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Título: Photonic Crystals: Mathematical Analysis And Numerical Approximation

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This book concentrates on the mathematics of photonic crystals, which form an important class of physical structures investigated in nanotechnology. Photonic crystals are materials which are composed of two or more different dielectrics or metals, and which exhibit a spatially periodic structure, typically at the length scale of hundred nanometers.

In the mathematical analysis and the numerical simulation of the partial differential equations describing nanostructures, several mathematical difficulties arise, e. g., the appropriate treatment of nonlinearities, simultaneous occurrence of continuous and discrete spectrum, multiple scales in space and time, and the ill-posedness of these problems.

This volume collects a series of lectures which introduce into the mathematical background needed for the modeling and simulation of light, in particular in periodic media, and for its applications in optical devices.