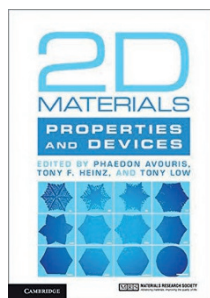


New titles at a glance

2D Materials

Edited by Phaedon Avouris, Tony F. Heinz and Tony Low
CAMBRIDGE UNIV. PRESS 232PP. £79.99

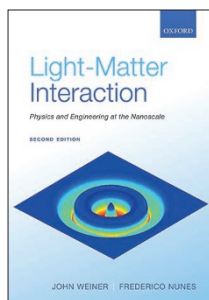


This text provides all the necessary background in materials science and physics to discuss the fundamental properties of a wide range of 2D materials, as well as reviewing their potential applications in

electronic, optoelectronic and photonic devices. Several important classes of materials are covered, from the more established ones, such as graphene, hexagonal boron nitride and transition metal dichalcogenides, to new and emerging materials, such as black phosphorus, silicene and germanene. Written for graduate students, researchers and practitioners working in nanotechnology, nanoelectronics, nanophotonics, condensed-matter physics and chemistry, this book gives an in-depth understanding of the electronic structure and optical, thermal, mechanical, vibrational, spin and plasmonic properties of each material. Furthermore, the different techniques that can be used for their synthesis are featured.

Light-Matter Interaction

By John Weiner and Frederico Nunes
OXFORD UNIV. PRESS 432PP. £52.50



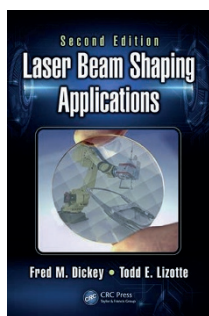
Light-matter interaction is ubiquitous throughout the disciplines of optical and atomic physics, condensed-matter physics, and electrical engineering, and now increasingly in biology and medicine with frequency and

length scales extending over many orders of magnitude. This book provides the principal tools needed to understand and contribute to rapidly advancing developments in the light-matter interaction. It is written for advanced students and researchers in

diverse disciplines, working with optical frequencies and length scales from a few hundred nanometres to a few hundredths of a nanometre. Featuring fundamental as well as more advanced chapters, the book covers topics such as the physical optics of plane waves, dipole antenna, blackbody radiation, transmission lines and waveguides, and atom radiation in classical and quantum atoms, to name a few. Several new and extended chapters discuss metamaterials, momentum flow between light fields and matter, and atom-optical forces applied to atomic and molecular cooling and trapping.

Laser Beam Shaping Applications

By Fred M. Dickey and Todd E. Lizotte
CRC PRESS 430PP. £155.00



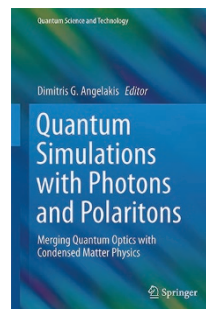
This resource broadly covers real-world laser-beam-shaping applications. It details the important features of beam shaping and reveals the subtleties of the theory and the techniques through applications.

In this second edition, new chapters cover illumination light shaping in optical lithography, optical micro-manipulation of live mammalian cells through trapping, sorting and transfection, and laser beam shaping through fibre-optic beam delivery. Other applications also discussed are lithography, laser printing, optical data storage, stable isotope separation and spatially dispersive lasers.

Quantum Simulations with Photons and Polaritons

Edited by Dimitris G. Angelakis
SPRINGER 214PP. £72.50

Quantum simulators are specially designed quantum computers to simulate and understand complex and inaccessible quantum many-body phenomena found or predicted in condensed-matter physics, materials science and exotic quantum field theories. Technological developments in the fields of interfacing light and matter, especially in many-body quantum optics, have motivated recent proposals for quantum simulators



based on strongly correlated photons and polaritons generated in hybrid light-matter systems. This book reviews progress towards quantum simulators based on photonic and hybrid light-matter systems, covering theoretical

proposals and recent experimental work on quantum technology platforms based on coupled microwave resonator arrays in superconducting circuits, semiconductor-based polariton systems and integrated quantum photonic chips. It also covers some of the most important works in this area, such as the proposal of Mott transitions and Luttinger liquid physics with light, simulation of relativistic theories, topological insulators and gauge field physics.

Deep Imaging in Tissue and Biomedical Materials

Edited by Lingyan Shi and Robert Alfano
PAN STANFORD 524PP. £159.00



The use of light for probing and imaging biomedical media is promising for the development of safe, non-invasive and inexpensive clinical imaging modalities with diagnostic ability. The advent of ultrafast lasers has enabled applications

of nonlinear optical processes, which allow deeper imaging in biological tissues with higher spatial resolution. This book provides an overview of emerging novel optical imaging techniques. It features pioneering works that employ linear and nonlinear optical imaging techniques for deep tissue imaging, which include the new applications of single- and multi-photon excitation fluorescence, Raman scattering, coherent anti-Stokes Raman spectroscopy, and near-infrared and mid-infrared supercontinuum spectroscopy. It also covers how spatial information can be improved by using the near-infrared optical windows where scattering is reduced for deep imaging.