

Contents

Series Preface	ix
Preface	xi
Editor	xiii
Contributors	xv

PART VI Laser Diodes

26 Laser Diode Fundamentals	3
<i>Joachim Piprek</i>	
27 High-Power Lasers	15
<i>Hans Wenzel and Anissa Zeghuzi</i>	
28 High-Brightness Tapered Lasers	59
<i>Ignacio Esquivias, Antonio Pérez-Serrano, and José-Manuel G. Tijero</i>	
29 High-Brightness Laser Diodes with External Feedback.....	81
<i>Mohamad Anas Helal, Simeon N. Kaunga-Nyirenda, Steve Bull, and Eric Larkins</i>	
30 Single Longitudinal Mode Laser Diodes	109
<i>Xun Li</i>	
31 Traveling Wave Modeling of Nonlinear Dynamics in Multisection Laser Diodes ...	153
<i>Mindaugas Radziunas</i>	
32 Mode-Locked Semiconductor Lasers	183
<i>Eugene Avrutin and Julien Javaloyes</i>	

- 33 Quantum Cascade Lasers: Electrothermal Simulation 235
Song Mei, Yanbing Shi, Olafur Jonasson, and Irena Knezevic
- 34 Vertical-Cavity Surface-Emitting Lasers 261
Tomasz Czyszanowski, Leszek Frasunkiewicz, and Maciej Dems

PART VII Photodetectors and Modulators

- 35 Photodetector Fundamentals 283
Prasanta Basu
- 36 P-N Junction Photodiodes 307
Weida Hu
- 37 Quantum Well Infrared Photodetectors 337
Kwong-Kit Choi
- 38 Optical Modulators 363
Dominic F.G. Gallagher and Dmitry Labukhin

PART VIII Solar Cells

- 39 Solar Cell Fundamentals 383
Matthias Müller
- 40 Multijunction Solar Cells 415
Matthew Wilkins and Karin Hinzer
- 41 Nanostructure Solar Cells 441
Urs Aeberhard
- 42 Nanowire Solar Cells: Electro-Optical Performance 475
Bernd Witzigmann
- 43 Thin-Film Solar Cells 497
Matthias Auf der Maur, Tim Albes, and Alessio Gagliardi

PART IX Novel Applications

- 44 Electroluminescent Refrigerators 541
Kuan-Chen Lee and Shun-Tung Yen
- 45 Photonic Crystal Laser Diodes 561
Maciej Dems
- 46 Single-Photon Sources 585
Niels Gregersen, Dara P. S. McCutcheon, and Jesper Mørk
- 47 Nanoplasmonic Lasers and Spasers 609
A. Freddie Page and Ortwin Hess
- 48 Quantum-Dot Nanolasers 627
Christopher Gies, Michael Lorke, Frank Jahnke, and Weng W. Chow
- 49 Nonlinear Dynamics in Quantum Photonic Structures 661
Gabriela Slavcheva and Mirella Koleva

PART X Mathematical Methods

- 50 Drift-Diffusion Models 733
Patricio Farrell, Nella Rotundo, Duy Hai Doan, Markus Kantner, Jürgen Fuhrmann, and Thomas Koprucki
- 51 Monte Carlo Device Simulations 773
Katerina Raleva, Abdul R. Shaik, Raghuraj Hathwar, Akash Laturia, Suleman S. Qazi, Robin Daugherty, Dragica Vasileska, and Stephen M. Goodnick
- 52 Photonics 807
Frank Schmidt
- Index** 853