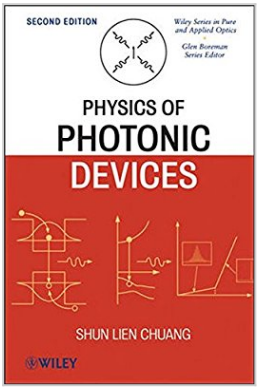

Physics of Photonic Devices

By Shun Lien Chuang

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The most up-to-date book available on the physics of photonic devices

This new edition of Physics of Photonic Devices incorporates significant advancements in the field of photonics that have occurred since publication of the first edition (Physics of Optoelectronic Devices). New topics covered include a brief history of the invention of semiconductor lasers, the Lorentz dipole method and metal plasmas, matrix optics, surface plasma waveguides, optical ring resonators, integrated electroabsorption modulator-lasers, and solar cells. It also introduces exciting new fields of research such as: surface plasmonics and micro-ring resonators; the theory of optical gain and absorption in quantum dots and quantum wires and their applications in semiconductor lasers; and novel microcavity and photonic crystal lasers, quantum-cascade lasers, and GaN blue-green lasers within the context of advanced semiconductor lasers.

Physics of Photonic Devices, Second Edition presents novel information that is not yet available in book form elsewhere. Many problem sets have been updated, the answers to which are available in an all-new Solutions Manual for instructors. Comprehensive, timely, and practical, Physics of Photonic Devices is an invaluable textbook for advanced undergraduate and graduate courses in photonics and an indispensable tool for researchers working in this rapidly growing field.

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Editorial Review

From the Publisher
Emphasizes the theory of semiconductor optoelectronic devices, demonstrating comparisons between theoretical and experimental results. Presents such important topics as semiconductor heterojunctions and band structure calculations near the band edges for bulk and quantum-well semiconductors. Details semiconductor lasers including double-heterostructure, stripe-geometry gain-guided semiconductor, distributed feedback and surface-emitting. Systematically investigates high-speed modulation of semiconductor lasers using linear and nonlinear gains. Features new subjects such as the theories on the band structures of strained semiconductors and strained quantum-well lasers. Covers key areas behind the operation of semiconductor lasers, modulators and photodetectors.

From the Back Cover

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About the Author

Shun Lien Chuang, PhD, is the MacClinchie Distinguished Professor in the Department of Electrical and Computer Engineering at the University of Illinois, Urbana-Champaign. His research centers on semiconductor optoelectronic and nanophotonic devices. He is a Fellow of the American Physical Society, IEEE, and the Optical Society of America. He received the Engineering Excellence Award from the OSA, the Distinguished Lecturer Award and the William Streifer Scientific Achievement Award from the IEEE Lasers and Electro-Optics Society, and the Humboldt Research Award for Senior U.S. Scientists from the Alexander von Humboldt Foundation.

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