



FIFTH SINANO SUMMER SCHOOL of DEVICE MODELLING

Bertinoro (IT)
August 28-31, 2012



Special Edition Devoted to Extreme Limits in Computation, Communication, and Sensing

The Fifth European SINANO Summer School will be held in Bertinoro (Forlì-Cesena, Italy) from 28th until 31st August 2012, co-organized by the ARCES Research Center of the University of Bologna and by the Italian Inter-University Consortium for Nanoelectronics (IUNET). The school website is: <http://sinano2012.arces.unibo.it>. The next issue of the school will present, **together with recent advances of device modeling** and characterization, contributions related to the **scaling of energy in nanoelectronics**. Since energy is dealing with the most important tasks of electronic systems such as **computation, communication, and sensing**, the analysis and the modeling of energy scaling is a fundamental issue for defining the ultimate limits offered by the technology. Similarly, energy transformation techniques are opening new challenges in understanding the limits of the devices in conversion efficiency such as in the recent field of energy harvesting.

WHO SHOULD ATTEND

The aim of the Summer School is to further enhance the knowledge of **PhD students, postdoctoral researchers and professionals** in the advanced modeling, simulation and characterization techniques amenable to conventional and novel nano-CMOS devices. It will discuss the device physics and the corresponding models, numerical techniques, programming and simulation tools, and experimental characterization techniques. PhD students can be granted 3 ECTS credits **after evaluation based upon a paper or an oral test on a theme to be agreed with the course program board**. The School will issue a **certificate** to the students that will pass the related examination, further useful for EuroDots.

COURSE LOCATION

The School will take place at the Summer School facility of the University of Bologna, located in Bertinoro, a picturesque medieval village with modern educational facilities and conveniently located in the hillside vicinity of Bologna www.centrocongressibertinoro.it.



The Centre is located in three large historical and monumental buildings not far from one another, forming a united complex on the top of the built up area of the ancient town, in a quiet and hospitable place, which is also particularly pleasant and peaceful.

FEES AND REGISTRATION

The fee for the four-days program includes lectures, accommodation for four nights in single or double room, meals and social program. One social evening will be organized for all attendees and instructors of the course. The social evening is usually held on the second day evening.

Attendants from Institutions involved in the NANOFUNCTION and STEEPER Projects are eligible for a special reduced fee (see below). **Payment deadline: June 15, 2012.** For registration and fees see: <http://sinano2012.arces.unibo.it>.

PhD students, fulfilling the requirements, **can apply for a scholarship that can cover course subscription fee, travel and accommodation costs.** All information dealing with the application for such a scholarship and the eligibility criteria can be found on <http://www.euro-dots.org/Students-rules.asp> and <http://www.euro-dots.org/Students-steps.asp>.



PROGRAM and SPEAKERS

August 28th 2012	August 29th 2012
Nanoelectronics at the limits of computation and communication	Nanoelectronics at the limits of energy conversion and sensing
Prof. Hervet Fanet, CEA LETI (FR), "Energy efficient nanoelectronics: present and future"	Prof. Alan O’Riordan, Tyndall National Institute (IE) "Nanowire sensing techniques"
Prof. Luca Gammaitoni, University of Perugia (IT) "Energy extraction from noise"	Prof. Claudio Fiegna, University of Bologna (IT), "Ultimate limits in photon energy conversion"
Prof. Victor Zhirnov, North Carolina State University (US) "Fundamental limits of charge based computing"	Prof. Arjang Hassibi, Univ. of Texas, Austin (US) "Limits of biosensing"
Prof. Marco Chiani, University of Bologna (IT) "Fundamental limits of energy in communication"	Prof. Marco Sampietro, Polytechnic of Milan (IT), "Extreme impedance sensing for nanotechnology"
	Prof. Christofer Hierold, ETH Zurich (CH), "Ultimate limits in sensing"
August 30th 2012	August 31st 2012



Advanced device modeling	Steep slope switches for energy efficient electronics (organized in collaboration with the STEEPER Project)
Prof. Sokrates Pantelides, Vanderbilt University (US) "Atomistic device simulation"	David Frank, IBM USA (US) , "System level advantages of small slope devices"
Prof. David Esseni, University of Udine (IT) , "Modeling strained silicon and alternative channel materials in CMOS technology"	Prof. Joachim Knoch, RWTH Aachen University (DE) , Tunnel FET architectures and device concepts for steep slope switches
Dr. M. Luisier, ETH (CH) , "Quantum transport"	Prof. Elena Gnani and Prof. Pierpaolo Palestri, University of Bologna, University of Udine and IUNET (IT) Semiclassical and quantum mechanical modeling of tunnel FET devices
Prof. Tibor Grasser TU Wien (AT) , "Reliability modeling for advanced CMOS devices"	
Fabio Sacconi, University of Rome, Tor Vergata (IT) , "Multiscale multiphysics simulation of sensors"	

For updated program and speakers, refer to the school website: <http://sinano2012.arces.unibo.it>

Organization & Committee

Summer School Organizers and Chairmen

- **Marco Tartagni**, ARCES/DEI University of Bologna & IUNET, Italy
- **Luca Selmi**, University of Udine & IUNET, Italy (STEEPER Session)

Steering Committee

- **Enrico Sangiorgi**, ARCES University of Bologna & IUNET, Italy
- **Asen Asenov**, University of Glasgow, Scotland UK
- **Francis Balestra**, IMEP – INPG, Grenoble, France
- **Herman Maes**, IMEC, Leuven, Belgium