
Introduction To Graphene Plasmonics An

Nanoplasmonics
Graphene
Reviews in Plasmonics 2017
From Classical to Quantum Plasmonics in Three and Two Dimensions
Plasmonics and Electron Optics in Graphene
Modern Introduction to Surface Plasmons
Nanoscience And Technology: A Collection Of Reviews From Nature Journals
Graphene Photonics
Graphene Photonics, Optoelectronics, and Plasmonics
Plasmonics-Based Optical Sensors and Detectors
Graphene and Its Derivatives
Graphene-Based Terahertz Electronics and Plasmonics
Surface Plasmon Nanophotonics
Light-Emitting Diodes and Photodetectors
Magneto-Plasmonics and Optical Activity in Graphene-Based Nanowires
An Introduction to Graphene Plasmonics
Graphene Nanoelectronics
Introduction to Plasmonics
An Introduction To Graphene Plasmonics
Plasmon-enhanced light-matter interactions
Towards Infrared Plasmonics in Graphene
The Physics of Graphene
Handbook of Graphene, Volume 2
Hyperbolic Metamaterials
Plasmonics and Light-Matter Interactions in Two-Dimensional Materials and in Metal Nanostructures
Canonical Problems in the Theory of Plasmonics
Recent Advances in Graphene Nanophotonics
Handbook of Graphene
Introduction to Graphene-Based Nanomaterials
Exploring Flatland Nano-optics with Graphene Plasmons
Introduction to Nanophotonics
Introduction to Graphene
Introduction to Graphene-Based Nanomaterials
Graphene Photonics, Optoelectronics, and Plasmonics
Graphene-Based Terahertz Electronics and Plasmonics
2D Materials
2D Materials for Surface Plasmon Resonance-based Sensors
World Scientific Handbook Of Metamaterials And Plasmonics (In 4 Volumes)

HAILIE ELVIS

Nanoplasmonics Springer

Graphene has been hailed as a rising star in photonics and optoelectronics. The wonderful optical properties of graphene make possible the multiple functions of signal emission, transmission, modulation, and detection to be realized in one material. This book compiles and details cutting-edge research in graphene photonics, plasmonics, and broadband optoelectronic devices. Particularly, it emphasizes the ability to integrate graphene photonics onto the silicon platform to afford broadband operation in light routing and amplification, which involves components such as the polarizer, the modulator, and the photodetector. It also includes other functions such as a saturable absorber and an optical limiter. The book provides a comprehensive overview of the interrelationship between the operation of these conceptually new photonic devices and the fundamental physics of graphene involved in the interactions between graphene and light.

Graphene Oxford University Press

2D Materials for Surface Plasmon Resonance-based Sensors offers comprehensive coverage of recent design and development (including processing and fabrication) of 2D materials in the context of plasmonic-based devices. It provides a thorough overview of the basic principles and techniques used in the analysis and design of 2D material-based optical sensor systems. Beginning with the basic concepts of plasmon/plasmonic sensors and mathematical modelling, the authors explain the fundamental properties of 2D materials, including Black Phosphorus (BP), Phosphorene, Graphene, Transition metal dichalcogenides (TMDCs), MXene's and SW-CNT. It also details the applications of these emerging materials in clinical diagnosis and their future trends. This text will be useful for practising engineers, undergraduate and postgraduate students. Key Features Presents the fundamental concepts of 2D material assisted fibre optic and prism based SPR sensor in a student-friendly manner. Includes

the recent synthesis and characterization techniques of 2D materials. Provides computational results of recently discovered electronic and optical properties of the 2D materials along with their effectiveness in the field of plasmonic sensors. Presents emerging applications of novel 2D material-based plasmonic sensors in the field of chemical, bio-chemical and biosensing.

Reviews in Plasmonics 2017 World Scientific

The second volume in a series of handbooks on graphene research and applications Graphene is a valuable nanomaterial used in technology. This handbook features graphene topics related to Physics, Chemistry, and Biology. The Handbook of Graphene, Volume 2 delivers an overview on the numerous and diverse graphene research directions and innovations. The handbook covers a range of areas including graphene in optoelectronic devices and as a detector of biomolecules. From Classical to Quantum Plasmonics in Three and Two Dimensions CRC Press

Metamaterials represent a new emerging innovative field of research which has shown rapid acceleration over the last couple of years. In this handbook, we present the richness of the field of metamaterials in its widest sense, describing artificial media with sub-wavelength structure for control over wave propagation in four volumes. Volume 1 focuses on the fundamentals of electromagnetic metamaterials in all their richness, including metasurfaces and hyperbolic metamaterials. Volume 2 widens the picture to include elastic, acoustic, and seismic systems, whereas Volume 3 presents nonlinear and active photonic metamaterials. Finally, Volume 4 includes recent progress in the field of nanoplasmonics, used extensively for the tailoring of the unit cell response of photonic metamaterials. In its totality, we hope that this handbook will be useful for a wide spectrum of readers, from students to active researchers in industry, as well as teachers of advanced courses on wave propagation.

Plasmonics and Electron Optics in Graphene CRC Press

This book is meant as an introduction to graphene plasmonics and aims at the advanced undergraduate and graduate students entering the field of plasmonics in graphene. In it different theoretical methods are introduced, starting with an elementary

description of graphene plasmonics and evolving towards more advanced topics. This book is essentially self-contained and brings together a number of different topics about the field that are scattered in the vast literature. The text is composed of eleven chapters and of a set of detailed appendices. It can be read in two different ways: Reading only the chapters to get acquainted with the field of plasmonics in graphene or reading the chapters and studying the appendices to get a working knowledge of the topic. The study of the material in this book will bring the students to the forefront of the research in this field.

Modern Introduction to Surface Plasmons CRC Press

This thesis provides a comprehensive introduction to two active research directions within the field of plasmonics: (i) nonclassical, or quantum, aspects of the plasmonic response; and (ii) two-dimensional plasmonics, a recent innovation in the field stimulated by the advent of two-dimensional materials. It discusses the fundamentals of this field in detail, and explores several current research directions. Nonclassical plasmonics has been spurred on in recent years by the tremendous technological progress in nanofabrication and optical characterization; today, it is possible to investigate the plasmonic features of nanostructures with characteristic features in the few nanometer range. The book describes and analyzes the breakdown of the classical theory under these conditions and explores several alternatives and extensions. The unique electronic and dimensional features of novel two-dimensional materials, such as graphene, lie at the core of plasmonics' most rapidly developing subfield; two-dimensional plasmonics. This thesis provides a clear and comprehensive exposition of the central features for interested researchers looking for an entry point to this riveting area.

Nanoscience And Technology: A Collection Of Reviews From Nature Journals Springer Nature

Nanoplasmonics is a young topic of research, which is part of nanophotonics and nano-optics. Nanoplasmonics concerns to the investigation of electron oscillations in metallic nanostructures and nanoparticles. Surface plasmons have optical properties, which are very interesting. For instance, surface plasmons have

the unique capacity to confine light at the nanoscale. Moreover, surface plasmons are very sensitive to the surrounding medium and the properties of the materials on which they propagate. In addition to the above, the surface plasmon resonances can be controlled by adjusting the size, shape, periodicity, and materials' nature. All these optical properties can enable a great number of applications, such as biosensors, optical modulators, photodetectors, and photovoltaic devices. This book is intended for a broad audience and provides an overview of some of the fundamental knowledges and applications of nanoplasmonics.

Graphene Photonics John Wiley & Sons

Beginning with an introduction to carbon-based nanomaterials, their electronic properties, and general concepts in quantum transport, this detailed primer describes the most effective theoretical and computational methods and tools for simulating the electronic structure and transport properties of graphene-based systems. Transport concepts are clearly presented through simple models, enabling comparison with analytical treatments, and multiscale quantum transport methodologies are introduced and developed in a straightforward way, demonstrating a range of methods for tackling the modelling of defects and impurities in more complex graphene-based materials. The authors also discuss the practical applications of this revolutionary nanomaterial, contemporary challenges in theory and simulation, and long-term perspectives. Containing numerous problems for solution, real-life examples of current research, and accompanied online by further exercises, solutions and computational codes, this is the perfect introductory resource for graduate students and researchers in nanoscience and nanotechnology, condensed matter physics, materials science and nanoelectronics.

Graphene Photonics, Optoelectronics, and Plasmonics Springer Nature

The field of plasmonics has been attracting wide interest because it has provided routes to guide and localize light at nanoscales by utilizing metals as its major building block. Meanwhile, graphene, a two-dimensional lattice of carbon atoms, has been regarded as an ideal material for electronic applications owing to its remarkably high carrier mobility and superior thermal properties. Both research fields have been growing rapidly, but quite independently. However, a closer look reveals that there are actually numerous similarities between them, and it is possible to

extract useful applications from these analogies. Even more interestingly, these research fields are recently overlapping to create a new field of research, namely graphene plasmonics. In this thesis, we present a few examples of these intertwined topics. First, we investigate "rainbow trapping" structures, broadband plasmonic slow light systems composed of single or double negative materials. We clarify the mode-conversion mechanism and the light-trapping performance by analyzing the dispersion relation. We then show that electrons in graphene exhibit photonlike dynamics including Goos-Hanchen effect and the rainbow trapping effect, but quantitatively differently. To study the dynamics of graphene electrons numerically, we develop a finite-difference time domain simulator. We also present a way to enhance electron backscattering in graphene by engineering the dispersion of electron eigenmodes in a Kronig-Penney potential. Finally, we discuss physics of graphene plasmon cavities. We report the resonant mid-infrared transmission across a plasmonic waveguide gap that is governed by the Fano interference between transmission through plasmon modes in graphene and nonresonant background transmission. An ultracompact graphene plasmon cavity, which resonates at near-infrared telecommunication frequencies, is also proposed.

Plasmonics-Based Optical Sensors and Detectors BoD - Books on Demand

Graphene is a perfectly two-dimensional single-atom thin membrane with zero bandgap. It has attracted huge attention due to its linear dispersion around the Dirac point, excellent transport properties, novel magnetic characteristics, and low spin-orbit coupling. Graphene and its nanostructures may have potential applications in spintronics, photonics, plasmonics and electronics. This book brings together a team of experts to provide an overview of the most advanced topics in theory, experiments, spectroscopy and applications of graphene and its nanostructures. It covers the state-of-the-art in tutorial-like and review-like manner to make the book useful not only to experts, but also newcomers and graduate students.

Graphene and Its Derivatives Cambridge University Press

This book provides a detailed overview of the most recent advances in the fascinating world of light-emitting diodes (LEDs), organic light-emitting diodes (OLEDs), and photodetectors (PDs). Chapters in Section 1 discuss the different types and designs of

LEDs/OLEDs and their use in light output, color rendering, and more. Chapters in Section 2 examine innovative structures, emerging materials, and physical effects of PDs. This book is a useful resource for students and scientists working in the field of photonics and advanced technologies.

Graphene-Based Terahertz Electronics and Plasmonics

Cambridge University Press

"This book is meant as an introduction to graphene plasmonics and aims at the advanced undergraduate and graduate students entering the field of plasmonics in graphene. In it different theoretical methods are introduced, starting with an elementary description of graphene plasmonics and evolving towards more advanced topics. This book is essentially self-contained and brings together a number of different topics about the field that are scattered in the vast literature. The text is composed of eleven chapters and of a set of detailed appendices. It can be read in two different ways: Reading only the chapters to get acquainted with the field of plasmonics in graphene or reading the chapters and studying the appendices to get a working knowledge of the topic. The study of the material in this book will bring the students to the forefront of the research in this field."-- Provided by publisher.

Surface Plasmon Nanophotonics OUP Oxford

There are growing advantages to the use of graphene-based nanophotonics in communication, sensing, security, safety, spectroscopy, manufacturing, biomedicine, agriculture, imaging, and other fields. These advantages, as well as the numerous challenges associated with this technology and proposed solutions to these challenges, are summarized in this book. The key objective of the book is to serve as a single-source reference for the rapidly expanding application aspects of the technology of graphene-based nanophotonics, as well as the number of modules required for their successful implementation. This book seeks to give readers a comprehensive understanding of several elements of graphene-based nanophotonics, such as emerging application areas, the design and modelling of sensors, absorbers, optical fiber, encoders, etc. A complete view of the progress and breakthroughs in novel materials for sensing, detecting and encoding technology is presented. The book also emphasizes the consequences of THz signals on human health, as well as the environmental components of THz. This book will be of

tremendous value for those with an interest in electronic engineering, particularly those keeping an eye on this emerging technology.

Light-Emitting Diodes and Photodetectors BoD – Books on Demand

Often described as a "miracle material", graphene's potential applications are extraordinary, ranging from nanoscale 'green' technologies, to sensors and future conductive coatings. This book covers the topic of 'graphene' – the history, fundamental properties, methods of production and applications of this exciting new material. The style of the book is both scientific and technical – it is accessible to an audience that has a general, undergraduate-level background in the sciences or engineering, and is aimed at industries considering graphene applications. As the graphene topic is a broad-reaching and rapidly moving field of research, the aim of this book is therefore to provide information about graphene and its current and future applications that are immediately implementable, relevant and concise. After reading this book, the reader will have sufficient knowledge and background to move forward independently into graphene R&D and to apply the knowledge therein. Although the book will be self-contained, each chapter has copious references to enable further reading, research and exploration of the chapter topics.

Magneto-Plasmonics and Optical Activity in Graphene-Based Nanowires CRC Press

Leading graphene research theorist Mikhail I. Katsnelson systematically presents the basic concepts of graphene physics in this fully revised second edition. The author illustrates and explains basic concepts such as Berry phase, scaling, Zitterbewegung, Kubo, Landauer and Mori formalisms in quantum kinetics, chirality, plasmons, commensurate-incommensurate transitions and many others. Open issues and unsolved problems introduce the reader to the latest developments in the field. New achievements and topics presented include the basic concepts of Van der Waals heterostructures, many-body physics of graphene, electronic optics of Dirac electrons, hydrodynamics of electron liquid and the mechanical properties of one atom-thick membranes. Building on an undergraduate-level knowledge of quantum and statistical physics and solid-state theory, this is an important graduate textbook for students in nanoscience, nanotechnology and condensed matter. For physicists and

material scientists working in related areas, this is an excellent introduction to the fast-growing field of graphene science.

An Introduction to Graphene Plasmonics Cambridge University Press

The second volume in a series of handbooks on graphene research and applications Graphene is a valuable nanomaterial used in technology. This handbook features graphene topics related to Physics, Chemistry, and Biology. The Handbook of Graphene, Volume 2 delivers an overview on the numerous and diverse graphene research directions and innovations. The handbook covers a range of areas including graphene in optoelectronic devices and as a detector of biomolecules.

Graphene Nanoelectronics BoD – Books on Demand

"Graphene has been hailed as a rising star in photonics and optoelectronics. The wonderful optical properties of graphene make possible the multiple functions of signal emission, transmission, modulation, and detection to be realized in one material. This book compiles and details cutting-edge research in graphene photonics, plasmonics, and broadband optoelectronic devices. Particularly, it emphasizes the ability to integrate graphene photonics onto the silicon platform to afford broadband operation in light routing and amplification, which involves components such as the polarizer, the modulator, and the photodetector. It also includes other functions such as a saturable absorber and an optical limiter. The book provides a comprehensive overview of the interrelationship between the operation of these conceptually new photonic devices and the fundamental physics of graphene involved in the interactions between graphene and light."--Provided by publisher.

Introduction to Plasmonics Springer Science & Business Media
Nowadays, graphene plasmonics shows a great number of features unusual for traditional (metal-based) plasmonics from high localization and large propagation distance of surface plasmon-polaritons (SPPs) through the existence of both TE- and TM-polarized SPPs to the possibility of controlled SPPs by graphene chemical potential (or, equivalently, by gate voltage or chemical doping). Cylindrical graphene-based plasmonic structures have some advantages in contrast to planar geometry: absence of edge losses, existence of high-order azimuthal modes, et cetera In this work, we discuss some ways to obtain an optical

activity in cylindrical graphene-based plasmonic structures and its possible applications to SPPs manipulation.

An Introduction To Graphene Plasmonics Springer Nature

Graphene plasmons have recently been proposed as an alternative to noble-metal plasmons in the field of photonics, due to its extremely tight light confinement, relatively long-lived collective oscillation, and high tunability via electrostatic gating. Successful support and tuning of graphene plasmonic modes rely on controllable doping of graphene to high carrier densities in nanometer-scale structures. In this thesis, an experimental approach to generating nanoscale spatial carrier density modulation of graphene using electrolyte gates and crosslinked-PMMA screen is proposed and investigated. The increased optical absorption in the infrared region due to plasmon resonances induced by the proposed scheme is numerically studied. We then present the fabrication technique of the proposed scheme for various nanostructure geometries. Finally, we provide an outlook of future studies of graphene plasmonics, including plasmon excitation with solid-state cavity quantum electrodynamics (QED).
Plasmon-enhanced light-matter interactions Cambridge University Press

Fundamentals of Photonics A complete, thoroughly updated, full-color third edition Fundamentals of Photonics, Third Edition is a self-contained and up-to-date introductory-level textbook that thoroughly surveys this rapidly expanding area of engineering and applied physics. Featuring a blend of theory and applications, coverage includes detailed accounts of the primary theories of light, including ray optics, wave optics, electromagnetic optics, and photon optics, as well as the interaction of light and matter. Presented at increasing levels of complexity, preliminary sections build toward more advanced topics, such as Fourier optics and holography, photonic-crystal optics, guided-wave and fiber optics, LEDs and lasers, acousto-optic and electro-optic devices, nonlinear optical devices, ultrafast optics, optical interconnects and switches, and optical fiber communications. The third edition features an entirely new chapter on the optics of metals and plasmonic devices. Each chapter contains highlighted equations, exercises, problems, summaries, and selected reading lists. Examples of real systems are included to emphasize the concepts governing applications of current interest. Each of the twenty-four chapters of the second edition has been thoroughly updated.