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Nota di contenuto	Photonics; Contents; List of Contributors; Preface; 1 Silicon Photonics; 1.1 Introduction; 1.2 Applications; 1.2.1 Interconnects; 1.2.2 Sensors and Spectroscopy; 1.3 Optical Functions; 1.3.1 Waveguides and Routing; 1.3.2 Wavelength Filtering; 1.3.3 Coupling to Fiber; 1.3.4 Electro-Optic and Opto-Electronic Conversion; 1.3.5 Lasers; 1.4 Silicon Photonics Technology; 1.4.1 Passive Circuits; 1.4.2 Modulators; 1.4.3 Active Tuning; 1.4.4 Photodetectors; 1.4.5 Lasers; 1.4.6 Photonic-Electronic Integration; 1.5 Conclusion; References; 2 Cavity Photonics; 2.1 Introduction; 2.2 Cavity fundamentals 2.3 Cavity-Based Switches2.4 Emitters in Cavities; 2.4.1 Weak Coupling: The Purcell Effect; 2.4.2 Strong Coupling: Vacuum Rabi Oscillations; 2.5 Nanocavity Lasers and LEDs; 2.6 Summary; Acknowledgments; References; 3 Metamaterials: State-of-the Art and Future Directions; 3.1 Introduction; 3.2 Negative-Index Materials; 3.3 Magnetic Metamaterials; 3.4 Graded-Index Transition Metamaterials; 3.5 Transformation Optics; 3.6 Metasurfaces; References; 4 Quantum Nanoplasmonics; 4.1 Introduction; 4.2 Spaser and Nanoplasmonics with Gain; 4.2.1 Introduction to Spasers and Spasing 4.2.2 Spaser Fundamentals4.2.3 Brief Overview of Latest Progress in Spasers; 4.2.4 Equations of Spaser; 4.2.5 Spaser in CW Regime; 4.2.6 Spaser as Ultrafast Quantum Nanoamplifier; 4.2.7 Compensation of Loss by Gain and Spasing; 4.2.8 Conditions of Loss Compensation by Gain and Spasing; 4.3 Adiabatic Hot-Electron Nanoscopy; 4.3.1 Introduction to Adiabatic Hot-Electron Nanoscopy; 4.3.2 Adiabatic Concentration of Optical Energy and Hot Electrons; 4.3.3 Adiabatic Hot-Electron Nanoscope; Acknowledgments; References; 5 Dielectric Photonic Crystals; 5.1 Introduction; 5.2 Fundamentals 5.2.1 Analogies5.2.2 1D PCs; 5.2.3 2D and 3D PCs; 5.2.4 Group Velocity Effects; 5.3 Fabrication Methods and Materials; 5.3.1 Microfabrication Techniques; 5.3.2 Other Physical Techniques; 5.3.3 Chemical Techniques; 5.3.4 Lithography Techniques; 5.3.5 Other Types of PCs; 5.4 Applications; 5.4.1 Fundamental Effects; 5.4.2 Lasers; 5.4.3 Sensors; 5.4.4 Add/Drop Filters; 5.4.5 Directional Couplers; 5.4.6 PC Fibers; 5.5 Conclusions; References; 6 Quantum Dots; 6.1 Introduction; 6.1.1 Infrared Detection Basics; 6.2 Quantum Dots for Infrared Detection 6.2.1 Benefits of Quantum Dots for Intersubband Detectors6.2.2 The Potential of QDIPs; 6.3 Quantum Dot Growth; 6.3.1 The Formation of Quantum Dots in the SK Growth Mode; 6.3.2 Properties of SK Grown Dots and Their Effect on QDIP Performance; 6.4 Device Fabrication and Measurement Procedures; 6.5 Gallium Arsenide-Based Quantum Dot Detectors; 6.5.1 InGaAs/InGaP QDIP; 6.5.2 First QDIP FPA; 6.5.3 Two Temperature Barrier Growth for Morphology Improvement; 6.6 Indium Phosphide-Based Quantum Dot Detectors; 6.6.1 InAs/InP QDIP; 6.6.2 Detection Wavelength Tuning Using Quantum Dot Engineering 6.6.3 High Operating Temperature Quantum Dot Detector and Focal Plane Array
Sommario/riassunto	Discusses the basic physical principles underlying thescience and technology of nanophotonics, its materials andstructures This volume presents nanophotonic structures and Materials.Nanophotonics is photonic science and technology that utilizeslight/matter interactions on the nanoscale where researchers arediscovering new phenomena and developing techniques that go wellbeyond what is possible with conventional photonics andelectronics.The topics discussed in this volume are: CavityPhotonics; Cold Atoms and Bose-Einstein Condensates; Displays;E-paper; Graphene; Integrated Photonics; Liquid Cry