

Duration: 09:00 – 18:20

Room: N114

WS-09

Metamaterials, Metasurfaces and Applications

Organisers:

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Abstract

Victor Veselago first predicted the unique, unusual and exotic properties of metamaterials, particularly left-handed media, in 1968. However, David R. Smith and his team conducted the first experimental verification of such properties many years later, in 2000. This singular year is considered by many researchers involved in the topic to represent the onset of the Metamaterials History, initiated by its “big bang” after 32 years of latency. Therefore, 2018 is a key year, coinciding with the 50th anniversary of the seminal paper by Veselago, and with the adult age of Metamaterials. Since 2000, the research activity on the topic of metamaterials and artificial materials, and related topics, including metasurfaces, frequency selective surfaces, electromagnetic bandgaps, etc., has experienced a significant growth, and many applications, in fields as diverse as communications, sensing, or security, among others, have been reported. The aim of this workshop is to provide the attendees an overview of the research activity on the topic of microwave and THz metamaterials, with special emphasis on metasurfaces (a hot topic nowadays), and their applications. To this end, a balanced team of prominent researchers worldwide has been carefully selected. Workshop topics include metasurfaces for blazed gratings and reflectors, metasurfaces for sensing, metasurfaces for anomalous and negative refraction, high-gain antennas based on metasurfaces, metamaterials and metasurfaces based on active ‘negative’ elements, analytical circuit modeling of metasurfaces, wave propagation in time-modulated metamaterials, invisibility cloaks for advanced antennas, novel sensors and chipless-RFID systems based on metamaterials and symmetry, and industrial applications of metamaterials. These topics will be presented in a coherent manner in the workshop, and the different concepts introduced will be illustrated with multiple examples of applications, including applications in industry.

Programme

Metasurface for Blazed Gratings and Reflectors for Microwave through THz Applications

Tatsuo Itoh¹

¹University of California Los Angeles

Metasurfaces for Anomalous and Negative Refraction

Sergei Tretyakov¹

¹Aalto University

Terahertz Metasurfaces for High Sensitivity Thin-film Sensing Devices

Miguel Beruete¹

¹Universidad Pública de Navarra

Low Profile High Gain Antennas Based on Modulated Metasurfaces

Enrica Martini¹

¹University of Pisa

Radiofrequency Metamaterials and Metasurfaces based on Active ‘Negative’ Elements

Silvio Hrabar¹

¹University of Zagreb

Analysis of 2D Periodic Structures from an Equivalent Circuit Standpoint

Francisco Mesa¹

¹Universidad de Sevilla

Wave Propagation in Time-modulated Metamaterials

Andrea Alú¹

¹University of Texas Austin

From Artificial Electromagnetic Materials to Metamaterials: Unprecedented Properties for Conceptually New Microwave Devices

Filiberto Bilotti¹

¹Univerisy of Rome TRE

Novel Sensors and Chipless-RFID Systems Based on Metamaterials and Symmetry Properties

Ferran Martín¹, Paris Vélez¹, Cristian Herrojo¹

¹Universitat Autònoma de Barcelona

Commercializing Metamaterial Surface Antenna Technology: A Market-Driven Approach

Ryan Stevenson¹

¹KyMETA