USC Viterbi
School of Engineering
Ming Hsieh Department of Electrical and Computer Engineering

Ming Hsieh Institute **Seminar**

Seminar

IEEE GRSS-APS-SSCS Joint Student Chapter seminar series

Prof. Stefano Maci
IEEE AP-S Past President
University of Sienna, Italy

"Metasurface Antennas"

Date: Wednesday, Oct 30th, 2024 - Time: 10:00-11:00 AM (PDT) - Location: RTH 211
Zoom Link/Code: Meeting ID: 925 1030 8883, Passcode: 613281
Register here
Refreshments will be provided

Abstract: Metasurfaces belong to the category of thin metamaterials and find applications across a wide frequency range, from microwaves to optical frequencies, for developing innovative electromagnetic engineering devices. These surfaces are created by densely arranging small elements on or etching them into a dielectric substrate in a locally periodic distribution. By adjusting the dimensions of these elements while maintaining sub-wavelength 2D periodicity, a pixelated visual appearance and an electromagnetic modulation of the equivalent local impedance boundary conditions (IBC) are achieved. The manipulation of IBC allows for localized modifications in the dispersion equation, influencing the local wavevector while maintaining a constant operating frequency. This capability enables the transformation of surface or guided waves into various wavefield configurations with specified properties. This presentation will focus on the control of both surface waves and space waves, showcasing examples such as the design of high-gain, low cross-polarization antennas, multibeam antennas, and scanning beam flat lenses. Emphasis will be given to space applications. The discussion will also delve into the third generation of adaptive metasurfaces (MTSs), featuring dynamically reconfigurable boundary conditions. This advancement opens possibilities for exploring new perspectives in the development of next-generation wireless communication systems.

Biography: **Prof. Stefano Maci** is a Professor at the University of Siena (UNISI). Since 2000, he has been P.I. of 10 research projects funded by the European Union (EU) and by the European Space Agency (ESA). He is a Fellow of IEEE since 2004. In 2004 he founded the European School of Antennas (ESoA), a PhD school that presently comprises 35 courses on Antennas, Propagation, and Electromagnetic Theory, and 200 teachers, among them 20 IEEE Fellow. He has been advisor of 40 PhD students. He has been former member of IEEE Antennas and Propagation Society (AP-S) AdCom, the Chair of the Award Committee of the IEEE AP-S, member of the AP Executive Board of IET (UK), Distinguished Lecturer of IEEE and of EurAAP. He was recipient of several prizes and awards, among which the EurAAP Award 2014, the Chen-To Tai Distinguished Educator award 2016, of the Shelkunoff Transaction Prize in 2015, and of the URSI Dellinger Gold Medal in 2020. He is presently Director of ESoA. He has been TPC Chair of the METAMATERIAL 2020 and and General Chair of EuCAP 2023. He was the president of the IEEE Antennas and Propagation Society 2023. In the last ten years he has been invited 60 times as key-note speaker in international conferences. His research activity is documented in 200 papers published in international journals, (among which 100 on IEEE journals), 10 book chapters, and about 450 papers in proceedings of international conferences.

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