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Nota di contenuto	Part 1: Lectures -- 1. Plasmonic Effects on Photonic Processes and Devices -- 2. Surface Plasmon-Mediated Decay Processes of Ions in Solids -- 3. Workshop in Computational Nanophotonics -- 4. Interaction Between a Plasmonic Nano-Resonator and a Whispering Gallery Mode Photonic Resonator Described through Coupled Mode Theory and Experiment -- 5. Time Reversal Symmetry and Topology in Electromagnetics -- 6. All-dielectric Nonlinear Meta-Optics -- 7. Nanophotonic Circuits for Unconventional Computing Applications -- 8. Terahertz Light-Matter Interactions -- 9. An Alternative Starting Point for Electromagnetism -- 10. Absorption, Emission, and Vacuum Fluctuations -- 11. Nd ³⁺ Ion as a Structural Probe in Selected Oxide Host Lattices: Coupling the Low-Temperature High-Resolution Spectroscopic Techniques with Microscopy -- 12. Efficient and Fast Scintillator Garnet Crystals: The Role of Ce ⁴⁺ in Ce ³⁺ , Mg ²⁺ -Co-Doped Gd ₃ Al ₂ Ga ₃ O ₁₂ from Spectroscopic and XANES Characterizations -- Part 2: Short Seminars -- 13. Refractive Index

Sensing by Phase Shift Cavity Ringdown Spectroscopy -- 14. Hyperpolarizability of plasmonic nanostructures: a method to quantify the SHG emission from a metasurface -- 15. Nonlinear up- and down-conversion in AlGaAs microdisks integrated in a photonic circuit -- 16. Tuning of Phonons and Surface Phonon Polaritons -- 17. Defect-related Optical Properties of ZnO Nanoparticles in ZnO/SiO₂ Systems -- 18. Integrated Slot Waveguide-based Phase Shifter -- 19. Radiation by a Finite-length Electric Dipole in a Uniaxial Medium -- 20. How Integrated Photonics can Help to Understand our Brain -- 21. Polarized and Diffracted Second Harmonic Generation from Semiconductor Metasurfaces -- 22. Simple Multidimensional Two-fluid Plasma Model Solver based on PseudoSpectral Time-Domain Method.

Sommario/riassunto

The investigation of light-matter interactions in materials, especially those on the nanoscale, represents perhaps the most promising avenue for scientific progress in the fields of photonics and plasmonics. This book examines a variety of topics, starting from fundamental principles, leading to the current state of the art research. For example, this volume includes a chapter on the sensing of biological molecules with optical resonators (microspheres) combined with plasmonic systems, where the response this system are described in a fundamental and elegant manner using coupled mode theory. Symmetry plays a major role in the book. One chapter on time reversal symmetry in electromagnetic theory describes how to control the properties of light (e.g. scattering and directionality of the flow of light) in materials with certain topological invariants. Another chapter where symmetry is prominent reformulates, using a gentle and pedagogical approach, Maxwell's Equations into a new set of fields that reveal a "handedness" symmetry in electromagnetic theory, which can be applied to photonic systems in, for example, the sensing of chiral molecules and understanding the conditions for zero reflection. Also, for students and researchers starting in the field of nanoplasmonics, the book includes a tutorial on the finite element time domain simulation of nanoplasmonic systems. Other topics include photonic systems for quantum computing, nanoplasmonics, and optical properties of nano and bulk materials. The authors take a pedagogical approach to their topic, making the book an excellent reference for graduate students and scientists starting in the fields of photonics or plasmonics.
