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**Advanced Communication Center**  
**RFIC Day**

Keynote speaker  
**Professor Peter Kinget,**  
**Columbia University**

**November 8<sup>th</sup>, 2009; 8:30-15:30 at**  
**Zeevi Hall, Beit HaTfutzot, Tel Aviv University**

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**Short course: Designing Analog and RF circuits for Ultra-low Supply Voltages**

Many trends in IC technology and its applications are driving the supply voltage for integrated circuits down into the sub-1V region. Whereas important advantages for ultra-low voltage digital circuits have been demonstrated, the design of ultra-low voltage analog and RF integrated circuits poses a lot of challenges and require the rethinking of many basic analog circuit blocks. We will discuss these challenges and also opportunities for designing analog and RF integrated circuits to operate from ultra-low supply voltages down to 0.5V. Solutions ranging from exploiting the 4-terminals of the MOS device or the threshold voltage dependence on channel length, to the use of circuit topologies that require only stacks of two devices are discussed. The realization of full analog and RF system functions including 0.5V continuous-time filters, 0.5V pipelined and continuous-time sigma-delta ADC, 0.6V voltage references and 0.6V 2.4GHz RF receivers and synthesizers is demonstrated and the enabling architecture modifications are introduced.

The techniques and results developed in this research aim to enable ultra-low voltage analog and RF circuits both in the context of relatively large threshold voltages, e.g.,  $|V_T|=V_{DD}$ , as well as lower threshold voltages.

The Advanced Communication Center - ACC - has been established at the Electrical Engineering School, Tel-Aviv University, with an initial grant from Intel Corporation. Utilizing the worldwide reputation of its researchers in communications and information technologies, and the strong industry involvement, the center will advance