



HAWAII CENTER FOR ADVANCED  
COMMUNICATIONS

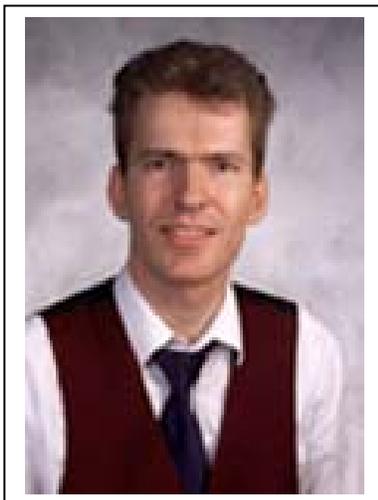
*Presents:*

## MIMO Antennas, Propagation Channels, and their Impact on System Design

**Andy Molisch, Ph.D.**

**Thursday, December 20, 2007, 11:00 – 12:00 a.m.  
Holmes Hall Room 389**

**Abstract:** Wireless multiple-input - multiple-output (MIMO) systems, defined as systems that have multiple antenna elements at both link ends, can greatly enhance the robustness and spectral efficiency of wireless communications. While most of the literature has concentrated on signal processing and space-time coding for MIMO, the fundamental performance limits are determined by the propagation channel and the way it is "excited" and "sampled" by the transmit and receive antenna arrays, respectively. In this talk, we first give an overview of array design, in particular, the question of how close we can space antennas. Subsequently, we describe typical propagation channels and how they impact system capacity; we also consider ways to describe the interaction between antennas and channels. Throughout the talk, we will show how the antenna and channel properties impact system capacity, diversity, and other system performance parameters.



**Dr. Andy Molisch** is a Distinguished Member of Technical Staff at Mitsubishi Electric Research Labs, and also Professor and Chairholder for Radio Systems at the Department of Electro- and Information Technology at Lund University, Sweden. His areas of interest are wireless propagation, MIMO, UWB, and cooperative communications. He has authored four books (among them the recent textbook "Wireless Communications"), eleven book chapters, some 100 journal papers, and numerous conference contributions, as well as 60 patents. He is active in standardization and other international organizations: IEEE 802.15.3a, IEEE 802.15.4a (chairman of channel modeling group), IEEE 802.11n, Multiband-OFDM alliance (chairman of scalability group), COST273 (chairman of the channel modeling group), and chairman of Commission C of URSI (International Union of Radio Science). He is also an editor of IEEE Trans. Wireless Communications, guest editor of special issues of IEEE JSAC

and Proceedings of the IEEE, and general chair, TPC chair, and symposium chair of numerous conferences. Dr. Molisch is a Fellow of the IEEE for contributions to wireless propagation channel modeling, an IEEE Distinguished Lecturer, and recipient of several awards.