

## On antenna value in the telecommunication industry: Information Theory and EM



Bruno Biscontini (Gualdo Tadino, Perugia, Italy, 1976) received the Laurea degree from the University of Perugia and the PhD degree (Hons.) from the Technical University of Munich (TUM), Germany.

From 2002 to 2006, he was a Research Scientist and an Assistant Professor with TUM, following several research paths on electromagnetic field theory, antennas and grid computing applied to electromagnetics. In 2006, he joined the telecommunications industry, covering several positions and roles. Since 2011, he has been the Director of RF System Engineering and the Chief AAS Architect with the German Research Center, Huawei Technologies, Munich. He is also elected as the Chairperson of the NGMN BASTA Active Antenna Group (NGMN Alliance, Frankfurt, Germany). He is the author or a coauthor of more than 25 publications in conferences, journals and books, and more than 40 patents.

Dr. Biscontini was awarded the “Dr. Spinner Prize” by TUM for his PhD thesis and the young scientist by IEEE for his work on grid computing for electromagnetics..



Alejandro Murrillo Barrera (Barcelona, Spain, 1976) received a M.Sc. degree in electrical engineering (UPV, Valencia, Spain, 2000) and a M.Sc. degree in mobile telecommunications (HiG, Gävle, Sweden, 2000).

He has covered several positions and roles in the telecommunication industry, including the direction of R&D teams in different cellular antenna companies. Since 2018, he works in active antenna system research in the German Research Center of Huawei. His technical interests include the fundamental limits of antennas and their associated degrees of freedom in the frame of the system performance for 5G+.



Philippe Ratajczak received the M.Sc. and Ph.D. degrees in electrical engineering from Université of Nice-Sophia Antipolis respectively in 1990 and 1995. In 1995 he joined the “antenna department” of CNET/France Telecom now Orange Innovation. Since 2014, He is co-head of the CREMANT, the antenna joint research center between Orange Innovation, the University of Nice and the CNRS (French National Scientific Research Center). His research interests include the areas of antennas and passive microwave components design, reflectarrays, artificial material antennas, reconfigurable antennas with beam scanning/forming capabilities, computational electromagnetics, electromagnetic modelling and simulation.



Andrea Schiavoni received the Electronic Engineer degree and the PhD in Electromagnetic Compatibility in 1990 and 1994. In 1993 he joined CSELT. He was involved in computational electrodynamics and measurement relevant to human exposure to electromagnetic fields from cellular phones. He developed and accredited the SAR laboratory in CSELT. From 2002 to 2008 he was responsible for OTA and SAR testing of UEs. Since 2012 he is involved in radio planning and exposure to electromagnetic fields from BTS. He is member of CEI CT106, IEC TC106, IEEE TC34 and NGMN BASTA. He is chair of NGMN BASTA. He was co-chair of IEEE P1528.7 “IEEE Guide for EMF exposure assessment IoT technologies and devices”.



Marco Donald Migliore received the Laurea (Hons.) and Ph.D. degree in electronic engineering from the University of Naples, Naples, Italy. He has been Visiting Professor at numerous Universities, such as the University of California at San Diego (USA), the University of Rennes I (France), the University of Brasilia (Brazil), the Harbin Technical University (China). He is currently a Full Professor with the University of Cassino and Southern Lazio, Cassino, Italy, where he is also the Director of the Microwave Laboratory. His current research interests include the connections between electromagnetics and information theory and antenna synthesis and analysis 5G and 6G.



Enrica Martini, Laurea degree (cum laude) in telecommunication engineering (University of Florence, Italy, 1998); PhD degree in informatics and telecommunications (University of Florence); PhD in electronics from (University of Nice-Sophia Antipolis, 2002).

(2002) Research Associate at the University of Siena, Italy. (2005) Electromagnetic Systems Section of the Ørsted•DTU Department at the Technical University of Denmark, after receiving the Hans Christian Ørsted Postdoctoral Fellowship. (2007-2017) Postdoctoral Fellow at the University of Siena. Co-founder (2012) and CEO (2016-2018) of Wave Up Srl (Siena, Italy). (2019-2021) Assistant professor at the University of Siena, where she is currently an Associate Professor.

Her research interests include metasurfaces and metamaterial characterization, metasurface-based antennas and microwave devices, electromagnetic scattering, antenna measurements.

Dr. Martini was a co-recipient of the 2016 Schelkunoff Transactions Prize Paper Award, and other awards at international conferences.

**Abstract:**

Current and incoming cellular communication systems demand increasing levels of performance and efficiency. Enhanced antenna systems, plus freshly incorporated radio-enhancement system components, are intended to contribute fundamentally to support the 5G-and-beyond requirements.

This workshop will focus on indicating and assessing technological directions that will boost the contribution at the RF resource level, through the deep understanding of the Information Theoretical potential of the Electro-Magnetic interface devices, e.g. antennas or RIS. Solutions like ultra-massive-MIMO or smart environment get intertwined with concepts such as Degrees of Freedom or Capacity, revealing with clarity the profit the industry can exploit from them.



**The 17<sup>th</sup> European Conference on  
Antennas and Propagation  
(EuCAP)  
26 - 31 March 2023**



**Workshop outline:**

Presentations, followed by Q&A + Panel discussion

Duration: 100 minutes