport processes, charge injection, and band bending in nanostructure-based energy devices is important in guiding their design and fabrication. This short book (volume II in a series) provides a concise yet adequate theoretical representation of carrier transport in nanostructured energy devices.

The book's seven chapters discuss different carrier transport models in energy devices: drift transport (chapter 1); diffusion transport (chapter 2); drift-diffusion transport (chapter 3); transport mechanisms in disordered media, such as hopping, single-level and two-level trapping, multiple trapping, and variable range hopping (chapter 4); configurations of thin-film transistors (chapter 5); space-charge-limited transport for insulator materials (chapter 6); and frequency-domain impedance spectroscopy characterization (chapter 7). Most discussions are independent of the nanomaterials in the nanostructured devices, but there are also discussions specific to organic materials, dye-sensitized solar-cell devices, and single-layer MoS_2 transistors.

This reference book should be of particular interest for researchers in related experimental fields who want to understand the theoretical framework needed for solar-cell devices. It is also a good reference for beginning researchers in device simulation and modeling. Anyone with knowledge of electrodynamics and quantum mechanics should be able to read the book without much effort. Step-by-step derivations are provided for readers. Plenty of figures, such as energy diagrams, schematics of devices, diagrams of density of states, and current–voltage (I–V) characterizations are provided throughout the book to help readers understand the theoretical narratives. At the end of each chapter, adequate and up-to-date references are listed. Overall, this book is very well written and definitely worth reading for students, researchers, and engineers in relevant fields. The unique aspect of this book is that it is short yet adequate, especially for experimentalists.

***Reviewer: Gen Long**, assistant professor of physics, St. John's University, USA.*

https://doi.org/10.1557/mrs.2018.228 Published online by Cambridge University Press