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4.2.2 Spaser Fundamentals; 4.2.3 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 Analogies; 5.2.2 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 Detectors; 6.2.2 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 the science and technology of nanophotonics, its materials and structures. This volume presents nanophotonic structures and Materials. Nanophotonics is photonic science and technology that utilizes light/matter interactions on the nanoscale where researchers are discovering new phenomena and developing techniques that go well beyond what is possible with conventional photonics and electronics. The topics discussed in this volume are: Cavity Photonics; Cold Atoms and Bose-Einstein Condensates; Displays; E-paper; Graphene; Integrated Photonics; Liquid Cry
