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ΔΙΑΛΕΞΗ

“Design of periodic nanostructures for light localization and propagation control”

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Αίθουσα σεμιναρίων στο ισόγειο του ΕΙΕ

Design of periodic nanostructures for light localization and propagation control.

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There have been several attempts to localize light in subwavelength volumes. One of the most popular approaches uses metallic nanostructures where surface plasmon polaritons can be excited and metallic nanoparticles act as nanoantennas that strongly localize the electromagnetic field. This concept has been used to design materials and surfaces that can control light transmission, and reflection, polarization and phase, and promise a new generation of passive optical components with applications in light generation and harvesting, microscopy, as well as optical and chemical sensors, and even guiding light through subwavelength waveguides. We will review our work on plasmonics, and metamaterials and discuss our ideas for low-loss, all dielectric, structures that mimic the functionality of metallic nanopatterned surfaces. Additionally we will present results on the design of active elements that use the acousto-optic interaction to control light by creating structures that show simultaneous photonic and phononic band gaps, sometimes called phoxonic crystals. Such structures can be used to simultaneously localize optical and elastic fields inside cavities and waveguides, enhance the interaction, and lead to miniaturized acousto-optic devices.