

Optical metamaterials and applications

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Recent advances in nanotechnology and nanofabrication have made possible to create artificial optical materials (i.e, metamaterials) with fascinating optical properties, and nanostructure optical media that can concentrate and manipulate light at nanoscopic scales. This new research line has opened the way to new photonic applications with great technological potential, such as nano-lasers, nano-biosensors, nanoscopic photonic systems, and artificial optical materials with enhanced optical properties. In this talk, I will discuss our recent research in some of these directions, including the use of active and passive plasmonic metasurfaces for devising ultra-thin optical elements and biosensors, and epsilon-near-zero plasmonic systems for achieving efficient ultra-fast metamateria-based nonlinear optical devices.

Bio:

Israel De León received his Ph.D. degree in electrical engineering from the University of Ottawa in 2011 for his theoretical and experimental work in active plasmonics. His Ph.D. dissertation was recognized with various academic awards, including the prestigious Governor General's Gold Medal for the highest academic standing at the graduate level in Canada. Following this, he was a CERC (Canada Excellence Research Chair) postdoctoral fellow and staff researcher at the Max Planck Centre for Extreme and Quantum Photonics in Canada, in the research group of Prof. Robert W. Boyd.

In 2015, Israel De León joined the School of Engineering and Sciences at Tecnológico de Monterrey as a research professor, where he carries investigations in the field of nanophotonics -- the science and applications of light at the nanoscale. Prof. De León is a member of the Mexican National Research System and a researcher member of the Max Planck Center for Extreme and Quantum Photonics since 2015, and an adjunct professor of the School of Electrical Engineering and Computer Science of the University of Ottawa since 2019.

Prof. De León has a broad research interest in the fields of nanophotonics aiming at multidisciplinary applications. Some of the topics that he investigates include: the interactions between molecules and light at the nanoscale, nonlinear optical phenomena in nanophotonic systems, physics and applications of optical metamaterials, nanofabrication techniques, and ultrasensitive bio/chemical detection using optical methods.

Website:

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