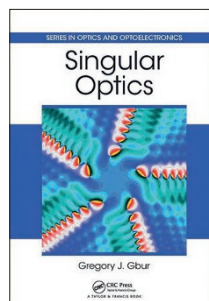


New titles at a glance

Singular Optics

By Gregory J. Gbur

CRC PRESS 545PP. £82.00



In the preface, the author writes that “we will see that the behavior of a light wave is just as much defined by what happens in the empty spaces as it is by what happens in the bright spots.” This statement sets the scene for

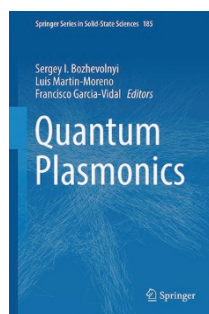
the subject of this text, namely the study of regions of an electromagnetic wave field where the intensity is zero and the phase is therefore indeterminate — that is, singular. Zero-intensity regions of a light field are commonly referred to as optical vortices, and the study of their properties is as important as the investigation of their potential applications. Starting with the introduction of Laguerre–Gauss beams, wave dislocations and topological charges, the title discusses the generation and detection of optical vortices as well as applications in areas including micromanipulation and communications. As the singularities of wave fields can take on many forms, the author also highlights polarization and coherence singularities, and vortices in quantum optics and in random fields.

Quantum Plasmonics

Edited by Sergey I. Bozhevolnyi,

Luis Martin-Moreno and Francisco Garcia-Vidal

SPRINGER 327PP. £112.00



This book was inspired by a workshop organized by the editors at the ‘Centro de Ciencias’ in Benasque, Spain in 2015, and aims at reporting the progress achieved in different branches of the field known as quantum plasmonics,

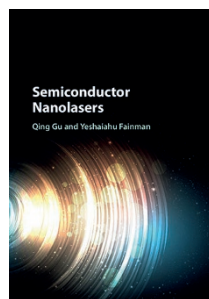
which indeed lies at the border of quantum optics and nanophotonics of metal structures. As the latter two areas have individually reached a certain level of maturity, it is

now interesting to investigate quantum effects arising from the interaction between plasmons and quantum systems such as molecules, single nitrogen–vacancy centres and quantum dots. Individual chapters contributed by research groups active in quantum plasmonics cover hyperbolic metamaterials for single-photon sources and nanolasers, polariton condensation, surface plasmon-enhanced Schottky detectors as well as non-local effects in metamaterials and metal nanostructures.

Semiconductor Nanolasers

By Qing Gu and Yeshiaahu Fainman

CAMBRIDGE UNIV. PRESS 436PP. £99.99



This text, written by two experts working in this technologically challenging area of photonics, provides insights into the design, fabrication and characterization of semiconductor nanolaser systems. Following an introductory chapter

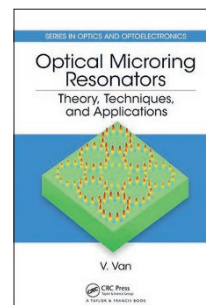
that reviews the fundamental limits on the size of a laser as well as the characteristics of several nanolaser types, the authors discuss the evaluation of the Purcell effect in a semiconductor nanolaser and present a variety of design options ranging from antenna-inspired nano-patch lasers to electrically pumped systems and cavity-free nanolasers. Photonic integrated circuits and high-speed optical communications feature as two relevant applications for nanolasers, and the book concludes with appendices covering specific technical aspects such as temperature-dependent gain and the modelling of thermal effects. The text is aimed at a broad readership that includes graduate students as well as professionals in photonics, optoelectronics and nanotechnology.

Optical Microring Resonators

By V. Van

CRC PRESS 287PP. £99.00

Optical microring resonators are a well-established technology, and the advances in integrated optics and microfabrication have led to improved designs and performance



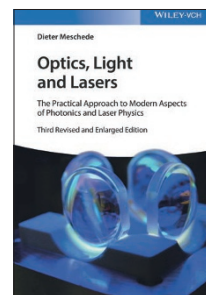
for these devices. As noted by the author in the preface, microring resonators are simple yet versatile structures: this explains their successful application to nonlinear optics, optomechanics, sensors and lasers.

The text is intended to provide graduate students and more experienced researchers with the necessary knowledge to design microring resonators suited to their scientific needs, hence the author covers the theoretical principles of operation of these devices as well as some relevant applications. The first two chapters present the constitutive elements of a microring resonator and the analytical models describing these systems. Further chapters include topics such as coupled microring optical filters, all-optical switching and the dynamic response of a microring modulator.

Optics, Light and Lasers

By Dieter Meschede

WILEY 576PP. £75.00



Since its first edition, the aim of this book has been to link the fundamentals of optics to recent research developments. In this view, the present edition is updated and expanded to cover topics such as microscopy

beyond the resolution limit, metamaterials, femtosecond laser frequency combs and quantum cascade lasers. The text is also a valuable reference on the basics of nonlinear and quantum optics. A non-exhaustive list of featured subjects includes light propagation in matter (as well as in optical fibres), laser dynamics, optical detectors, laser spectroscopy and laser cooling, quantum properties of light fields and optical mixing processes. As mentioned in the preface, graphical educational material is made available by the author through a bespoke website.