

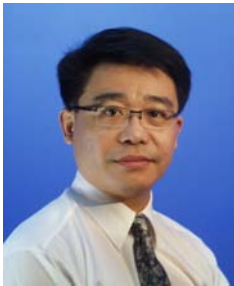
## Miniaturization of Ultra-wideband Antennas

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**Chair & Organizer :** Prof. Masahiko Nishimoto, IEEE AP-S Fukuoka Chapter  
**Time & Venue :** 14:30~16:00pm, 1<sup>st</sup> Nov. 2010 (Monday)  
General Laboratory 2F Multipurpose hall, Nagasaki University Bunkyo Campus

**About the Talk:** Ultra-wideband (UWB) has become the wireless technology for commercial next-generation short-range high-data-rate wireless communications, high resolution imaging, and high accuracy radar. The antenna is one of the key designs in UWB wireless systems. This talk starts with a brief introduction to design challenges of UWB antennas, followed by state-of-the-art solutions. Next, miniaturization technologies for UWB antennas are addressed. Planar designs are highlighted due to their unique merits and wide adoption in practical applications. First, a newly developed technique to achieve ground-independent UWB antenna performance, one of the most challenging issues in small antenna design, is addressed. A design example is used to elaborate the mechanism of the method. Based on this concept, an antenna with further reduced size is designed to fit wireless USB dongles. Furthermore, an innovative compact diversity UWB antenna shows the advantage of ground-independence for small antennas in diversity applications. Last, UWB antennas co-designed with filtering performance using bandpass/bandstop filters integrated into the antenna are proposed to reduce the overall size of devices and enhance antenna performance. At the end, the trends of UWB antenna R&D are discussed, correlated with applications and market demands.



Dr Zhi Ning Chen received his BEng, MEng, and PhDs degrees all in Electrical Engineering from the Institute of Communications Engineering (ICE), China and University of Tsukuba, Japan, respectively. During 1988-1995, he worked at ICE as Lecturer and later Associate Professor, as well as at Southeast University, China as a Postdoctoral Fellow and later as an Associate Professor. 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 a JSPS Fellowship to conduct his research at the University of Tsukuba, Japan. In 2001 and 2004, he visited the University of Tsukuba under a JSPS Fellowship Program (senior level). In 2004, he worked at IBM T. J. Watson Research Center, USA as an Academic Visitor. Since 1999, he has worked with the Institute for

Infocomm Research (formerly known as Center for Wireless Communications and the Institute for Communication Research) as Member of the Technical Staff (MTS), Principal MTS, Senior Scientist, and Lead Scientist. He is currently appointed as Principal Scientist and Department Head for RF & Optical and concurrently holds Visiting/Adjunct/Guest Professor appointments at Southeast University, Nanjing University, Shanghai Jiao Tong University, Tsinghua University, Tongji University, Dalian Maritime University, University of Science and Technology, China and the National University of Singapore. He was appointed as an Adjunct Professor/Associate Professor at Zhejiang University and Nanyang Technologies University.

Dr Chen has organized many international events as the general chair, technical program committee chair, and as a key member of organizing committees. He is the founder of the International Workshop on Antenna Technology (iWAT). He has published 290 journal and conference papers as well as authored and edited books entitled Broadband Planar Antennas, UWB Wireless Communication, Antennas for Portable Devices, and Antennas for Base Station in Wireless Communications. He also contributed to the books UWB Antennas and Propagation for Communications, Radar, and Imaging as well as Antenna Engineering Handbook. He is holding 25 granted and filed patents with 21 licensed deals with industry. He is the recipient of the CST University Publication Award 2008, IEEE AP-S Honorable Mention Student Paper Contest 2008, IES Prestigious Engineering Achievement Award 2006, I2R Quarterly Best Paper Award 2004, and IEEE iWAT 2005 Best Poster Award.

His current research interest includes applied electromagnetics, antennas for applications of microwaves, mmW, submmW, and THz in communication and imaging systems.

Dr Chen is a Fellow of the IEEE for his contribution to Small and Broadband Antennas for Wireless Applications, as well as Associate Editor of IEEE Trans. Antennas and Propagation. ([www1.i2r.a-star.edu.sg/~chenzn](http://www1.i2r.a-star.edu.sg/~chenzn))