

Half-day Short Course offered at the XXX URSI General Assembly, Istanbul, Turkey

## **Metamaterials and Plasmonic Materials: Theory and Electromagnetic Applications**

Instructor: Prof. Andrea Alù, The University of Texas at Austin

This short course will provide a broad introduction to the field of metamaterials and plasmonics, covering a wide range of topics, from the theoretical approaches to study anomalous wave propagation in periodic arrays, to their application in a variety of fields of research and over a wide spectrum of frequencies. The course will focus on various exciting properties of metamaterials and plasmonic materials, from their theoretical and numerical modeling and rigorous homogenization principles, to their practical application to realize electromagnetic cloaks, negative-index materials, sub-diffractive waveguides and antennas, enhanced nonlinearities, sensing, imaging and energy harvesting devices, optical nanocircuits and nanoantennas and various other exciting applications. We will discuss in detail how the metamaterial concepts may be applied to various problems of interest to overcome current technological challenges and provide a breakthrough in various applied fields related to electromagnetics and radio-science.

**Duration:** Half-day

**Method of presentation:** Interactive lectures with Powerpoint slides

**Course material:** Notes distributed during the course to all attendees

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**Bio:** Andrea Alù is an Assistant Professor at The University of Texas at Austin. He received two MS degrees and his PhD from the University of Roma Tre, Rome, Italy, respectively in 2001, 2003 and 2007. Until 2008 has developed significant parts of his PhD and postgraduate research at the University of Pennsylvania, Philadelphia, PA. He has authored over 120 journal papers, 15 book chapters and 235 conference papers that have received over 2,100 citations. His current research interests span over a broad range of areas, including metamaterials and plasmonics, electromagnetics, optics and photonics, cloaking and transparency, nanocircuits and nanostructures modeling, miniaturized antennas and nanoantennas, RF antennas and circuits. Dr. Alù is an Associate Editor of the IEEE Antennas and Wireless Propagation Letters, guest editor of several special issues on metamaterials and plasmonics and he has been the recipient of several international awards and recognitions for his research studies, among which the 2011 Isaac Koga Gold Medal, the 2010 NSF Faculty Early Career Development (CAREER) Award, the 2010 AFOSR Young Investigator Award, four URSI Young Scientist Awards and the Raj Mittra Travel Grant Young Researcher Award.