



SEMINAR:

Metamaterials: from theoretical aspects to applications

Speakers: Prof. Filiberto Bilotti, Prof. Alessandro Toscano

(Università Roma TRE, Roma)

Date: 2 October 2013 @ 5:00 PM

Location: Room A204 - Polo Scientifico F. Ferrari - Povo

Note: The seminar will be held in English

Contact: Dr. Giacomo Oliveri (giacomo.oliveri@disi.unitn.it)

Since 2000, metamaterials have attracted the interest of the scientific community. They are engineered materials presenting an anomalous interaction with the electromagnetic field, resulting in physical properties not otherwise obtainable through the use of natural materials. The new properties made possible by electromagnetic metamaterials have allowed us to review the whole classical electrodynamics from original perspectives, with important implications for science and applications. The use of metamaterials, in fact, allows on one hand to improve the performance of conventional electromagnetic devices and on the other hand, to design conceptually new devices such as perfect lenses or cloaking devices. Ultimately, the concept of metamaterial is considered today as an intermediate layer between the classical concepts of material and device in the so-called technological stack. The metamaterial, in fact, allows overcoming the concept of material intended as a mere support and is getting closer to being a functionalizing layer integrated into the device.

The aspects just described represent the theme of the seminar, which will be focused on the genesis of the metamaterial concept, the synthesis at microwave and optical frequencies, the most interesting applications in microwave and optical devices.

• **About the Speakers**

Prof. Filiberto Bilotti received the laurea and Ph.D. degrees both in electronic engineering from "Roma Tre" University, Rome, Italy, in 1998 and 2002, respectively. Since 2002, he has been with the Department of Engineering, "Roma Tre" University, where he works as an Associate Professor of electromagnetic field theory. His main research interests are in the microwave and optical applications of complex media, metamaterials and metasurfaces. He is the author of more than 350 papers in international journals, conference proceedings, and book chapters. From 2004 to 2008, he has been a member of the governing bodies of METAMORPHOSE, the European Network of Excellence on Metamaterials, where he acted as the coordinator of spreading activities. He is a member of the Steering Committee of the European Doctoral School on Metamaterials and the organizer of several international school events and international workshops and conferences in the field of metamaterials. He has been the local organizer of the First Congress on Advanced Electromagnetic Materials and Metamaterials in Microwaves and Optics-Metamaterials 2007 (Rome, Italy, October 2007) and served as the Chairman of the Steering Committee of the same conference for the period 2008–2013. Dr. Bilotti served also as a member of the Technical Program, the Steering Committee, and the Organizing Committee of several national and international conferences, as organizer and chairman of special sessions focused on the applications of metamaterials at microwave and optical frequencies, as a member of the Editorial Board of the journals *Metamaterials* and *International Journal on RF and Microwave Computer-Aided Engineering*, and as a Technical Reviewer of the major international journals related to electromagnetic field theory and metamaterials. Filiberto Bilotti was an elected member of the Board of Directors (2007–2012) and currently is the elected President (2013–2016) of the Virtual Institute for Artificial Electromagnetic Materials and Metamaterials (METAMORPHOSE VI, the International Metamaterials Society). He is a Senior Member of the IEEE and a Member of the Optical Society of America. Dr. Bilotti has been the recipient of the Raj Mittra Travel Grant Senior Researcher Award in 2007.

Prof. Alessandro Toscano was born in Capua on 26 June, 1964. He received the laurea and the Ph.D. degrees in electronic engineering from the University "La Sapienza", Rome, Italy, in 1988 and 1993, respectively. After a brief postdoctoral research experience at the Italian Space Agency, in 1994, he joined the Department of Applied Electronics at the University of Roma Tre, Rome, Italy, where is now Professor of electromagnetic field theory. His current research interests are computational electromagnetics and nonconventional materials and metamaterials for microwave and optical applications. He is (co-)author of more than 200 peer-reviewed scientific papers.