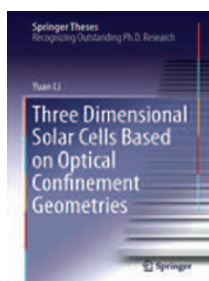


# New titles at a glance

## Three Dimensional Solar Cells Based on Optical Confinement Geometries

by Yuan Li

SPRINGER. 153PP. £90



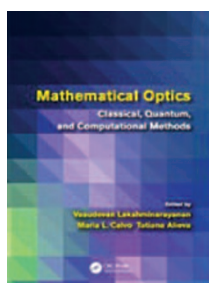
This book summarizes the progress that has been made in designing and constructing three-dimensional solar cells, which have gained popularity owing to their excellent light-collection capabilities

and high efficiency. The text describes how analytical tools such as equivalent circuit models, ray-tracing optics and absorber spectral response can be used to assess a cell's key parameters, such as its short-circuit current, open-circuit voltage, fill factor and external quantum efficiency. Three-dimensional solar cells that exploit fibre bundles, tandem designs, dye-sensitized tubes and zinc oxide nanorods are discussed.

## Mathematical Optics: Classical, Quantum, and Computational Methods

edited by Vasudevan Lakshminarayanan, María Calvo and Tatiana Alieva

CRC PRESS. 630PP. £95



Organized into six parts, this reference book presents state-of-the-art mathematical methods that have great relevance and applications in classical optics, quantum optics and image processing.

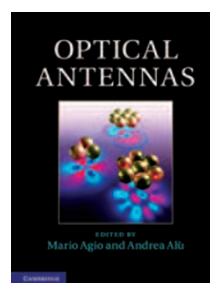
Part I describes the use of phase-space concepts to characterize optical beams and the application of dynamic programming in optical waveguides. Part II explores solutions to paraxial, linear and nonlinear wave equations. Part III discusses computational plasmonics and cutting-edge areas in transformation optics, such as invisibility cloaks. Part IV uses Lorentz groups, dihedral group symmetry, Lie algebras and Liouville space to analyse problems in polarization, ray optics,

visual optics and quantum optics. Part V examines the role of coherence functions in modern laser physics and explains how to apply quantum memory channel models in quantum computers. Part VI introduces super-resolution imaging and differential geometric methods in image processing.

## Optical Antennas

edited by Mario Agio and Andrea Alù

CAMBRIDGE UNIVERSITY PRESS. 480PP. US\$135



This book brings together leading experts in the fields of electrical engineering, nanophotonics, physical chemistry and nanofabrication to present a systematic review of recent

advances in optical antenna theory and experimentation. Fundamental concepts and functionalities relevant to optical antennas are explained, together with key principles for optical antenna modelling, design and characterization. Practical applications that aim to exploit the potential of optical antenna technology are also outlined. By presenting a translation of the concepts of radio antenna design, near-field optics and field-enhanced spectroscopy, this interdisciplinary book will prove to be a useful resource for researchers and graduate students in engineering, optics and photonics, physics and chemistry.

## Emerging Imaging Technologies in Medicine

edited by Mark A. Anastasio and Patrick J. La Riviere

CRC PRESS. 361PP. £108



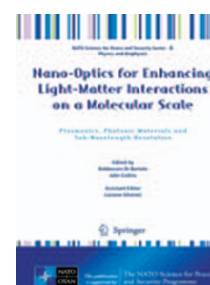
This book discusses a number of emerging technologies that offer promising clinical applications in the near- (less than five years), mid- (five to ten years) and long-term (more than ten years).

Each chapter provides a detailed discussion of the physics behind each technology, addresses improvements in terms of dose, sensitivity and specificity, and comments on the limitations of current imaging approaches. Topics covered include tomosynthesis, breast computer tomography, spectral computer tomography, X-ray phase-contrast imaging, photoacoustic imaging, diffuse optical tomography and acoustic imaging. Multimodal approaches that combine several imaging technologies to provide additional information are also described, such as positron emission tomography/magnetic resonance imaging (MRI), diffuse optical tomography/MRI, and photoacoustic tomography/diffuse optical tomography. Three-dimensional microscopy technologies such as photoacoustic microscopy, optical coherence tomography and Fourier transform infrared spectroscopy are also discussed.

## Nano-Optics for Enhancing Light-Matter Interactions on a Molecular Scale

edited by Baldassare Di Bartolo and John Collins

SPRINGER. 477PP. £153



Divided into 60 chapters, this text discusses the opportunities and capabilities for controlling matter and electromagnetic fields on a subwavelength scale. Covered topics range from fundamental

scientific phenomena, including photonic metamaterials, plasmonics and subwavelength resolution, to applications such as the detection of single molecules, tomography on a microchip, fluorescence spectroscopy of biological systems, coherent control of biomolecules, biosensing of single proteins, and terahertz spectroscopy of nanoparticles. Emphasis is put not only on describing the principles behind each technique, but also on examining their capabilities and potential. The contributions in this volume are based on presentations given at a NATO Advanced Study Institute on 3–18 July 2011 in Erice, Italy.