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WP3 & WP4 Domain-Workshops during the SINANO Summer School 2016

2016/06/16

During the SINANO Summer School 2015 a series of **NEREID Domain Workshops** regarding the workpackages 3 and 4 took place on **October 16-21, 2016**, in **Bertinoro (FC), Italy**

The topics were:

“Nanoscale FETs”, “Connectivity”,

“Smart Sensors”, “Smart Energy” and “Energy for Autonomous Systems”



Schedule:

Sunday 16 October 2016, 18:00: Reception

Monday to Friday 17-21, 2016:

Workshops from 9:00-18:00

(16:15 – 18:00 ONLY for NEREID experts and members)

Location

Bertinoro,
Forli-Cesena (FC),
Italy

Programme

Day 0: October 16 2016, RECEPTION and WELCOME BUFFET +

18:00 RECEPTION and WELCOME BUFFET

Day 1: Monday, October 17 2016, NEREID Workshop 1 – Task 3.1 “Nanoscale FETs” +

Organizer: Francis Balestra (Grenoble INP, FR), Anda Mocuta (IMEC, BE)

Chairman: Francis Balestra – Grenoble INP, FR

09:00-09:30 **Stephane Monfray** - IMEC (BE)
Evolution or revolution in the world of Microelectronic?
Changing times

09:30-10:00 **Maaïke Op de Beeck** - IMEC (BE)
Medical electronics for wearable and implantable
devices: system and chip requirements

10:00-10:30 **Gerard Ghibaudo** - IMEP-LAHC, GrenobleINP (FR)
Challenges in electrical characterization
of nano devices

10:30-10:45	Coffee break
10:45-11:15	Anda Mocuta - IMEC (BE) Transistor Architecture and materials
11:15-12:00	Francis Balestra - Grenoble INP (FR) Tunnel FETs trends and challenges (Slides ^[1])
12:00-13:30	Lunch break
13:30-14:00	Carlo Cagli - CEA-LETI (FR) State of the art and future challenges of memory technology
14:00-14:30	Luca Selmi - IUNET-Udine (IT) Modeling and simulation challenges for integrated nanoscale CMOS switches and CMOS compatible nanosensors
14:30-14:45	Coffee break
14:50-15:30	Claire Fenouillet- Beranger - CEA-LETI (FR) 3D Sequential integration challenges
15:30-16:10	Lars-Erik Wernersson - Lund University III-V nanowires, for digital and RF/mm Wave applications
16.15-18.00	(ONLY for NEREID experts and members)

Day 2: Tuesday, October 18 2016,
NEREID Workshop 2 – Task 3.2 “Connectivity”



Organizer:

Jean-Baptiste David/ Didier Belot (CEA-LETI, FR),

Anda Mocuta (IMEC, BE)

Chairman: Jean-Baptiste David – CEA-LETI, FR

Emilio Calvanese, LETI (FR)

"5G & Beyond Spectrum Challenges"

Leif Wilhelmsson, Ericsson (SE)

"Some key components in future Wi-Fi: IEEE 802.11ax and Wake-Up Radios"

Andrea Ghilioni, U Pavia (IT)

"Optical data communications for data-center applications in Silicon Photonics Technology"

Ian O'CONNOR, INL-Lyon (FR)

"Multi-scale optical interconnect solutions"

09:00

–

18:00

Matteo Bassi, U Pavia (IT)

"Serial link interfaces, with emphasis on the challenges of future links"

Sylvain Bourdel, Grenoble INP (FR)

"RF low power design technics"

Francois Rivet, IMS Bordeaux (FR)

"Design by Mathematics for Analog-RF"

Jose-Luis Gonzalez, LETI (FR)

"RF and mmW challenges"

(16:15 – 18:00 ONLY for NEREID experts and members)

Day 3: Wednesday, October 19 2016,
NEREID Workshop 3 – Task 4.2 "Energy for Autonomous Systems"



Organizer:

Gustavo Ardila (Grenoble INP, FR) / **Alan Mathewson** (Tyndall, IR),

David Holden (CEA LETI, FR)

**Chairmen: Gustavo Ardila - GINP France and
Alan Mawson - Tyndall Ireland**

(Free attendance for SINANO/MIGAS students)

13:15 – 13:30

Badge registration

13:30 – 13:40

Opening of the Workshop (Gustavo Ardila)

13:40 – 14:30

Stephane Monfray– STMicroelectronics,

"Innovative thermal energy harvesting for future autonomous applications"

14:30 – 15:20	Anne Kaminski-Cachopo – Grenoble INP, “Solar cells for energy harvesting ^[2] ” (Slides ^[2])
15:20 – 15:40	Break
15:40 – 16:30	Gustavo Ardila – Grenoble INP/Grenoble Alpes University, “Mechanical energy harvesting using piezoelectric materials”
16:30 – 17:20	Aldo Romani – University of Bologna, “Energy Management” (Slides ^[3])
17:20 – 17:30	Break
17:30 – 19:00	Discussion for road-mapping (ONLY for NEREID experts and members)
20.00	Dinner

Day 4: Thursday, October 20, 2016,
NEREID Workshop 4 – Task 4.2 “Smart Energy”



Organizer: Gaudenzio Meneghesso (IUNET, IT), David Holden (CEA-LETI, FR)

08:30 – 09:00	Badge registration
09:00 – 09:10	Gaudenzio Meneghesso , University of Padova “Opening of the Workshop” (Slides ^[4])
Plenary Session 1	
Mikael Östling , KTH, Royal Institute of Technology “SiC power switch device status and predictions” (Slides ^[5])	
09:10 – 10:30	Peter Moens , ON Semiconductor Belgium “Status and outlook of GaN power devices from an industry perspective” (Slides ^[6])
Giuseppe Croce , STMicroelectronics “Smart Power Technology Roadmap and Trends” (Slides ^[7])	
Thomas Detzel , Infineon, Germany “GaN in a Silicon world: Competition or Coexistence?”	
10:30 – 11:00	Break

Plenary Session 2

Joff Derluyn, EPIGAN,

“GaN from the epitaxy perspective” (Slides ^[8])

Steve Stoffels, IMEC

“Outlook for 200mm E-mode device technology” (Slides ^[9])

11:00 – 12:40

Anton Bauer, Fraunhofer IISB

“Potential of SiC for Automotive Power Electronics” (Slides ^[10])

Thomas Harder, ECPE European Center for Power Electronics,

“WBG System Integration” (Slides ^[11])

Braham Ferreira, TU Delft

“International Technology Roadmap for
Wide Band-gap Power Semiconductor ITRW” (Slides ^[12])

12:40 – 14:00

Lunch

14:00 – 17:30

Discussion for road-mapping
ONLY for NEREID experts and members
Coffee break during the discussion

20:00

Dinner (**official Speaker dinner is on Oct. 19 evening**)

Day 5: Friday, October 21, 2016, NEREID Workshop 5 – Task 4.1 “Smart Sensors”



Organizer: **Montserrat Fernandez-Bolños** – EPFL Switzerland

Chairman: **Adrian Ionescu** –EPFL Switzerland

8:30 - 9:00

Badge registration

9:00 - 9:05

Introduction and open of the workshop

9:05 - 9:45

Cosmin Roman (ETH Zürich, CH)
“Energy-efficient sensors based on carbon”

9:45 - 10:25

Denis Flandre (UCL, BE) “High-Temperature SOI CMOS devices, sensors and mixed-signal read-out circuits : Status and Roadmap”

10:25 -
10:40

Coffee break

10:40 -
11:20

Maike Taklo (SINTEF, NO) “IR and MEMS sensors” (Slides ^[13])

11:20 - **Teodor Gotszalk** (University of Wroclaw, PL) "MEMS and NEMS sensors in mass change and force metrology"
12:00

12:00 - Lunch break
13:00

13:00 - **Frans Widdershoven** (NXP semiconductors, NL)
13:40 CMOS Pixelated Capacitive Sensor platform for biosensing and many other applications ([Slides](#) ^[14])

13:40 - **Mireille Mouis** (INP, FR) "Nanonet-based field effect devices for label-free sensing"
13:55

13:55 - **Walter De Raedt** (IMEC, BE)
14:20 "Wearable and IoT sensors enabling health applications"

14.20 - Coffee break
14.30

14:30 - **Florin Udrea** (University of Cambridge, UK)
15:10 "The next generation of smart gas sensors"

15:10 - **Adrian Ionescu** and **Montserrat F.-Bolaños** (EPFL, Switzerland)
15.30

15:30 - Break
16:00

16:00 - Smart Sensor Roadmapping discussion
18:00 chaired by Cosmin Roman (ETH) and Montserrat F.-Bolaños (EPFL)

(17:45 – 19:00 ONLY for NEREID experts and members)

Organization & Committee



Summer School Organizers and Chairmen

- Susanna Reggiani, ARCES University of Bologna & IUNET, Italy
- Laurent Montes, GINP, Grenoble, France

Steering Committee

- Francis Balestra, IMEP – INPG, Grenoble, France
- Enrico Sangiorgi, ARCES University of Bologna & IUNET, Italy

Local Organizing Committee

- Roberta Ravaioli, ARCES University of Bologna & IUNET, Italy
- Michela Schiavi, CEUB Bertinoro (FC), Italy

The NEREID project (ICT-CSA-685559) is supported within the Research and Innovation Programme Horizon 2020 by the EU.

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Links:

- [1] https://www.nereid-h2020.eu/system/files/files/workshops/DWS/slides/DWS_WP31-2016-10-17_Balestra_Public.pdf
- [2] https://www.nereid-h2020.eu/system/files/files/workshops/DWS/slides/DWS_WP42-2016-10-19-02Kaminski_NEREID_public.pdf
- [3] https://www.nereid-h2020.eu/system/files/files/workshops/DWS/slides/DWS_WP42-2016-10-19-02Romani_NEREID_Public.pdf
- [4] https://www.nereid-h2020.eu/system/files/files/workshops/DWS/slides/DWS_WP42-2016-10-20_00Meneghesso_NEREID_Public.pdf
- [5] https://www.nereid-h2020.eu/system/files/files/workshops/DWS/slides/DWS_WP42-2016-10-20_01Ostling_NEREID_Public.pdf
- [6] https://www.nereid-h2020.eu/system/files/files/workshops/DWS/slides/DWS_WP42-2016-10-20_02Moens_NEREID_Public.pdf
- [7] https://www.nereid-h2020.eu/system/files/files/workshops/DWS/slides/DWS_WP42-2016-10-20_03Croce_NEREID_Public.pdf
- [8] https://www.nereid-h2020.eu/system/files/files/workshops/DWS/slides/DWS_WP42-2016-10-20_05Derluyn_NEREID_Public.pdf
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