

Title: Microwave Metantennas: Wave Control using Metamaterials, Metasurfaces, and Metalines

Abstract: The physical concepts of metamaterials have revolutionarily reshaped electromagnetic research from microwave, terahertz to optics since later 1990s. With more and more exciting scientific findings, the next wave of metamaterials is to fuel the innovation of electromagnetic engineering for applications. In particular, the metamaterials is expected to spur the development of innovative antenna technology to meet the fast increasing demands in the market of wireless communications and radars. This talk will brief the unique electromagnetic properties. Then the unique changes of antenna design will be addressed. After that the development of metamaterial-based antenna technologies will be reviewed with the success stories of translational research of metamaterials, metasurfaces and metalines by speaker's team. Last speaker will comment on the development of metantennas in future.



Zhi Ning Chen received his BEng, MEng, and PhD degrees all in Electrical Engineering from the Institute of Communications Engineering (ICE), China and his second PhD degree from the University of Tsukuba, Japan, respectively.

During 1988~1995, he worked as a Lecturer and later an Associate Professor at ICE as well as a Postdoctoral Fellow and later an Associate Professor at Southeast University, China. During 1995~1997, he joined the City University of Hong Kong as a Research Assistant and later a Research Fellow. In 1997, he was awarded the Japan Society for the Promotion of Science (JSPS) Fellowship to conduct his research at the University of Tsukuba, Japan. In 2001 and 2004, he visited the University of Tsukuba under the JSPS Fellowship Program (at a senior level). In 2004, he worked as an Academic Visitor at IBM T. J. Watson Research Center, USA. In 2013, he visited “Laboratoire des Signaux et Systèmes”, UMR8506 CNRS-Supelec-University Paris Sud in Gif-sur-Yvette, France as a Senior DIGITEO Guest Scientist. During 1999~2016, he worked with the Institute for Infocomm Research (I2R) as Principal Scientist, Head for RF & Optical Department, and Technical Advisor. In 2012, he joined the Department of Electrical and Computer Engineering, National University of Singapore as a tenured Full Professor and now Program Director (Industry). He is holding/held the concurrent guest professorships at Southeast University (Changjiang Chair Professor), Nanjing University, Tsinghua University, Shanghai Jiaotong University, Tongji University, University of Science and Technology of China, Fudan University Dalian Maritime University, Chiba University, National Taiwan University of Science and Technology, Shanghai University, Beijing University of Posts and Telecommunications, Tohoku University, Beijing Institute of Technology, and City University of Hong Kong. He is also serving as the members of State Key Laboratory of Millimeter-waves at Southeast University and City University of Hong Kong.

Dr Chen is the founding General Chairs of International Workshop on Antenna Technology (iWAT in 2005), International Symposium on InfoComm & Mechatronics Technology in Bio-Medical & Healthcare Application (IS 3Tin3A in 2010), International Microwave Forum (IMWF

in 2010), and Asia-Pacific Conference on Antennas and Propagation (APCAP in 2012). He also involved many international events as General Chairs, Chairs and members for technical program committees and international advisory committees. He has been invited to deliver 80+ keynote/plenary/invited speeches at international academic and industry events.

Currently Dr Chen is interested in electromagnetic engineering and antennas/sensors for communication, radar, imaging and sensing systems. He has published 610+ academic papers and five books entitled Broadband Planar Antennas (Wiley 2005), UWB Wireless Communication (Wiley 2006), Antennas for Portable Devices (Wiley 2007), Antennas for Base Stations in Wireless Communications (McGraw-Hill 2009), and Handbook of Antenna Technologies with 76 chapters (by Springer References in 2016 as an Editor-in-Chief). He has also contributed the chapters to the books entitled UWB Antennas and Propagation for Communications, Radar, and Imaging (Wiley 2006), Antenna Engineering Handbook (McGraw-Hill 2007), Microstrip and Printed Antennas (Wiley 2010), and Electromagnetics of Body Area Networks (Wiley 2016). He is holding 27 granted/ filed patents with 38 licensed deals with industry. He is the recipient of International Symposium on Antennas and Propagation Best Paper Award 2010, the CST University Publication Awards 2008 & 2015, ASEAN Outstanding Engineering Achievement Award 2013, Institution of Engineers Singapore Prestigious Engineering Achievement Awards 2006, 2013(two project awards), and 2014, I2R Quarterly Best Paper Award 2004, IEEE iWAT 2005 Best Poster Award, several technology achievement awards from China during 1990-1997 as well as more than 21 academic awards by the students he supervised.

Dr Chen elevated a Fellow of the IEEE for the contribution to small and broadband antennas for wireless applications in 2007. He has served IEEE Council on RFID as a Vice President and a Distinguished Lecturer since 2015. He served IEEE Transaction on Antennas and Propagation as an Associate Editor and IEEE Antennas and Propagation Society as a Distinguished Lecturer.