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Nota di contenuto	Physics and Properties of Quantum-dot Lasers -- Dynamics of Quantum-Dot Lasers Subject To External Optical Feedback -- Quantum-Dot Distributed Feedback Laser With Large Optical Mismatch -- Design And Optimization Of Quantum-Dot Optical Frequency Comb On Silicon -- Nonlinear Frequency Conversion In Epitaxial Quantum-Dot Laser On Silicon -- Conclusions And Perspectives.
Sommario/riassunto	This book provides guidelines and design rules for developing high-performance, low-cost, and energy-efficient quantum-dot (QD) lasers for silicon photonic integrated circuits (PIC), optical frequency comb generation, and quantum information systems. To this end, the nonlinear properties and dynamics of QD lasers on silicon are investigated in depth by both theoretical analysis and experiment. This book focuses on four issues encountered in developing silicon PIC: (1) The instability of laser emission caused by the chip-scale back-reflection. (2) The degradation of laser performance at a high operating temperature. (3) The limited phase noise level and optical bandwidth of the laser, which are the bottlenecks for further increasing the transmission capacity. (4) The need for a platform with rich optical nonlinearities for future integrated quantum technologies. The promising results presented in each of these areas will enable

scientists, researchers, and engineers to make an informed judgment when utilizing the QD laser for applications ranging from classical silicon PIC to integrated quantum technologies.

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