

Polaritonic metasurfaces

Andrea Alù

Photonics Initiative, Advanced Science Research Center, City University of New York
Physics Program, Graduate Center, City University of New York
Department of Electrical and Computer Engineering, City College of New York
85 St. Nicholas Terrace, New York, NY 10031, U.S.A.
aalu@gc.cuny.edu, <http://alulab.org>

In this talk, I discuss our recent efforts in the context of nano-optics and photonics, with a special emphasis on strong light-matter interactions enabled by exciton, phonon and electronic resonances in polaritonic metasurfaces. I will discuss our recent theoretical and experimental results in the context of polariton manipulation based on excitons, intersubband transitions and phonons interacting with light. The combination of these features with photonic engineering enables giant optical nonlinearities, efficient nanoscale light manipulation and topological transitions. During the talk, I will discuss the exotic light-matter interactions arising in these systems, and their opportunities for wave physics and photonics technologies.



Andrea Alù is a Distinguished Professor at the City University of New York (CUNY), the Founding Director of the Photonics Initiative, CUNY Advanced Science Research Center, and the Einstein Professor of Physics at the CUNY Graduate Center. He received his Laurea (2001) and PhD (2007) from the University of Roma Tre, Italy, and, after a postdoc at the University of Pennsylvania, he joined the faculty of the University of Texas at Austin in 2009, where he was the Temple Foundation Endowed Professor until Jan. 2018. Dr. Alù is a Fellow of NAI, AAAS, IEEE, AAAS, OSA, SPIE and APS, and has received several scientific awards, including the Blavatnik National Award in Physical Sciences and Engineering, the IEEE Kiyo Tomiyasu Award, the Vannevar Bush Faculty Fellowship, and the NSF Alan T. Waterman award.