



Grenoble le 8 novembre 2016

Cher Collègue,

Veillez trouver ci-joint le programme des séminaires organisés par l'IMEP-LaHC pour la période allant d'octobre à décembre 2016.

En vous remerciant de bien vouloir communiquer ce planning à vos collaborateurs, nous serons heureux de vous accueillir à nos séminaires et vous prions d'agréer, cher Collègue, nos sincères salutations.

Daniel Bauza
Responsable des séminaires

Jean Emmanuel Broquin
Directeur de l'IMEP-LAHC

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SEMINAIRE

de 13 h à 14 h, salle Belledonne, IMEP-LaHC, Bât. BCAi, Minatec,
ouvert à tous : enseignants, étudiants, chercheurs, administratifs, techniciens)

Jeudi 17 novembre 2016

“Functional Nanowire Field-Effect Transistors for Optoelectronic and Bioelectronic Applications”

by Ming-Pei LU

(National Nano Device Laboratories National Applied Research Laboratories, Taiwan)

Abstract: Nanowire (NW) semiconductors possessing high aspect ratios and significant surface effects have been proposed to serve as basic building blocks in nanoscale photosensors/ phototransistors and biosensors for next-generation multifunctional chips. In this presentation, we will introduce our research work regarding ZnO NW field-effect transistors (FETs) for phototransistor and optoelectronic memory applications firstly. The use of low-frequency current noise spectroscopy to explore the physical mechanism behind the current noise in ZnO NW photoFETs under dark and UV illumination conditions was demonstrated. Moreover, we also observed that an ultrahigh photoconductive gain ($\sim 10^{10}$) in ZnO NW photoFETs featuring strong persistent photoconductivity enabled a memory capacity for writing multibit optical data into an NW for FET for nanoscale optoelectronic memory application. In the second part, we will present our achievements regarding CMOS-compatible Si NW bioFETs for bioelectronic applications. We found that NW bioFETs with highest sensitivity were obtained when we operated the device in the subthreshold regime while applying an appropriate value of gate voltage. In the bioFET systems, the interactions between the mobile charged polymers and the immobilized molecules on the NW surface, and the effect of charge neutrality on the NW conductance were highlighted as well.

Dr. Ming-Pei Lu received his Ph.D. in Electronics Engineering from National Chiao-Tung University in Taiwan in 2006. In January 2007, he joined the National Nano Device Laboratories in Taiwan as an Associate Researcher. He is interested in functional nanomaterials for potential applications in the fields of nanoelectronics, optoelectronics and nanosensors.

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Exceptionnellement le vendredi 16 décembre 2016

“Latest Developments on SiGe BiCMOS Technologies with
“More-than-Moore” Modules for mm-wave and THz Applications
– Perspective of IHP Microelectronics”

by Mehmet KAYNAK

(IHP Microelectronics –Frankfurt (Oder) Germany)

Abstract: In the last decade, SiGe BiCMOS technologies opened a new cost-efficient market at mm-wave frequencies. Starting with the commercial use of automotive radars at 77 GHz, the market now has a strong interest on radar, sensor and imaging products at mm-wave and sub-THz frequencies. The latest improvements on SiGe HBTs with f_{max} beyond 600 GHz boost the research effort on circuits and systems area to take share from the new market. In parallel to the developments on SiGe HBT performance, “More-than-Moore” path, which covers all the additional functionalities to the standard CMOS process (i.e. MEMS devices, microfluidics, etc...), allows to realize multi-functional circuits and systems.

In this talk, the latest developments regarding the high-speed devices and circuits based on SiGe HBTs at IHP will be discussed. The “More-than-Moore” modules for multi-functional devices and circuits will also be one of the core topics of the discussion.



Dr.-Ing. M. Kaynak received his B.S degree from Electronics and Communication Engineering Department of Istanbul Technical University (ITU) in 2004, took the M.S degree from Microelectronic program of Sabanci University, Istanbul, Turkey in 2006, and received the PhD degree from Technical University of Berlin, Berlin Germany in 2014. He joined the technology group of IHP Microelectronics, Frankfurt (Oder), Germany in 2008. From 2008 to 2015, he has led the MEMS development at IHP. Since 2015, he is the department head of Technology at IHP. Dr. Kaynak is being affiliated as Adjunct Professor at Sabanci University, Turkey.