

The Fascinating World of Chiral Optical Properties Of Plasmonic Systems

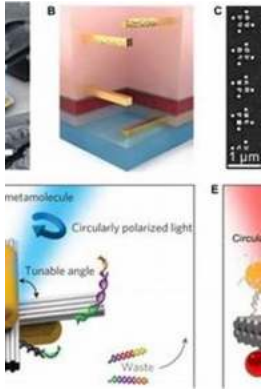
Plasmonic systems have revolutionized the field of optics, enabling unprecedented control over the behavior of light at the nanoscale. These systems, which exploit the behavior of surface plasmon polaritons, have found applications in various areas such as sensing, imaging, and information processing. One particularly intriguing aspect of plasmonic systems is their chiral optical properties. In this article, we explore the concept of chirality in plasmonic systems and discuss its implications in the field of optics.

Understanding Chirality

In the world around us, chirality is a fundamental concept that describes objects that cannot be superimposed onto their mirror images. This property is prevalent in nature and plays a crucial role in various biological systems, such as the structure of DNA and the folding of proteins. In the context of plasmonic systems, chirality refers to the asymmetric response of light to the polarization and propagation direction.

The study of chirality in plasmonic systems has gained significant attention due to its potential applications in areas such as optical communication, optical trapping, and bioimaging. By harnessing the unique optical properties of chiral plasmonic systems, researchers aim to develop novel devices with enhanced performance and functionalities.

Chiral Nanophotonics: Chiral Optical Properties of Plasmonic Systems (Springer Series in Optical



Sciences Book 205)

by Mark My Words (1st ed. 2017 Edition, Kindle Edition)

★★★★★ 5 out of 5

Language : English
File size : 9591 KB
Text-to-Speech : Enabled
Enhanced typesetting : Enabled
Print length : 275 pages
Screen Reader : Supported



Exploring Plasmonic Systems

Plasmonic systems are composed of metallic nanostructures, usually made of gold or silver, which exhibit strong interaction with light at the nanoscale. These structures support the excitation of surface plasmons, collective oscillations of electrons at the metal-dielectric interface. Plasmonic systems can be designed to exhibit a wide range of optical properties, including enhanced light-matter interactions, strong field confinement, and tailored absorption and scattering characteristics.

When plasmonic systems possess chiral symmetry, they exhibit unique optical responses that depend on the polarization and propagation direction of incident light. This chiral response arises from the geometrical arrangement or asymmetry of the nanostructures. By engineering the geometry and symmetry of plasmonic systems, researchers have achieved versatile control over their chiral optical properties.

The Role of Plasmonic Chirality in Optical Sciences 205

The book "Chiral Optical Properties Of Plasmonic Systems" published in the Springer In Optical Sciences series explores in-depth the fascinating world of plasmonic chirality. Written by esteemed authors, the book presents a comprehensive overview of the various aspects of chiral plasmonic systems, including their theory, fabrication, characterization, and applications. It serves as an essential reference for researchers and practitioners in the field of optics and nanotechnology.

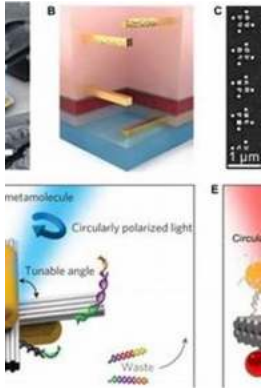
The book covers a wide range of topics, including the fundamentals of plasmonics, the role of symmetry in determining chirality, the design and fabrication of chiral plasmonic structures, and the applications of chiral plasmonic systems in areas such as sensing, spectroscopy, and optoelectronics. It also provides insights into the future prospects and challenges in the field, paving the way for further advancements in the study of chiral plasmonic systems.

The study of chiral optical properties in plasmonic systems is a rapidly evolving field with immense potential for applications in optics and beyond. By harnessing the unique optical responses of chiral plasmonic systems, researchers are unlocking new opportunities for advanced sensing, imaging, and communication technologies. The book "Chiral Optical Properties Of Plasmonic Systems" provides a comprehensive resource for understanding and exploring this exciting area of research. As we delve deeper into the world of chiral plasmonic systems, we can expect to witness groundbreaking discoveries and innovations that will shape the future of optics.

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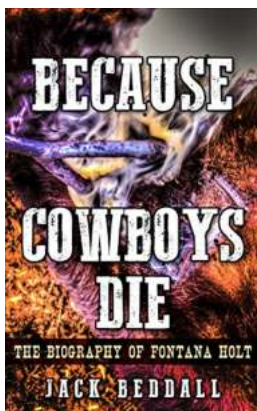
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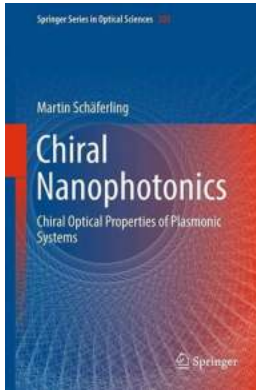


This book describes the physics behind the optical properties of plasmonic nanostructures focusing on chiral aspects. It explains in detail how the geometry determines chiral near-fields and how to tailor their shape and strength. Electromagnetic fields with strong optical chirality interact strongly with chiral molecules and, therefore, can be used for enhancing the sensitivity of chiroptical spectroscopy techniques. Besides a short review of the latest results in the field of plasmonically enhanced enantiomer discrimination, this book introduces the concept of chiral plasmonic near-field sources for enhanced chiroptical spectroscopy. The discussion of the fundamental properties of these light sources provides the theoretical basis for further optimizations and is of interest for researchers at the intersection of nano-optics, plasmonics and stereochemistry.



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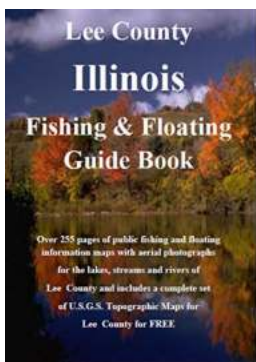
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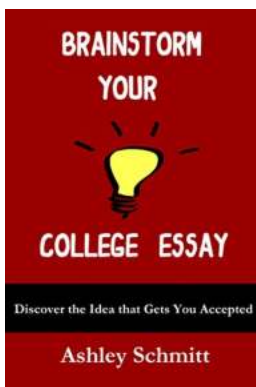
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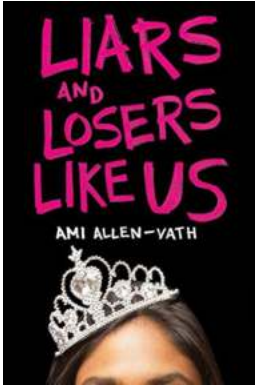
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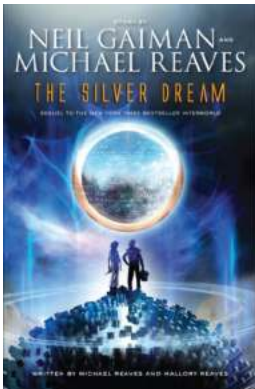
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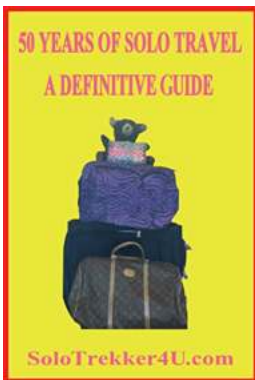
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