1. Record Nr. UNINA9910254632403321

Autore	Trugler Andreas
Titolo	Optical Properties of Metallic Nanoparticles : Basic Principles and Simulation / / by Andreas Trügler
Pubbl/distr/stampa	Cham : , : Springer International Publishing : , : Imprint : Springer, , 2016
ISBN	3-319-25074-4
Edizione	[1st ed. 2016.]
Descrizione fisica	1 online resource (227 p.)
Collana	Springer Series in Materials Science, , 0933-033X ; ; 232
Disciplina	530
Soggetti	Lasers Photonics Metals Nanoscience Nanostructures Nanotechnology Physics Optics, Lasers, Photonics, Optical Devices Metallic Materials Nanoscale Science and Technology Numerical and Computational Physics, Simulation
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Part I: Introduction and Basic principles -- Prologue -- The world of plasmons -- Theory -- Part II: Simulation: Modeling the optical response of metallic nanoparticles -- Part III: Implementations and applications.- Imaging of surface plasmons -- Influence of surface roughness -- Nonlinear optical effects of plasmonic nanoparticles -- Nonlocal response -- Metamaterials.- Outlook -- Part IV: Supplement -- Appendix - Utilities -- Appendix - MATLAB script for Mie solution.
Sommario/riassunto	This book introduces the fascinating world of plasmonics and physics at the nanoscale, with a focus on simulations and the theoretical aspects of optics and nanotechnology. A research field with numerous

applications, plasmonics bridges the gap between the micrometer length scale of light and the secrets of the nanoworld. This is achieved by binding light to charge density oscillations of metallic nanostructures, so-called surface plasmons, which allow electromagnetic radiation to be focussed down to spots as small as a few nanometers. The book is a snapshot of recent and ongoing research and at the same time outlines our present understanding of the optical properties of metallic nanoparticles, ranging from the tunability of plasmonic resonances to the ultrafast dynamics of light-matter interaction. Beginning with a gentle introduction that highlights the basics of plasmonic interactions and plasmon imaging, the author then presents a suitable theoretical framework for the description of metallic nanostructures. This model based on this framework is first solved analytically for simple systems, and subsequently through numerical simulations for more general cases where, for example, surface roughness, nonlinear and nonlocal effects or metamaterials are investigated.