



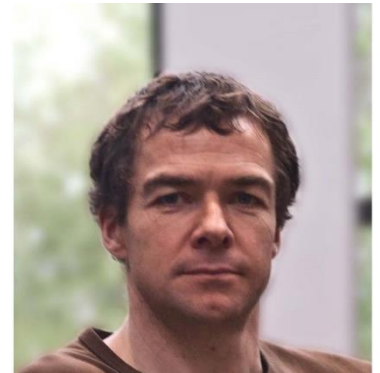
## IEEE SSCS/CASS Atlanta Joint Chapter Seminar

### Millimeter-Wave High-Data-Rate Wireless Communication Using Beamforming

**Speaker:** Dr. Piet Wambacq

**Affiliation:** IMEC, Belgium

**Abstract:** The speed increase of CMOS thanks to the downscaling in the past ten years, together with the allocation of unlicensed spectrum around 60 GHz, has given rise to much research worldwide on mm-wave IC design in CMOS. The frequency band between 57 GHz and 66 GHz is intended for high data rate wireless communication using RF bandwidths of more than 1 GHz. The commercial deployment of mm-wave ICs is taking much more time than expected, partially due to the design challenges caused by the high operating frequency, which is more than ten times higher than the commercial ICs for the most widely used wireless communication standards, which operate below 6 GHz. To relax the high path loss at mm-wave frequencies in the link budget of wireless transceivers, these transceivers contain, next to the classical functionality of radios, beamforming functionality. This talk will explain the basics of beamforming together with several implementations of the beamforming control in the analog part of the transceivers. Further, most important bottlenecks of mm-wave radio architectures such as phase noise and power efficiency are addressed and several solutions are discussed.



**Speaker Biography:** Piet Wambacq received the M.Sc. degree in electrical engineering and Ph.D. degree from the Katholieke Universiteit Leuven, Leuven, Belgium, in 1986 and 1996, respectively. Since 1996, he is with imec, Belgium, working as a Principal Scientist on CMOS design for wireless applications. Since 2000 he is also a Professor with the University of Brussels, Brussels, Belgium. He is currently a member of the program committee of the European Solid-State Circuits Conference (ESSCIRC) and he chairs the RF subcommittee of ISSCC. He is a senior member of IEEE.

**Seminar Time:** 10:30AM-11:30AM on October 11<sup>th</sup> 2017 **Seminar Location:** TSRB 509, Georgia Tech

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