

Wiley Series in Microwave and Optical Engineering • Kai Chang, Series Editor

Solar Cells and Their Applications

SECOND EDITION

LEWIS FRAAS • LARRY PARTAIN



 WILEY

Solar Cells and Their Applications, 2nd Edition

Lewis M. Fraas, Larry D. Partain

ISBN: 978-0-470-44633-1

Hardcover

640 pages

October 2010

Hallmark Features

- Compiles work done by international pioneering experts writing on their respective fields of expertise.
- Reflects the dramatic advances in this field since the 1995 publication of the first edition.
- Provides an overview chapter allowing a wider range of readers to understand critical concepts driving the future of this rapidly evolving field.
- Uses basic physics and engineering principles, coupled with economic, market, business, investment and policy factors, to explain the current status of solar cells and their applications.

"The authors ably illustrate the rapid pace of innovation happening around the world in the pursuit of solar energy."

Richard Swanson, Founder, President and Chief Technical Officer,
SunPower Corporation

"A very nice high level treatment [of solar cell device physics] with some original insights."

Martin Green, Scientia Professor, Photovoltaics Centre of Excellence,
University of New South Wales

"This book is good look at the fundamentals of manufacturing photovoltaic cells and modules. With this understanding of the technology a reader can advance in the field and contribute to the growth of the industry."

Roger Little, Founder, CEO, President, Spire Corporation

"[The device physics chapter] is an interesting approach to photovoltaic theory taking state-of-the-art cells and interpreting them in terms of theory."

Keith Emery, Supervisor Device Performance, National Renewable
Energy Laboratory

To Order:

Prepublication

	<u>Price</u>
BarnesandNoble.com	\$112
Amazon.com	\$123
Borders.com	\$140
Wiley.com	\$140

<http://www.wiley.com/WileyCDA/WileyTitle/productCd-0470446331.html>

TABLE OF CONTENTS

I. Introduction: Solar Cells

1. Solar Cells: A Brief History and Introduction- Lewis Fraas, JX Crystals
2. Solar Cells: Markets, Market History, Public Policy, Projected Future & Estimated Costs – Larry Partain, Varian
3. Solar Cells, Single Crystal Semiconductors, and High Efficiency – Lewis Fraas, JX Crystals
4. Solar Cell Device Physics – Larry Partain, Varian

II. Terrestrial Solar Cell Electricity Today

5. Crystalline Silicon Solar Cells and Modules – Leonid Rubin, Day4Energy
6. Thin Film Solar Cells and Modules – Robert Birkmire, Univ. Delaware
7. Terrestrial Module Fabrication and Assembly Technologies - Chris Bunner, Spire Corp.
8. Chinese Solar Cell Status 2008, Wang Sicheng, Energy Research Institute, NDRC, P.R. China
9. Solar trackers – Ron Corio & Michael Reed, Array Technologies Inc, Lewis Fraas, JX Crystals Inc
10. Solar Cell Systems: Definition, Performance, & Reliability Jason Strauch, Sandia National Labs, USA
11. Leveled Cost of Energy for Utility-Scale Photovoltaics – Matthew Campbell, SunPower Corp.

III. Terrestrial Concentrator Solar Cell Systems

12. Low Concentration Crystalline Silicon Systems – Lewis Fraas, JX Crystals
13. High-Concentration, III-V Multijunction Cells– Geoffrey Kinsey, Amonix, Inc
14. High Concentration Fresnel Lens Assemblies and Systems, Gerhard Peharz, Andreas Bett, Fraunhofer Institut für Solare Energiesysteme, Germany
15. High Concentration Cassengrainian Solar Modules and Arrays, Michael Ludowise, SolFocus Inc, Lewis Fraas, JX Crystals
16. Concentrator Solar Cell Installations at UNLV, Suresh Sadineni, Robert Boehm, University of Nevada Las Vegas
17. Concentrator Solar Cell Field Installations – Francisca Rubio, Maria Martinez, and Pedro Banda, Institute of PV Concentrators, ISFOC, Spain

IV. Space

18. High Performance Space Solar Cells & Systems – Sheila Bailey and Ryne Raffaele - NASA Glenn Research Center, USA

V. Other Aspects & Considerations

19. Solar Resource for Space and Terrestrial Applications, Christian Gueymard, Solar Consulting Services, Daryl R. Myers, NREL, USA
20. Solar Energy Costs: the Solar Advisor Model, Paul Gilman & Nate Blair, NREL, Chris Cameron, Sandia National Labs
21. Challenges of Large-Scale Solar Cell Electricity Production, David Faiman, Ben-Gurion University of the Negev, Israel

VI. Thin Films & X-ray Imager Technologies

22. Flat Panel Detectors for X-Ray Imaging, Carl LaCasce, Chuck Blouir, Varian
23. Amorphous Silicon Transistors and Photodiodes, Robert A Street, Palo Alto Research Center
24. Amorphous Silicon Digital X-ray Imaging, Richard E. Colbeth, Varian
25. Photoconductor Digital X-ray imaging – George Zentai, Varian

VII. Summary

26. Summary, Conclusions, and Recommendations – Lewis Fraas, JX Crystals & Larry Partain, Varian