

**Title:** Massive MIMO for 5G Wireless

**Speaker:** Erik G. Larsson, Professor, Linköping University in Sweden, visiting fellow at Princeton University

**Time & Location:** Monday, May 18, 2015 11:00 a.m. ECE 202

**Abstract:**

Massive MIMO is a leading 5G technology candidate, that aims at delivering uniformly good service to wireless terminals in high-mobility environments. The key concept is to equip base stations with large arrays of antennas that serve many terminals simultaneously, in the same time-frequency resource. Massive MIMO arrays have attractive form factors, for example, at the 2 GHz band, a  $\lambda/2$ -spaced rectangular array with 200 dual-polarized elements would be about 1.5 x 0.75 meters large. Massive MIMO operates in TDD mode and the downlink beamforming exploits the reciprocity of radio propagation --- specifically the base station array uses channel estimates obtained from uplink pilots transmitted by the terminals. This makes Massive MIMO entirely scalable with respect to the number of base station antennas. Base stations in Massive MIMO operate autonomously, with no sharing of payload data or channel state information. This talk will discuss various aspects of the massive MIMO concept, and discuss the possibilities and limiting factors of massive MIMO systems. Some common misconceptions regarding massive MIMO technology will also be resolved.

**Bio:**

Erik G. Larsson is Professor at Linköping University in Sweden and currently also a visiting fellow at Princeton University. His main professional interests are within the areas of wireless communications and signal processing. He has published some 100 journal papers on these topics, he is co-author of the textbook Space-Time Block Coding for Wireless Communications (Cambridge Univ. Press, 2003) and he holds 13 issued and many pending patents on wireless technology. He has served as Associate Editor for several major IEEE journals. He serves as chair of the IEEE Signal Processing Society SPCOM technical committee in 2015-2016, and as chair of the steering committee for the IEEE Wireless Communications Letters in 2014-2015. He is active in conference organization, most recently as the General Chair of the Asilomar SSC Conference 2015 (he was Technical Chair in 2012). He received the IEEE Signal Processing Magazine Best Column Award twice, in 2012 and 2014, and he is receiving the Stephen O. Rice Prize in Communications Theory in 2015.