



Seminars Series
Talks on Electronics – 2025

a cycle of seminars on Electronics, Integrated Circuits, Radio-Frequency and related topics

Monday November 24th, 2025
14:30 – 16:30
Aula 8 - Triennio

SiGe BiCMOS Integrated Circuits and Systems for sub-THz Communication and Sensing

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Abstract – Over an 130 nm CMOS baseline, the SiGe BiCMOS process of the Leibniz Institute for High Performance Microelectronics (IHP GmbH) features various flavors of HBTs, with the fastest generation characterized by an f_t of 500 GHz and f_{max} of 700 GHz. This talk provides an overview of the research and development activities currently being carried out at the Circuit-Design Department of IHP Microelectronics in the broad areas of communication and sensing in the sub-THz bands. Applications of interest include high-datarate wireless communication, radar, sensing and spectroscopy. System architecture and silicon realization will be illustrated and discussed in details for two compete transceiver systems: a D-band four-channel transceiver frontend, suitable for ultra-wideband data transmission and capable – in one of its variants – of delivering 200 Gbps over a wireless link; a wideband 256-GHz radar transceiver chip, which is designed for integration in large MIMO arrays driven with a sub-harmonic reference in a multi-chip daisy-chain configuration. Finally, possible architectures and circuits for transmitters and receivers operating near or above the f_{max} of the technology will be presented.



Corrado Carta received the master's degree in electrical engineering from the University of Cagliari, Italy, in 2000, and the Ph.D. degree from the Swiss Federal Institute of Technology (ETH) Zurich, Switzerland, in 2006. Since 2022 he is a Professor at the Technical University of Berlin, chair of Broadband and High-Frequency Integrated Circuits, with a joint appointment as Head of the Circuit-Design Department of IHP Microelectronics, Frankfurt Oder, Germany, conducting research on a wide range of topics, including integrated mm-wave circuits and sensors.