

“Non-Linearity, Non-Reciprocity, and Gain: Exciting Venues for Metamaterials and Plasmonics”

Lecturer:

Prof. Andrea Alù



University:

The University of Texas at Austin, Austin, United States of America

Area:

Department of Electrical and Computer Engineering

Abstract:

Metamaterials and plasmonics offer unprecedented opportunities to tailor and enhance the interaction of waves with materials. In this talk, I discuss our recent research activity in electromagnetics, nano-optics and acoustics, showing how suitably tailored meta-atoms and arrangements of them open exciting venues to manipulate and control waves in unprecedented ways. I will discuss our most recent theoretical and experimental results, including metasurfaces to control wave propagation, scattering and radiation, large nonreciprocity without magnetism, giant nonlinearities in properly tailored metamaterials, and parity-time symmetric meta-atoms and metasurfaces. Physical insights into these exotic phenomena, new devices based on these concepts, and their impact on technology will be discussed during the talk.

Biography:

Andrea Alù is an Associate Professor and the David & Doris Lybarger Endowed Faculty Fellow in Engineering at the University of Texas at Austin. He received his PhD from the University of Roma Tre, Italy, in 2007 and, after a postdoc at the University of Pennsylvania, he joined the faculty of the University of Texas at Austin in 2009. His current research interests span over a broad range of areas, including metamaterials and plasmonics, electromagnetics, optics, photonics and acoustics. He is the co-author of an edited book on optical antennas, 22 book chapters, over 400 conference papers, and over 250 journal papers in the top journals in science and engineering. Dr. Alù is a Fellow of IEEE and OSA, and has received several scientific awards, including the OSA Adolph Lomb Medal (2013), the KNAW Visiting Professorship from the Royal Netherlands Academy of Arts and Sciences, the IEEE MTT-S Outstanding Young Engineer award (2014), the IUPAP Young Scientist Prize in Optics (2014), the SPIE Early Career Investigator Award (2012), the URSI Issac Koga Gold Medal (2011), an NSF CAREER award (2010), the AFOSR and the DTRA Young Investigator Awards (2010, 2011). He serves on the Editorial Board of Physical Review B, Advanced Optical Materials and Scientific Reports, is an Associate Editor of five journals, including the IEEE Antennas and Wireless Propagation Letters and Optics Express, and has been elected an APS Outstanding Referee since 2014. He has been serving as OSA Traveling Lecturer (since 2010), as IEEE AP-S Distinguished Lecturer (since 2014), and as the IEEE joint AP-S and MTT-S chapter chair for Central Texas (since 2011).