

Nebraska Center for Materials and Nanoscience

2018 Fall Seminar Series

Francesco Monticone

Cornell University

Advanced Material Platforms for Electromagnetic Wave Manipulation



The interaction of electromagnetic waves with materials underpins a large variety of phenomena we are familiar with from our everyday experience, as well as many devices that have a large impact in our lives, from cellphone antennas and weather radars, to optical fibers and lasers. Interestingly, with the advent of metamaterials, nanophotonics, and nanotechnology in the past decades, several examples of anomalous wave-matter interactions have been demonstrated, which may pave the way for a new generation of devices and applications. In this talk, we will review some of our recent works in developing novel engineered materials to manipulate electromagnetic waves, and our efforts in understanding some of their fundamental limits and tradeoffs. We will focus on topics at the frontier of this broad area of research, with emphasis on new approaches to control (1) light scattering (invisibility devices, etc.), (2) light confinement (bound states in the continuum), (3) optical forces, and (4) light guiding (topological/nonreciprocal materials).

Francesco Monticone is an Assistant Professor of Electrical and Computer Engineering at Cornell University. He received the B.Sc. and M.Sc. (summa cum laude) degrees from Politecnico di Torino, Italy, in 2009 and 2011, respectively, and the Ph.D. degree in Electrical and Computer Engineering from The University of Texas at Austin, Austin, TX, in 2016. Dr. Monticone joined the faculty of Cornell University in January 2017.

Dr. Monticone's current research interests are in the areas of applied electromagnetics, metamaterials, plasmonics, and nanophotonics, with particular focus on innovative and extreme aspects of wave interaction with engineered materials and nano-structures. In these areas, Dr. Monticone has authored and co-authored more than 100 scientific contributions in peer-reviewed journal papers, book chapters, and peer-reviewed conference proceedings, receiving more than 2400 citations, and has given over 20 invited talks. His first-author papers have appeared in several high-impact journals, including Physical Review Letters (three times selected as "Editor's Suggestion"), Nature Nanotechnology, Proceedings of the IEEE, Optica, and Science. Dr. Monticone is a member of the IEEE, the American Physical Society (APS), the Optical Society of America (OSA), and a full member of the International Union of Radio Science (URSI).



November 14, 2018 | 4 p.m. | 136 Jorgensen Hall

Refreshments in 1st floor vending area at 3:45

Host: Christos Argyropoulos

Department of Electrical & Computer Engineering

