



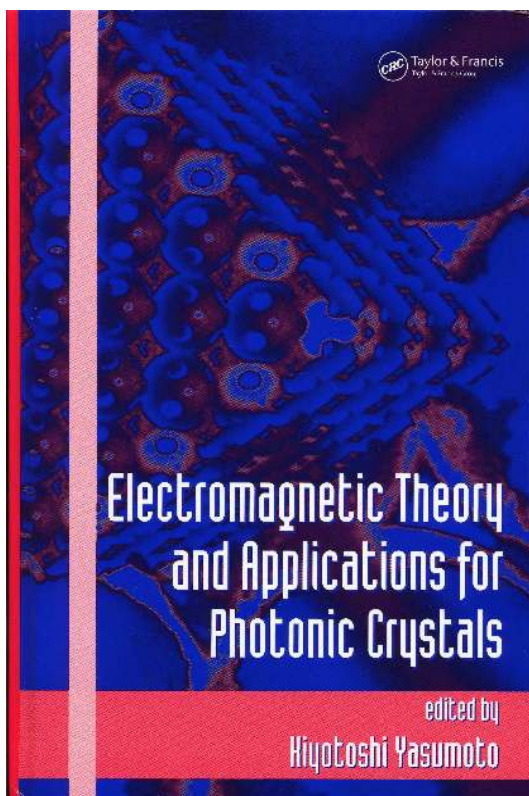
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## Electromagnetic Theory and Applications for Photonic Crystals

**Kiyotoshi Yasumoto** *Kyushu University, Fukuoka-shi, Japan*

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- Provides comprehensive theoretical treatment of periodic structures based on general electro-magnetic theory
- Presents the original work of the authors, all recognized experts in their fields
- Builds a theoretical basis for periodic structures applicable to photonic crystals in optical to microwave regions
- Progresses smoothly and logically from analytical to numerical to computational approaches
- Illustrates the discussion with more than 250 figures and 1000 equations

Photonic technology promises much faster computing, massive parallel processing, and an evolutionary step in the digital age. The search continues for devices that will enable this paradigm, and these devices will be based on photonic crystals. Modeling is a key process in developing crystals with the desired characteristics and performance, and *Electromagnetic Theory and Applications for Photonic Crystals* provides the electromagnetic-theoretical models that can be effectively applied to modeling photonic crystals and related optical devices.

The book supplies eight self-contained chapters that detail various analytical, numerical, and computational approaches to the modeling of scattering and guiding problems. For each model, the chapter begins with a brief introduction, detailed formulations of periodic structures and photonic crystals, and practical applications to photonic crystal devices. Expert contributors discuss the scattering matrix method, multipole theory of scattering and propagation, model of layered periodic arrays for photonic crystals, the multiple multipole program, the mode-matching method for periodic metallic structures, the method of lines, the finite-difference frequency-domain technique, and the finite-difference time-domain technique.

Based on original research and application efforts, *Electromagnetic Theory and Applications for Photonic Crystals* supplies a broad array of practical tools for analyzing and designing devices that will form the basis for a new age in computing.

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# Electromagnetic Theory and Applications for Photonic Crystals

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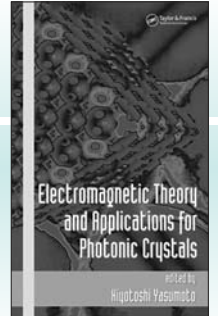
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