**“UWB Antennas for Wireless Communication and Detection Applications”**

## IEEE MTT/AP Orlando Chapter Meeting

## **DATE/TIME: Wednesday, Sept. 16th, 2015 (5:00-6:00 PM)**

**SPEAKER:** Dr. Ahmed Kishk

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**ABSTRACT:**

Ultra-wide band (UWB) wireless communication occupies a bandwidth from 3.1 to 10.6 GHz, referred to as UWB band, to achieve high data rate over a short distance. Two competing schemes, namely multiband orthogonal frequency division multiplexing (MB-OFDM) and direct sequence ultra wide band (DS-UWB), were proposed to make use of the allocated bandwidth. Ideally, a transmitting/receiving UWB antenna pair comprising a communication channel should operate as a band-pass filter covering the UWB band and have a flat magnitude response and a linear phase response with frequency. It requires an UWB antenna well matched, with frequency independent phase center, and linearly increasing gain with frequency over the entire UWB band.

An omnidirectional UWB antenna is especially attractive to wireless communications at either base station or terminal side. Omnidirectional UWB antennas with a non-planar conducting structure as well as DRA are presented for an UWB access point.

Another recently addressed problem is the interference problem with the WLAN bands. To prevent interference problems due to existing nearby communication systems within an Ultra-wideband operating frequency, the significance of an efficient band notched design is increased. Two novel antennas are presented. One antenna is designed for one band-notch. The second antenna is designed for dual band-notches.

Several UWB antennas with unidirectional patterns are presented for detection applications. Dielectric resonator is used to tremendously shrink an UWB antenna’s size to be used as a sensor for breast cancer detection and microwave imaging. Another 3D conducting self-grounded Bow-Tie sensor is presented. The application of such a DR UWB antenna for thro-wall radar detection is also investigated showing better performance as compared to the Vivaldi antenna.

**BIOGRAPHY:**

Ahmed Kishk is a Professor at Concordia University, Montréal, Québec, Canada (since 2011) as Trier 1 Canada Research Chair in Advanced Antenna Systems. He received the BS degree in Electronic and Communication Engineering from Cairo University 1977, M.Eng and PhD degrees in 1983 and 1986, respectively from Department of Electrical Engineering, University of Manitoba, Canada. From December 1985-2011, he was a Professor at University of Mississippi. He was on sabbatical leave at Chalmers University of Technology, Sweden during the 1994-1995 and 2009-2010. He was an Associate Editor, a Feature Articles Editor, and Associate Editor of Antennas & Propagation Magazine (1990-1993), (1993-2014), and (2015-present), respectively. He is a distinguish lecturer for the Antennas and Propagation Society (2013-2015). He was an Editor-in-Chief of the ACES Journal from 1998 to 2001. He was the chair of Physics and Engineering division of the Mississippi Academy of Science (2001-2002). His research interest includes the areas of Dielectric resonator antennas, microstrip antennas, small antennas, RFID antennas for readers and tags, Multi-function antennas, microwave circuits, EBG, artificial magnetic conductors, soft and hard surfaces, and phased array antennas. He has published over 250-refereed Journal articles and 380 conference papers. He is a coauthor of four books and several book chapters and editor of three books. Dr. Kishk and his students have received several awards. Dr. Kishk received the 1995 and 2006 outstanding paper awards for papers published in the Applied Computational Electromagnetic Society Journal. He received the Microwave Theory and Techniques Society Microwave Prize 2004. He received 2013 Chen-To Tai Distinguished Educator Award of the IEEE Antennas and Propagation Society. Dr. Kishk is a Fellow of IEEE since 1998, Fellow of Electromagnetic Academy, and Fellow of the Applied Computational Electromagnetic Society (ACES).

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