RFIC Plenary Speaker 1

Prof. Bram Nauta
Distinguished Professor
University of Twente

Transceiver Roadmap for 2035 and Beyond

Abstract: During the past decades wireless communication has made an enormous growth. Triggered by a large R&D effort, the integration of transceivers in CMOS technology has made low-cost mass production possible. For many applications like Bluetooth, a single-chip CMOS transceiver can now do the job. On the other hand, for complex transceivers like in modern smartphones, still more discrete RF components such as filters, switches and diplexers are being added to protect the transceiver from strong interferers which are often produced by the device itself. To satisfy the future bandwidth hunger, the number of frequency bands will further increase, modulation schemes will become more complex, more antennas will be used and carrier aggregation will be the norm. To limit the number of discrete RF components, linearity of the transceivers is key. Since more computing power will be needed in future transceivers as well, newer CMOS technologies are also wanted. CMOS technology will scale in favor of fast-switching digital circuits, but not for classical analog functions, like amplifiers. For the next fifteen years re-thinking of basic circuits and systems will be needed to make highly integrated linear transceivers, in a technology that is designed for digital circuits.

About Prof. Bram Nauta

Prof. Bram Nauta received the M.S. and Ph.D. degrees in electrical engineering from the University of Twente, Enschede, The Netherlands in 1987 and 1991, respectively. From 1991 to 1998 he worked at the Mixed-Signal Circuits and Systems Department of Philips Research, Eindhoven, The Netherlands. In 1998 he returned to the University of Twente, where he is currently a distinguished professor and head of the IC Design group. His current research interest is high-speed analog CMOS circuits, software defined radio, cognitive radio, and beamforming. He has served as the editor-in-chief of the IEEE Journal of Solid-State Circuits, the president of the IEEE Solid-State Circuits Society, and on the technical program committees for many conferences. He is fellow of the IEEE and member of the Royal Netherlands Academy of Arts and Sciences (KNAW).

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