

# IEEE Distinguished Lecturer Seminar - Ultrawideband (UWB) communications and ranging for sensor networks

## Details

### Speaker:

Prof. Andy Molisch  
Head of the Wireless Devices and Systems (WiDeS) Group,  
Dept. of Electrical Engineering, Viterbi School of Engineering  
University of Southern California USA

### Date:

Tuesday, 13 April 2010

### Time:

5:00 p.m. to 6:30 p.m. (Light refreshment starts at 4:45 p.m.)

### Venue:

Room 603, Chow Yei Ching Building

### Abstract:

Ultra-wideband (UWB) communications is an extremely promising technology for sensor networks. UWB offers high robustness to fading, low energy consumption, and the possibility for very precise geolocation. Recognizing these advantages, the IEEE has developed the 802.15.4a standard for communications and ranging with UWB devices. This standard, which covers both the PHY and the MAC layer, will be the main topic of this talk. It contains a number of scientific innovations that specifically exploit the sensor network applications. The physical layer is based on impulse radio, using bursts of impulses that allow coherent as well as noncoherent detection. Good spectral properties are obtained by polarization scrambling. On the MAC side, pure ALOHA, or a special form of CSMA are used, and provisions are made for ranging that is resistant to spoofing or interception. The talk will wrap up with a description of possible applications and networking considerations.

### Biography of the speaker:

Andreas F. Molisch (Fellow, IEEE) is Professor and Head of the Wireless Devices and Systems (WiDeS) group at the University of Southern California. Previously, he was Chief Wireless Standards Architect at Mitsubishi Electric Research Labs, Professor for Radio Systems at Lund University, Sweden, senior researcher at AT&T Bell Labs(NJ) and associate professor at the Technical University of Vienna, Austria. His current research interests are wireless propagation channels, MIMO systems, ultra-wideband (UWB) systems, and cooperative communications. He has authored, co-authored, or edited four books, 11 book chapters, more than 120

journal papers, and numerous conference contributions. He is inventor of more than 70 patents and (co-) author of 60 standards contributions, and has been chairman of various standardization and industrial groups in the area of MIMO and UWB. He is a Fellow of the IEEE, a Fellow of the IET, an IEEE Distinguished Lecturer, and recipient of several awards.

ALL ARE WELCOME

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