

# THE DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING SPEAKER SERIES

**PRESENTS**

## **Interesting electromagnetic phenomena in metamaterials and some applications**



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**Monday, 10/15, 9:55 am**

**Room W122, Engineering Building 2**

### **LECTURE ABSTRACT**

Metamaterials and metasurfaces started a new era in electromagnetics and optics where the nearfields are controlled to provide macroscopic field properties that would otherwise be difficult to achieve in nature. I will discuss homogenization of metamaterials, wave propagation in metamaterials, including anisotropic effects like in the so called hyperbolic medium and possible applications of such electromagnetic effects. In the last part I will introduce the concept of multimode field degeneracy and exceptional points that in the last years has been an emerging area of research and show possible applications and benefits in the design of oscillators and lasers.

### **SPEAKER BIOSKETCH**

Filippo Capolino received the Laurea (cum laude) and the Ph.D. degrees in electrical engineering from the University of Florence, Florence, Italy, in 1993 and 1997, respectively. From 1997 to 1999, he was a Fulbright and then a Post-Doctoral Fellow with the Department of Aerospace and Mechanical Engineering, Boston University, Boston, MA, USA. From 2000 to 2001, part of 2005 and in 2006, he was a Research Assistant Visiting Professor with the Department of Electrical and Computer Engineering, University of Houston, Houston, TX, USA. From 2004 to 2009, he was the EU Coordinator of the EU Doctoral Programs on Metamaterials, European Commission. Since 2003, he has been a short-term Visiting Professor with the Fresnel Institute, Marseille, France. Since 2010, he has been with the Centre de Recherche Paul Pascal, Bordeaux, France. He has been an Assistant Professor with the Department of Information Engineering, University of Siena, Siena, Italy. He is currently a Professor with the Department of Electrical Engineering and Computer Science, University of California, Irvine, CA, USA. His current research interests include metamaterials and their applications, traveling wave tubes, oscillators, antennas, sensors in microwave and optical ranges, plasmonics, microscopy, wireless systems, millimeter-wave chip-integrated antennas, and applied electromagnetics in general. Dr. Capolino received the R. W. P. King Prize Paper Award from the IEEE Antennas and Propagation Society for the Best Paper of the Year 2000, by an author under 36. From 2002 to 2008, he served as an Associate Editor for the IEEE TRANSACTIONS ON ANTENNAS AND PROPAGATION. He is the Editor of the Metamaterials Handbook (Boca Raton, FL, USA: CRC Press, 2009).

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