

This thesis is a theoretical study of the interaction between light and sound in photonic structures, with which it is possible to control the light and sound at the same time. This interaction in such structures is studied both from a macroscopic point of view (design of structures for the confinement and guiding of electromagnetic waves and elastic) and microscopic (study of photon-phonon interaction in microcavities to get optical gain and quantum theoretical development of models for understanding of this interaction).