

INSTITUTO DE ESTRUCTURA DE LA MATERIA

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SEMINARIOS 2022

DIELECTRIC NANOANTENNAS FOR LIGHT PROPAGATION AND EMISSION CONTROL

Optically resonant dielectric nanostructures, often called dielectric nanoantennas, have emerged as a promising platform for light manipulation at the nanoscale. From a basic research perspective, they are interesting because they support a rich phenomenology of optical modes that can mutually interfere, giving rise to intriguing effects in their scattering properties, ranging from strong directionality, to scattering suppression or anapole-like modes, to collective resonances with extremely long photon lifetimes.

From a practical point of view, they are particularly appealing for industrial applications because they can be free from dissipative losses, making for high efficiency devices, and because they are “CMOS friendly”, i.e. they can be fabricated using some of the standard materials and processes from the semiconductor industry.

In this talk, we will first introduce some of the basic concepts and phenomenology associated to the scattering of light by dielectric nanoantennas and, then, present some of the emerging applications and technologies in which they can make an impact. In this regard, we will show how they can be used to shape the wavefront of light both passively and dynamically, as to create, for example, ultra-thin lenses or holographic displays, or how they can be used to create miniaturized, mirrorless lasers with unconventional emission properties. Finally, we will point out some of the challenges and opportunities that are arising in this quickly-expanding field of research.

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16.00 H

<https://youtu.be/gJ9Loqe68Ow>

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