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## SEMINARS

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(Fridays at 12:30 pm at BWRC unless otherwise noted)

**Location:**

Berkeley Wireless Research Center  
2108 Allston Way, Berkeley, CA 94707  
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4/20/07

**Designing Analog and RF Circuits for Ultra-low Supply Voltages**

, Peter Kinget, Columbia University, <http://www.ee.columbia.edu/~kinget>

**Abstract:** 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 a 0.5V continuous-time filter, a 0.5V continuous-time sigma-delta ADC and a 0.5V 2.4GHz RF receiver and synthesizer 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.  $|VT|=VDD$ , as well as lower threshold voltages.

**Biography:** Peter R. Kinget received the engineering degree (Summa cum Laude) in electrical and mechanical engineering and the Ph.D. (Summa cum Laude with Congratulations of the Jury) in electrical engineering from the Katholieke Universiteit Leuven, Belgium, in 1990 and 1996, respectively.

From 1996 to 1999 he was at Bell Laboratories, Lucent Technologies, in Murray Hill, NJ, as a Member of Technical Staff in the Design Principles Department. From 1999 to 2002 he held various technical and management positions in IC design and development at Broadcom, CeLight and MultiLink. In the summer of 2002 he joined the faculty of the Department of Electrical Engineering, Columbia University, NY. He is also a consultant to industry. His research interests are in analog and RF integrated circuits and signal processing. He has published over 70 papers in journals and conferences and holds 6 US patents with several applications under review.

Dr. Kinget is a Senior Member of the IEEE and Associate Editor of the IEEE Journal of Solid State Circuits (2003-).

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