

Preface to the Sixth Edition

The field of integrated optics has changed considerably in the past 7 years. The dimensions of photonic devices to be integrated have decreased by several orders of magnitude. Previously, the topics covered in chapters of this book might be described as belonging to the field of microphotronics, since they involved photons of light interacting with physical structures having dimensions mostly on the order of micrometers. The two exceptions were gratings and quantum wells, some of which had periodicity on the order of 100 nm. As fabrication techniques have progressed it has become possible to produce nanometer-sized structures such as quantum wires, quantum dots, holographic optical elements (HOEs), and photonic crystals (PhCs). These new devices have greatly changed both the size and performance of integrated-optic circuits.

In response to these new developments, a new chapter has been added to this sixth edition: Nanophotonics. The important topics of confinement of photons and electrons, photonic crystals and nanophotonic devices are covered in this new chapter. Techniques for fabricating and evaluating nanostructures are also described. All the other chapters have also been updated to include new developments and literature references. Additional practice problems have been added to all chapters, and an updated booklet of problem solutions is available.

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