



Silicon Photonics for Telecommunications and Biomedicine

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Given silicon's versatile material properties, use of low-cost silicon photonics continues to move beyond light-speed data transmission through fiber-optic cables and computer chips. Its application has also evolved from the device to the integrated-system level. A timely overview of this impressive growth, **Silicon Photonics for Telecommunications and Biomedicine** summarizes state-of-the-art developments in a wide range of areas, including optical communications, wireless technologies, and biomedical applications of silicon photonics.

With contributions from world experts, this reference guides readers through fundamental principles and focuses on crucial advances in making commercial use of silicon photonics a viable reality in the telecom and biomedical industries. Taking into account existing and anticipated industrial directions, the book balances coverage of theory and practical experimental research to explore solutions for obstacles to the viable commercialization of silicon photonics.

The book's special features include:

- A section on silicon plasmonic waveguides
- Detailed coverage of novel III-V applications
- A chapter on 3D integration
- Discussion of applications for energy harvesting/photovoltaics

This book reviews the most important technological trends and challenges. It presents topics involving major silicon photonics applications in telecommunications, high-power photonics, and biomedicine. It includes discussion of silicon plasmonic waveguides, piezoelectric tuning of silicon's optical properties, and applications of two-photon absorption. Expert authors with industry research experience examine the challenge of hybridizing III-V compound semiconductors on silicon to achieve monolithic light sources. They also address economic compatibility and heat dissipation issues in CMOS chips, challenges in designing electronic photonics integrated circuits, and the need for standardization in computer-aided design of industrial chips.

This book gives an authoritative summary of the latest research in this emerging field, covering key topics for readers from various disciplines with an interest in integrated photonics.

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