



## **Terahertz and mm-Wave Signal Generation, Synthesis and Amplification: Reaching the Fundamental Limits**

**Speaker :** Prof. Omeed Momeni (University of California, Davis)

**Host :** Prof. Jianjun Zhou

**Time :** March 14, 2016, Monday 14:00pm - 16:00pm

**Venue :** Room 401, Building of Microelectronics(微电子大楼 401 会议室)

### **Abstract:**

There is a growing interest in terahertz and mm-wave systems for compact, low cost and energy efficient imaging, spectroscopy and high data rate communication. Unfortunately, today's solid-state technologies including silicon and compound semiconductors can barely cover the lower part of the terahertz band. In order to overcome this limitation, we have introduced systematic methodologies for designing circuits and components, such as signal sources and amplifiers operating close to and beyond the conventional limits of the devices. These circuit blocks can effectively generate and combine signals from multiple devices to achieve performances orders of magnitude better than the state of the art. As an example, we show the implementation of a 482 GHz oscillator with an output power of 160 W (-7.9 dBm) in 65 nm CMOS, a 300 GHz frequency synthesizer with 7.9% locking range in 90 nm SiGe, and a 260 GHz amplifier with a gain of 9.2 dB and saturated output power of -3.9 dBm in 65 nm CMOS.

### **Biography of Speaker :**

**Omeed Momeni** received the B.Sc. degree from Isfahan University of Technology, Isfahan, Iran, the M.S. degree from University of Southern California, Los Angeles, CA, and the Ph.D. degree from Cornell University, Ithaca, NY, all in Electrical Engineering, in 2002, 2006, and 2011, respectively.

He joined Electrical and Computer Engineering Department at UC Davis in 2011. He was a visiting professor in Electrical Engineering and Computer Science Department at University of California, Irvine from 2011 to 2012.



Prof. Momeni is the recipient of National Science Foundation CAREER award in 2015, the Best Ph.D. Thesis Award from the Cornell ECE Department in 2011, the Outstanding Graduate Award from Association of Professors and Scholars of Iranian Heritage (APSIH) in 2011, the Best Student Paper Award at the IEEE Workshop on Microwave Passive Circuits and Filters in 2010, the Cornell University Jacob ' s fellowship in 2007 and the NASA-JPL fellowship in 2003.