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Nota di contenuto	Ultrafast Lasers Based on Quantum Dot Structures: Physics and Devices; Contents; Introduction; Acknowledgments; 1 Semiconductor Quantum Dots for Ultrafast Optoelectronics; 1.1 The Role of Dimensionality in Semiconductor Materials; 1.2 Material Systems Used; 1.2.1 III-V Epitaxially Grown Quantum Dots; 1.2.2 QD-Doped Glasses; 1.2.3 Quantum Dashes; 1.3 Quantum Dots: Distinctive Properties for Ultrafast Devices; 1.3.1 Inhomogeneous Broadening; 1.3.2 Ultrafast Carrier Dynamics; 2 Foundations of Quantum Dot Theory; 2.1 Energy Structure and Matrix Elements 2.2 Theoretical Approaches to Calculating Absorption and Gain in Quantum Dots 2.3 Kinetic Theory of Quantum Dots; 2.4 Light-Matter

Interactions in Quantum Dots; 2.5 The Nonlinearity Coefficient; 3 Quantum Dots in Amplifiers of Ultrashort Pulses; 3.1 Optical Amplifiers for High-Speed Applications: Requirements and Problems; 3.2 Quantum Dot Optical Amplifiers: Short-Pulse Operating Regime; 3.3 Quantum Dot Optical Amplifiers at High Bit Rates: Low Distortions and Patterning-Free Operation; 3.4 Nonlinear Operation and Limiting Function Using QD Optical Amplifiers; 4 Quantum Dot Saturable Absorbers

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Sommario/riassunto

In this monograph, the authors address the physics and engineering together with the latest achievements of efficient and compact ultrafast lasers based on novel quantum-dot structures and devices. Their approach encompasses a broad range of laser systems, while taking into consideration not only the physical and experimental aspects but also the much needed modeling tools, thus providing a holistic understanding of this hot topic.
