



Topics on Microelectronics



ToM2015 - IX Year

Updated informations at the website
www.microelectronicsevents.com

In collaboration with the Microelectronics PhD Course at University of Pavia, a series of events directly addressed to researcher, designer from companies and students (Master and PhD) who want to improve their knowledge in the microelectronics field is organized. Each event consists in five long talks/lectures (of three hours each, a sufficient time to give both overview and advanced details about the topic) given by academic professors or qualified experts coming from companies or research centers. In this way the academic and industrial approaches for research and state-of-the art progress will be presented. Different topics will be addressed in each course. This is intentionally done in order to give a wide-spectrum for the audience about the present challenges in the microelectronics world.

The courses will be organized with the Italian Chapter of IEEE Solid State Circuit Society and will be held at the Electronics Department of University of Pavia (Via Ferrata, 1 - 27100 Pavia - Italia) with the following programs.

AT THE END OF EACH COURSE AN EXAM WILL BE PROPOSED FOR CERTIFYING THE POSITIVE ATTENDANCE

ToM2015/1 - May 2015

- May, 6th, 2015
14.00 - 17.30 G. Nicollini (STM), "Opamp compensation techniques - Part I"
- May, 7th, 2015
9.00 - 12.30 G. Nicollini (STM), "Opamp compensation techniques - Part II"
14.00 - 17.30 D. Haerle (Infineon), "Automotive specific circuit concept-and design requirements"
- May, 8th, 2015
9.00 - 12.30 C. Samori (Milan Politechnic), "DTC-based PLLs"
14.00 - 17.30 M.Fanciulli (UniMiB - CNR/MDM), "Emerging devices for classical, neuromorphic, and quantum information processing"

ToM2015/2 - September 2015

- September, 8th, 2015
14.00 - 17.30 M. Pasotti (STM), "Embedded Non-volatile memory design"
- September, 9th, 2015
9.00 - 12.30 A. Baschiroto (Univ. Milan Bicocca), "ADC trends in scaled technologies"
14.00 - 17.30 A. Neviani (Univ. Padova), "Impulse Radios for Short-range, Low-power Communications"
- September, 10th, 2015
9.00 - 12.30 M. Sabut, A. Nagari (STM), "Pipeline ADC, from basics to advances"
14.00 - 17.30 A. Bevilacqua (Univ. Padova), "CMOS UWB Transceivers for Short-Range Microwave Medical Imaging"

ToM Course Registration

Return this filled form to andrea.baschiroto@unimib.it within the deadline

First Name Family Name
Email: Affiliation

	Before Apr., 15 th , 2015	Before July, 20 th , 2015	Late registration	
Course 2015/1	220 €		260 €	€
Course 2015/2		220 €	260 €	€
Course 2015/1 & 2015/2	400 €			€

Payment has to be done by Bank Transfer **within the above deadline** to the bank account

Microelectronics Events - CariParma - Credit Agricole - Bank account no. 465240/48

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Lecture abstracts

ToM2015/1 - May 2015

G. Nicollini (STM) - "Opamp compensation techniques - Part I & II"

An intuitive approach, based on three simple guidelines, allows of to easily estimate amplifier pole and zero formulae without writing down a complicate set of equations. This method has been succesfully applied to many single-, two-, and three-stages CMOS amplifiers reported in literature.

D. Haerle (Infineon) "Automotive specific circuit concept- and design requirements"

The requirements of a safety-critical application in the automotive environment are very different from other applications and markets. This lecture will highlight these special requirements based on hands-on examples from concept design topics, circuit design topics to special layout topics.

C. Samori (Milan Politechnic) "DTC-based PLLs"

Digital PLLs have emerged as an interesting alternative to the charge-pump PLL architecture. One of the bottleneck of these architectures is represented by the performance - in terms of resolution and linearity - required to the TDC (time to digital converter). The use of a Digital to Time converter (DTC) in the feedback path, allows to substantially relax the TDC requirements, to fully exploit the power of digital calibration, and to achieve state-of-the art jitter-power trade-off.

M. Fanciulli (UniMiB - CNR/MDM) "Emerging devices for classical, neuromorphic, and quantum information processing"

Silicon based emerging devices for more Moore and more than Moore applications will be presented and discussed focusing on the processing and on the main physical mechanisms on which they are based.

ToM2015/2 - September 2015

M. Pasotti (STM) "Embedded Non-volatile memory design"

Motivation for Embedded Non Volatile Memory technology will be reviewed. Many eNVM concept have been introduced in different processes and for different product needs, some of this concepts will be described together with advantages and issues. eNVM requirement and specification will be analyzed, basic memory design blocks will be discussed.

A. Baschiroto (Univ. Milan Bicocca) "ADC trends in scaled technologies"

The evolution of MOS behaviour in scaled technologies modifies achievable performance and requires the development of new solution for the implementation of ADCs. The behaviour of MOS devices in scaled technologies is presented and the ADC solutions in technology nodes $\leq 32\text{nm}$ are illustrated.

A. Neviani (Univ. Padova) "Impulse Radios for Short-range, Low-power Communications"

Impulse radio (IR) allows efficient realization of short-range, low-data-rate wireless links with ultra-low power consumption. This tutorial will discuss the key factors that make IR a sensible choice for this kind of links, compare its energy efficiency with that achievable by narrow-band radios, and then address the design of fully-integrated CMOS IR transceivers. A few relevant IR design examples will be reported, including that of a 130-nm CMOS implementation of an UWB-IR transceiver operating in the 7.25-8.5 GHz band with record energy efficiency.

M. Sabut, A. Nagari (STM) "Pipeline ADC, from basics to advances"

Pipeline ADCs are very popular for the implementation of large DR devices. This lecture will propose the basic of the pipeline ADC techniques, and from the basics, some of the recent innovative pipeline ADCs will be proposed.

A. Bevilacqua (Univ. Padova) "CMOS UWB Transceivers for Short-Range Microwave Medical Imaging"

The use of microwaves for breast cancer diagnostic imaging has seen an increasing interest. CMOS integrated radar transceivers for microwave medical imaging will be addressed. Both system-level issues and innovative circuit solutions will be discussed. As a design example, a custom integrated circuit implemented in a 65-nm CMOS and operating from 2 to 16GHz with a dynamic range of 107dB will be reported, showing that the system is capable of detecting tumor targets with a resolution of 3mm.