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Autore	JOYCE, Stanislaus
Titolo	My Brothers Keeper / Stanislaus Joyce
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Titolo	Photonic crystals : advances in design, fabrication, and characterization / / edited by K. Busch ... [et al.]
Pubbl/distr/stampa	Weinheim ; ; Cambridge, : Wiley-VCH, c2004
ISBN	9786610854257 9781280854255 1280854251 9783527602599 3527602593 9783527607174 352760717X
Descrizione fisica	1 online resource (382 p.)
Altri autori (Persone)	BuschK (Kurt)
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Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Photonic Crystals Advances in Design, Fabrication, and Characterization; Contents; Preface; About the editors; List of contributors; 1 On the solid-state theoretical description of photonic crystals; 1.1 Introduction; 1.2 Photonic band structure computation; 1.2.1 Density of states; 1.2.2 Group velocity and group velocity dispersion; 1.3 Nonlinear photonic crystals; 1.4 Finite structures; 1.5 Defect structures in photonic crystals; 1.5.1 Maximally localized photonic Wannier functions; 1.5.2 Wannier description of defect structures; 1.5.3 Localized cavity modes 1.5.4 Dispersion relations of waveguides1.5.5 Light propagation through photonic crystal circuits; 1.6 Conclusions; References; 2 Spontaneous emission in photonic structures: Theory and simulation; 2.1 Introduction; 2.2 Basic concepts; 2.2.1 Fermi's Golden Rule; 2.2.2 Beyond the simple picture; 2.2.3 Coherent tuning of spontaneous decay; 2.2.4 QED in a structured continuum; 2.3 Simulations; 2.3.1 Frequency domain; 2.3.2 Time domain; 2.4 Concluding remarks; References; 3 Semiconductor optics in photonic crystal structures; 3.1 Introduction; 3.2 Semiclassical theory; 3.2.1 Light-matter coupling 3.2.2 Generalized Coulomb potential3.2.3 Hamilton operator; 3.2.4 Equations of motion; 3.3 Numerical results; 3.3.1 Linear exciton absorption; 3.3.2 Coherently excited inhomogeneous populations; 3.3.3 Quasi-equilibrium inhomogeneous populations and nonlinear absorption; 3.3.4 Coherent wave packet dynamics versus dephasing and thermalization; 3.4 Summary and outlook; References; 4 Electrochemically-prepared 2D and 3D photonic crystals; 4.1 Introduction; 4.2 Materials; 4.2.1 Porous silicon; 4.2.2 Porous alumina; 4.2.3 Porous III-V semiconductors; 4.3 Application to photonic crystals 4.3.1 Introduction4.3.2 2D photonic crystals made of macroporous silicon; 4.3.3 Photonic defects in electrochemically-prepared 2D photonic crystals; 4.3.4 3D photonic crystals made of macroporous silicon; 4.3.5 2D photonic crystals made of porous alumina; 4.3.6 1D photonic crystals made of InP; 4.3.7 2D photonic crystals made of InP; 4.3.8 3D photonic crystals made of InP and GaAs; 4.4 Summary; References; 5 Optical properties of planar metallo-dielectric photonic crystals; 5.1 Introduction; 5.2 Optical characterization of individual gold nanodisks 5.3 Observation of Rayleigh anomalies in metallo-dielectric nanostructures5.3.1 Metallic nanoparticle arrays; 5.3.2 Metallic nanowire arrays; 5.4 Waveguide-plasmon polaritons: Strong coupling in a metallic photonic crystal; 5.4.1 Metallic nanoparticle arrays on dielectric waveguide substrates; 5.4.2 Metallic nanowire arrays on dielectric waveguide substrates; 5.4.3 Ultrafast dynamics of waveguide-plasmon polaritons; 5.5 A polymer DFB laser based on a metal nanoparticle array; 5.6 Summary; References; 6 Preparation of 3D photonic crystals from opals; 6.1 Introduction 6.2 Preparation of monodisperse colloids
Sommario/riassunto	The majority of the contributions in this topically edited book stems from the priority program SPP 1113 ""Photonische Kristalle"" run by the Deutsche Forschungsgemeinschaft (DFG), resulting in a survey of the current state of photonic crystal research in Germany. The first part of the book describes methods for the theoretical analysis of their optical properties as well as the results. The main part is dedicated to the fabrication, characterization and modeling of two- and three-dimensional photonic crystals, while the final section presents a wide spectrum of applications: gas sensors, micr