



# 13th Spanish Conference on Electron Devices

Sevilla, Spain, 9-11 June 2021



## Final Program

8 June 2021, Tuesday

**10:00-12:30**      **PLATFORMS TESTING**

**12:30-14:00**      **MINI-COLLOQUIUM**

**12:30-13:15**

M. Lanza.

*KAUST, Saudi Arabia.*

Hexagonal boron nitride based electronic devices and circuits: status and prospects

**13:15-14:00**

E. Simoen.

*IMEC, Leuven, Belgium.*

Low-frequency noise in advanced CMOS devices

**14:00-15:30**      **Break**

**15:30-18:00**      **MINI-COLLOQUIUM**

**15:30-15:50**

L. F. Marsal.

*URV, Spain.*

Polymer Solar Cells: Advances and Challenges

**15:50-16:10**

E. Miranda.

*UAB, Spain.*

The memdiode model for RRAM devices and its application to neuromorphic computing

**16:10-16:30**

B. Iñiguez.

*URV, Spain.*

Compact Modeling of Organic and Amorphous Oxide Thin Film Transistors (TFTs) from 150K to 350K

**16:30-17:15**

I. Kymissis.

*Columbia University, NY, USA.*

Electronics on anything: How Thin Film Electronics can Instrument the World

**17:15-18:00**

H. de los Santos.

*NanoMEMS Research, Irvine CA, USA.*

Theory of Nano-Electron-Fluidic Logic (NFL): A New Digital "Electronics" Concept

9 June 2021, Wednesday

**Session We I: Materials: Processing and characterization**

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Chairperson Oral Session: *Á. L. Álvarez-Castillo (Universidad Rey Juan Carlos)*

Chairperson Poster Session: *F. Campabadal (CSIC)*

**8:45-9:00**                    **OPENING**  
Chairperson: *M. Nafria (UAB)*

**9:00-9:45**                    **INVITED TALK**

H. Riel.  
*IBM Research Europe, Zurich.*  
Towards Next Generation of Computing - Nano-Devices on Silicon

**9:45-11:00**                    **ORAL SESSION I (Materials: Processing and characterization)**

**ID-60**                    **9:45-10:00**  
D. Caudevilla<sup>1</sup>, Y. Berencén<sup>2</sup>, S. Algaidy<sup>1</sup>, F. Zenteno<sup>1</sup>, J. Olea<sup>1</sup>, E. San Andrés<sup>1</sup>, R. García-Hernansanz<sup>1</sup>, A. del Prado<sup>1</sup>, D. Pastor<sup>1</sup> and E. García-Hemme<sup>1</sup>.  
*<sup>1</sup>Universidad Complutense de Madrid, Spain, <sup>2</sup>HZDR, Dresden, Germany.*  
Overcoming the solid solubility limit of Te in Ge by ion implantation and pulsed laser melting recrystallization

**ID-24**                    **10:00-10:15**  
F. Jiménez<sup>1</sup>, H. García<sup>2</sup>, M. B. González<sup>3</sup>, S. Dueñas<sup>2</sup>, H. Castán<sup>2</sup>, E. Miranda<sup>4</sup>, F. Campabadal<sup>3</sup> and J. B. Roldán<sup>1</sup>.  
*<sup>1</sup>Universidad de Granada, Spain, <sup>2</sup>Universidad de Valladolid, Spain, <sup>3</sup>IMB-CNM (CSIC), Barcelona, Spain, <sup>4</sup>Universitat Autònoma de Barcelona, Spain.*

Fabrication, characterization and modeling of TiN/Ti/HfO<sub>2</sub>/W memristors: programming based on an external capacitor discharge

**ID-78**                    **10:15-10:30**  
J. Martín<sup>1</sup>, G. Pedreira<sup>1</sup>, P. Saraza<sup>2</sup>, J. Díaz<sup>3</sup>, R. Castro-López<sup>4</sup>, R. Rodríguez<sup>1</sup>, E. Roca<sup>2</sup>, X. Aymerich<sup>1</sup>, F. Vidal<sup>2</sup> and M. Navafria<sup>1</sup>.  
*<sup>1</sup>Universitat Autònoma de Barcelona, Spain, <sup>2</sup>IMSE-CNM, Sevilla, Spain, <sup>3</sup>IMEC, Belgium, <sup>4</sup>Nil.*  
A complete smart approach for the RTN characterization and modelling of scaled MOSFETs

**ID-89**                    **10:30-10:45 (ID:89)**  
A. L. Álvarez<sup>1</sup>, F. Borrás<sup>1</sup>, S. J. Quesada<sup>1</sup>, A. López<sup>1</sup>, A. de Andrés<sup>2</sup> and C. Coya<sup>1</sup>.  
*<sup>1</sup>Universidad Rey Juan Carlos, Madrid, Spain, <sup>2</sup>ICMM, Madrid, Spain.*  
Massive covalent functionalization of graphene by local electric-fields: a path for multianalyte biosensors

**ID-20**                    **10:45-11:00 (ID:20)**  
M. Bargalló<sup>1</sup>, M. Zabala<sup>1</sup>, K. Kalam<sup>2</sup>, A. Tamm<sup>2</sup>, F. Jiménez<sup>3</sup>, J. B. Roldán<sup>3</sup> and F. Campabadal<sup>1</sup>.  
*<sup>1</sup>IMB-CNM (CSIC), Barcelona, Spain, <sup>2</sup>University of Tartu, Estonia, <sup>3</sup>Universidad de Granada, Spain.*  
Analysis of the Characteristic Current Fluctuations in the High Resistance State of HfO<sub>2</sub>-based Memristors

**11:00-11:30**                    **Meet with friends**

### H1. MATERIALS AND PROCESSING TECHNOLOGY

- ID-12** G. López-Rodríguez<sup>1</sup>, G. Masmitjà<sup>1</sup>, I. Martín<sup>1</sup>, J. M. Moreno<sup>2</sup>, M. Rodríguez<sup>2</sup>, J. M. Quero<sup>3</sup>, J. García<sup>3</sup> and P. R. Ortega<sup>1</sup>.  
<sup>1</sup>Universitat Politècnica de Catalunya, Barcelona, Spain, <sup>2</sup>Solar MEMS Technologies S.L., Sevilla, Spain, <sup>3</sup>Universidad de Sevilla, Spain.  
Base and work vacuum pressure influence during sputtering of Al films for sun sensor applications
- ID-14** A. Torrens, G. Masmitjà, R. E. Almache, B. Pusay, E. Ros, G. López-Rodríguez, I. Martín, C. Voz, J. Puigdollers and P. R. Ortega.  
*Universitat Politècnica de Catalunya, Barcelona, Spain.*  
Atomic layer deposition of SnO<sub>2</sub> films for c-Si solar cells
- ID-15** E. San Andrés<sup>1</sup>, R. García<sup>1</sup>, E. García<sup>1</sup>, R. Barrio<sup>2</sup>, I. Torres<sup>2</sup>, D. Caudevilla<sup>1</sup>, D. Pastor<sup>1</sup>, J. Olea<sup>1</sup>, A. del Prado<sup>1</sup>, S. M. Algaidy<sup>1</sup> and F. Pérez<sup>1</sup>.  
<sup>1</sup>Universidad Complutense de Madrid, Spain, <sup>2</sup>CIEMAT, Madrid, Spain.  
High Pressure Sputtering of materials for selective contacts in emerging photovoltaic cells
- ID-56** R. Barrio.  
*CIEMAT, Madrid, Spain.*  
Light-trapping improvement of limited-quality silicon wafers for silicon heterojunction solar cell applications
- ID-73** S. Sánchez.  
*Ceit, Donostia-San Sebastián, Spain.*  
Nanosecond laser assisted chemical vapor deposition process for the growth of ZnO thin films
- ID-80** K. B. Saddik<sup>1</sup>, J. Grandal<sup>2</sup>, B. J. García<sup>1</sup> and S. Fernández-Garrido<sup>3</sup>.  
<sup>1</sup>Universidad Autónoma de Madrid, Spain, <sup>2</sup>Instituto de Sistemas Optoelectrónicos y Microtecnología, Universidad Politécnica de Madrid, Spain, <sup>3</sup>Dpto. Física Aplicada, Universidad Autónoma de Madrid, Spain.  
Chemical beam epitaxy of GaP<sub>1-x</sub>N<sub>x</sub> for the integration of III-V solar cells and light-emitting devices on Si(001)

### H3. CHARACTERIZATION AND RELIABILITY

- ID-18** A. Pacheco<sup>1</sup> and D. Jiménez<sup>2</sup>.  
<sup>1</sup>Dpto. Ingeniería Electrónica., Universitat Autònoma de Barcelona, Spain, <sup>2</sup>Universitat Autònoma de Barcelona, Spain.  
A contact resistance extraction method of 2D-FET technologies without test structures
- ID-29** M. Maestro-Izquierdo<sup>1</sup>, M. B. González<sup>1</sup>, P. Martín-Holgado<sup>2</sup>, Y. Morilla<sup>2</sup>, and F. Campabadal<sup>1</sup>.  
<sup>1</sup>IMB-CNM (CSIC), Spain, <sup>2</sup>CNA, Sevilla, Spain.  
Gamma Radiation Effects on HfO<sub>2</sub>-based RRAM Devices
- ID-32** V. M. Orejuela.  
*IES, Universidad Politécnica de Madrid, Spain.*  
Advances in the development of high efficiency III-V multijunction solar cells on Ge|Si virtual substrates
- ID-43** S. Fernández-Garrido<sup>1</sup>, C. Pisador<sup>1</sup>, J. Lähnemann<sup>2</sup>, S. Lazic<sup>3</sup>, A. Ruiz<sup>4</sup> and A. Redondo-Cubero<sup>1</sup>.  
<sup>1</sup>Dpto. Física Aplicada, Universidad Autónoma de Madrid, Spain, <sup>2</sup>Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany, <sup>3</sup>Dpto. de Física de Materiales, Universidad Autónoma de Madrid, Spain, <sup>4</sup>Instituto de Ciencia de Materiales de Madrid, CSIC, Spain.  
Coalescence, crystallographic orientation and luminescence of ZnO nanowires grown on Si(001) by chemical vapour transport

**ID-45**

A. Ruiz<sup>1</sup>, N. Seoane<sup>2</sup>, S. Claramunt<sup>1</sup>, A. J. García-Loureiro<sup>2</sup>, M. Porti<sup>1</sup> and M. Nafria<sup>1</sup>.

<sup>1</sup>Universitat Autònoma de Barcelona, Spain, <sup>2</sup>Universidad de Santiago de Compostela, Spain.

Analysis of metal gate workfunction fluctuations on MOSFETs variability using KPFM characterization and device simulation tools

**ID-51**

K. B. Saddik<sup>1</sup>, J. Lähnemann<sup>2</sup>, M. Pérez<sup>1</sup>, M. A. Pampillón<sup>1</sup>, J. Grandal<sup>3</sup>, B. J. García<sup>1</sup> and S. Fernández-Garrido<sup>4</sup>.

<sup>1</sup>Universidad Autónoma de Madrid, Spain, <sup>2</sup>Paul-Drude-Institut für Festkörperelektronik, Berlin, Germany,

<sup>3</sup>Intituto de Sistemas Optoelectrónicos y Microtecnología, Universidad Politécnica de Madrid, Spain, <sup>4</sup>Dpto. Física Aplicada, Universidad Autónoma de Madrid, Spain.

Luminescence of GaP1-xNx grown by chemical beam epitaxy: correlation with growth conditions

**ID-91**

L. Martínez-Herraiz, E. Ruiz, A. F. Braña y J.L. Plaza.

LCC, Madrid, Spain.

Effects of Surface Treatments on the Performance of CdZnTeSe Radiation Detectors

**15:00-16:30**      **PANEL DISCUSSION (Spin Off: From research to society)**

**16:30-17:00**      **Meet with friends**

**17:00-18:30**      **SOCIAL EVENT**

10 June 2021, Thursday

**Session Th II: Photovoltaic, optoelectronic and photonic devices**

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Chairperson Oral Session: J. R. Ramos-Barrado (Universidad de Málaga)

Chairperson Poster Session: J. Pallares (Universitat Rovira i Virgili)

**9:00-10:15 ORAL SESSION II (Photovoltaic, optoelectronic and photonic devices)**

- ID-9 9:00-9:15**  
A. J. García-Loureiro<sup>1</sup>, E. Fernández<sup>2</sup>, N. Seoane<sup>1</sup>, P. Rodrigo<sup>2</sup>, E. Comesaña<sup>1</sup> and F. Almonacid<sup>2</sup>.  
<sup>1</sup>Universidad de Santiago de Compostela, Spain, <sup>2</sup>Universidad de Jaén, Spain.  
High-efficiency intrinsic-Vertical-Tunnel-Junction multi-band-gap concentrator solar cells up to 15,000 suns
- ID-16 9:15-9:30**  
L. F. Marsal, J. Pallares and E. Moustafa.  
Universitat Rovira i Virgili, Tarragona, Spain.  
Influence of Spray Pyrolysis Deposition Technique on the Performance and stability of Polymer Solar Cells
- ID-27 9:30-9:45**  
E. Navarrete-Astorga<sup>1</sup>, J. Rodríguez-Moreno<sup>1</sup>, M. C. López-Escalante<sup>1</sup>, J. J. Peinado<sup>1</sup>, F. Martín<sup>1</sup>, E. Dalchiele<sup>2</sup> and J. R. Ramos-Barrado<sup>1</sup>.  
<sup>1</sup>Universidad de Málaga, Spain, <sup>2</sup>Instituto de Física, Facultad de Ingeniería de Montevideo, Uruguay.  
Flexible and transparent supercapacitors based on ZnO nanowires
- ID-46 9:45-10:00**  
C. Coya<sup>1</sup>, C. D. Redondo-Obispo<sup>1</sup>, T. Ripolles<sup>1</sup>, E. Climent-Pascual<sup>2</sup>, A. de Andrés<sup>3</sup> and A. L. Álvarez<sup>1</sup>.  
<sup>1</sup>Universidad Rey Juan Carlos, Madrid, Spain, <sup>2</sup>Universidad Politécnica de Madrid, Spain, <sup>3</sup>ICMM, Madrid, Spain.  
Influence of graphene on hybrid perovskites-based solar cells performance
- ID-63 10:00-10:15**  
D. Sánchez<sup>1</sup>, J. D. López<sup>1</sup>, M. Delgado<sup>2</sup>, R. Altuna<sup>1</sup>, C. Vázquez<sup>1</sup>, A. Fresno<sup>1</sup>, P. Contreras<sup>1</sup>, R. Rodríguez<sup>1</sup>, A. Nuñez<sup>1</sup>, I. Rey-Stolle<sup>2</sup>, M. Gabás<sup>2</sup>, M. Honojosa<sup>2</sup>, C. Algora<sup>2</sup>, I. García<sup>2</sup>, X. Barrero<sup>1</sup>, I. Lombardero<sup>2</sup>, L. Cifuentes<sup>2</sup> and J. Bautista<sup>2</sup>.  
<sup>1</sup>Universidad Carlos III de Madrid, Spain, <sup>2</sup>Instituto de Energía Solar, Universidad Politécnica de Madrid, Spain.  
Optimized Power-over-Fiber System to Remotely Feed Smart Nodes for Low-Power Consumption Applications

**10:15-11:30 POSTER SESSION II (Photovoltaic, optoelectronic and photonic devices)**

**V2. PHOTOVOLTAIC AND OPTOELECTRONIC/PHOTONICS DEVICES AND DISPLAYS**

- ID-8** C. Outes<sup>1</sup>, E. Fernández<sup>1</sup>, N. Seoane<sup>2</sup>, F. Almonacid<sup>1</sup> and A. J. García-Loureiro<sup>2</sup>.  
<sup>1</sup>Universidad de Jaén, Spain, <sup>2</sup>Universidad de Santiago de Compostela, Spain.  
Study of Recombination Effects in a Vertical-Tunnel-Junction GaAs Solar Cell
- ID-11** A. A. Torim tubun, J. Pallares and L. F. Marsal.  
Universitat Rovira i Virgili, Tarragona, Spain.  
Effect of Thermal Annealing on the Performance of PTB7-Th:PC70BM-Based Ternary Organic Solar Cells

- ID-13** J. Olea, S. Algaidy, D. Caudevilla, E. García-Hemme, A. del Prado, D. Pastor, R. García-Hernansanz, F. Zenteno, E. San-Andrés, G. González-Díaz, I. Mártil, D. Montero, P. Gomez, J. Gonzalo, and J. Siegel.  
*Universidad Complutense de Madrid, Spain.*  
Advances on GaP:Ti material and solar cells
- ID-30** M. Fisse<sup>1</sup>, L. López<sup>1</sup>, L. Yedra<sup>1</sup>, F. Peiró<sup>1</sup>, S. Estradé<sup>1</sup>, S. Paetel<sup>2</sup>, R. Fonoll-Rubio<sup>3</sup>, M. Guc<sup>3</sup> and V. Izquierdo-Roca<sup>3</sup>.  
<sup>1</sup>*Universitat de Barcelona, Spain,* <sup>2</sup>*Zentrum für Sonnenenergie und Wasserstoff-Forschung, Stuttgart, Germany,*  
<sup>3</sup>*Institut de Recerca en Energia de Catalunya, Barcelona, Spain.*  
Characterization of thin CIGS solar cells by electron microscopy techniques
- ID-38** G. López-Rodríguez, E. Ros, P. R. Ortega, C. Voz, J. Puigdollers and I. Martín.  
*Universitat Politècnica de Catalunya, Barcelona, Spain.*  
Thin c-Si Solar Cells Based on VOx Heterojunctions
- ID-47** S. Algaidy<sup>1</sup>, J. Olea<sup>1</sup>, D. Caudevilla<sup>1</sup>, E. García-Hemme<sup>1</sup>, A. del Prado<sup>1</sup>, D. Pastor<sup>1</sup>, D. Montero<sup>1</sup>, R. García-Hernansanz<sup>1</sup>, E. San Andrés<sup>1</sup>, G. González-Díaz<sup>1</sup>, I. Mártil<sup>1</sup>, J. Siegel<sup>2</sup>, J. Gonzalo<sup>2</sup>, M. Wang<sup>3</sup> and Y. Berencén<sup>3</sup>.  
<sup>1</sup>*Universidad Complutense de Madrid, Spain,* <sup>2</sup>*IO-CSIC, Madrid, Spain,* <sup>3</sup>*Helmholtz-Zentrum Dresden-Rossendorf, Dresden, Germany.*  
Recrystallization of GaAs supersaturated with Ti
- ID-52** L. K. Acosta, J. Ferre-Borrull and L. F. Marsal.  
*Universitat Rovira i Virgili, Tarragona, Spain.*  
Progress in Engineering Photonic Structures based on Nanoporous Anodic Alumina
- ID-55** I. Torres.  
*CIEMAT, Madrid, Spain.*  
Silicon heterojunction solar cells with Graphene-modified front transparent conductive electrodes
- ID-57** R. Barrio.  
*CIEMAT, Madrid, Spain.*  
Laser Fired Contacts in multicrystalline silicon solar cells
- ID-61** L. F. Marsal<sup>1</sup> and J. G. Sánchez<sup>2</sup>.  
<sup>1</sup>*Universitat Rovira i Virgili, Tarragona, Spain,* <sup>2</sup>*CIQ, Tarragona, Spain.*  
Bulk-Heterojunction Organic Solar Cells Towards 20% of Power Conversion Efficiency
- ID-64** E. García, D. Caudevilla, S. M. Algaidy, F. Pérez, R. García, J. Olea, D. Pastor, A. del Prado, E. San Andrés, I. Mártil and G. González.  
*Universidad Complutense de Madrid, Spain.*  
Unveiling the optoelectronic mechanisms ruling Ti hyperdoped Si photodiodes
- ID-66** E. López-Aymerich.  
*Universitat de Barcelona, Spain.*  
Simulations and nanofabrication of photonic crystals based on silicon pillars for mechanical biosensors
- ID-74** S. González-Torres.  
*Universitat de Barcelona, Spain.*  
Inkjet-printed ZnO and NiOx: layer and device characterization for optoelectronics
- ID-81** R. Izquierdo-López, J. Pedrós, R. Fandan, A. Boscá and F. Calle.  
*Instituto de Sistemas Optoelectrónicos y Microtecnología, Dpto. de Ingeniería Electrónica, Universidad Politécnica de Madrid, Spain.*  
SAW-driven plasmons in graphene heterostructures for fingerprinting ultrathin polymer layers

- ID-87** B. Galiana<sup>1</sup>, R. de la Cruz<sup>1</sup>, M. Modesto<sup>1</sup>, C. Kanvinda-Malu<sup>2</sup>, S. Athanasopoulos<sup>1</sup>, E. Salas<sup>1</sup>, E. García-Tabarés<sup>1</sup>, B. García<sup>1</sup> and J. E. Muños<sup>1</sup>.  
<sup>1</sup>Universidad Carlos III de Madrid, Spain, <sup>2</sup>Universidad Rey Juan Carlos, Madrid, Spain.  
Improvement of III-V solar cells by using oxides doped with rare earths

## V1. SENSORS, ACTUATORS AND MICRO/NANO SYSTEMS

- ID-25** C. Reig<sup>1</sup>, F. Pardo<sup>1</sup>, J. A. Boluda<sup>1</sup>, F. Vegara<sup>1</sup>, M. D. Cubells<sup>1</sup>, J. Sanchis<sup>1</sup>, S. Abrunhosa<sup>2</sup> and S. Cardoso<sup>2</sup>.  
<sup>1</sup>Universidad de Valencia, Spain, <sup>2</sup>INESC-Microsystems and Nanotechnologies, Lisbon, Portugal.  
Advanced Giant Magnetoresistance (GMR) sensors for Selective-Change Driven (SCD) circuits

**11:30-12:00** *Meet with friends*

## Session Th III: Device modelling, simulation and beyond

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*Chairperson Oral Session: A. García-Loureiro (Universidad de Santiago de Compostela)*

*Chairperson Poster Session: S. Dueñas (Universidad de Valladolid)*

**12:00-13:15** *POSTER SESSION III (Device modelling, simulation and beyond)*

## H2. DEVICE MODELLING AND SIMULATION

- ID-3** A. E. Atamuratov<sup>1</sup>, B. O. Jabbarova<sup>1</sup>, M. M. Khalilloev<sup>1</sup>, A. Yusupov<sup>2</sup> and A. G. J. Loureiro<sup>3</sup>.  
<sup>1</sup>Urgench State University, Uzbekistan, <sup>2</sup>Tashkent University of Information Technologies, Uzbekistan, <sup>3</sup>Universidad de Santiago de Compostela, Spain.  
Self-heating effect in nanoscale SOI Junctionless FinFET with different geometries
- ID-7** A. J. Pérez-Ávila<sup>1</sup>, E. Pérez<sup>2</sup>, J. B. Roldán<sup>1</sup> and C. Wenger<sup>2</sup> and F. Jiménez<sup>1</sup>.  
<sup>1</sup>Universidad de Granada, Spain, <sup>2</sup>IHP.  
Multilevel memristor based matrix-vector multiplication: influence of the discretization method
- ID-19** F. Pasadas<sup>1</sup>, T. Grou<sup>2</sup>, A. Medina-Rull<sup>3</sup>, M. Najari<sup>4</sup>, E. G. Marin<sup>3</sup>, A. Toral-López<sup>3</sup>, M. C. Pardo<sup>3</sup>, F. J. G. Ruiz<sup>3</sup>, A. Godoy<sup>3</sup>, L. Elmir<sup>2</sup> and D. Jiménez<sup>1</sup>.  
<sup>1</sup>Universitat Autònoma de Barcelona, Spain, <sup>2</sup>GEEE, <sup>3</sup>Universidad de Granada, Spain, <sup>4</sup>Jazan University, Saudi Arabia.  
Modeling of ion-sensitive FETs based on 2D-TMDs
- ID-31** A. Valera.  
*Universidad de Jaén, Spain.*  
Modelling and potential of hybrid micro-scaling MJ solar cell and thermoelectric generator
- ID-37** C. Santa Cruz<sup>1</sup>, G. Vinuesa<sup>1</sup>, O. G. Osorio<sup>1</sup>, H. García<sup>1</sup>, B. Sahelices<sup>1</sup>, H. Castán<sup>1</sup>, S. Dueñas<sup>1</sup>, J. Jiménez<sup>1</sup>, M. Bargalló<sup>2</sup> and F. Campabadal<sup>2</sup>.  
<sup>1</sup>Universidad de Valladolid, Spain, <sup>2</sup>IMB-CNM (CSIC), Barcelona, Spain.  
Semiempirical Memdiode Model for Resistive Switching Devices in Dynamic Regimes
- ID-40** N. Mavredakis<sup>1</sup>, A. Pacheco<sup>2</sup>, P. C. Feijoo<sup>1</sup> and D. Jiménez<sup>1</sup>.  
<sup>1</sup>Universitat Autònoma de Barcelona, Spain, <sup>2</sup>Dpto. Ingeniería Electrónica, Universitat Autònoma de Barcelona, Spain.  
Analysis of traps-related effects hindering GFETs performance

- ID-53** J. Cuesta-Lopez, A. Toral-Lopez, M. C. Pardo, E. G. Marin, F. G. Ruiz, F. Pasadas and A. Godoy.  
*Universidad de Granada, Spain.*  
Variability assessment of the performance of MoS<sub>2</sub> based BioFETs
- ID-65** P. C. Feijoo<sup>1</sup>, F. Pasadas<sup>1</sup>, A. Pacheco<sup>2</sup>, F. Alveiro<sup>1</sup> and D. Jiménez<sup>1</sup>.  
<sup>1</sup>*Universitat Autònoma de Barcelona, Spain,* <sup>2</sup>*Dpto. Ingeniería Electrónica, Universitat Autònoma de Barcelona, Spain.*  
Impact of Self-Heating on Small-Signal Parameters of Graphene Field-Effect Transistors over a Wide Frequency Range
- ID-76** F. A. Chaves, P. C. Feijoo and D. Jiménez.  
*Universitat Autònoma de Barcelona, Spain.*  
Electrically and Chemically Doped 2D lateral pn junctions: Equilibrium and out-of-the equilibrium properties
- ID-90** J. J. Santaella<sup>1</sup>, F. M. Gómez-Campos<sup>2</sup>, S. Rodríguez-Bolívar<sup>2</sup> and K. Critchley<sup>3</sup>.  
<sup>1</sup>*VALEO, Paris, France,* <sup>2</sup>*Universidad de Granada, Spain,* <sup>3</sup>*University of Leeds, United Kingdom.*  
Electrical simulation of a QLED device based on quantum dots using the Transfer Hamiltonian approach

#### **V4. NEW DEVICE CONCEPTS: QUANTUM DEVICES, NANO-DEVICES, RF, MICROWAVE AND POWER DEVICES**

- ID-2** G. González<sup>1</sup>, M. Bargalló<sup>2</sup>, F. Jiménez<sup>1</sup>, F. Campabadal<sup>2</sup> and J. B. Roldán<sup>1</sup>.  
<sup>1</sup>*Universidad de Granada, Spain,* <sup>2</sup>*IMB-CNM (CSIC), Barcelona, Spain.*  
RTN study of TiN/Ti/HfO<sub>2</sub>/Pt resistive switching devices based on neural network analysis
- ID-10** J. G. Fernández<sup>1</sup>, N. Seoane<sup>1</sup>, K. Kalna<sup>2</sup> and A. J. García-Loureiro<sup>1</sup>.  
<sup>1</sup>*Universidad de Santiago de Compostela, Spain,* <sup>2</sup>*Swansea University, United Kingdom.*  
Threshold voltage variability study in a 12 nm gate length Nanosheet FET
- ID-22** M. Saludes-Tapia<sup>1</sup>, S. Poblador<sup>1</sup>, F. Campabadal<sup>2</sup>, J. Suñé<sup>1</sup>, E. Miranda<sup>1</sup> and M. Bargalló<sup>2</sup>.  
<sup>1</sup>*Universitat Autònoma de Barcelona, Spain,* <sup>2</sup>*IMB-CNM (CSIC), Barcelona, Spain.*  
Complementary Resistive Switching in Anti-Serially Connected HfO<sub>2</sub>-based Memristors
- ID-33** J. Martínez  
*ISOM, Universidad Politécnica de Madrid, Spain.*  
Towards a hybrid graphene device for Green Energy
- ID-59** G. Paz<sup>1</sup>, I. Íñiguez de la Torre<sup>1</sup>, H. Sánchez<sup>1</sup>, V. Hoel<sup>2</sup>, Y. Cordier<sup>2</sup>, T. González<sup>1</sup> and J. Mateos<sup>1</sup>.  
<sup>1</sup>*Universidad de Salamanca, Spain,* <sup>2</sup>*IEMN, France.*  
GaN-based HEMTs operating as zero-bias microwave detectors at low temperature
- ID-84** F. M. Gómez-Campos.  
*Universidad de Granada, Spain.*  
Influence of dimensionality and stoichiometry in the electronic structure of InAs quantum dot solids

#### **15:00-15:45      INVITED TALK**

- Y. Chen.  
*Duke University, U.S.A.*  
Hardware/Software Co-design for AI Systems



**15:45-17:00**

**ORAL SESSION III (Device modelling, simulation and beyond)**

**ID-28**

**15:45-16:00**

E. Pérez-Martín<sup>1</sup>, I. Íñiguez de la Torre<sup>1</sup>, T. González<sup>1</sup>, C. Gaquiere<sup>2</sup> and J. Mateos<sup>1</sup>.

<sup>1</sup>Universidad de Salamanca, Spain, <sup>2</sup>IEMN, France.

Bias-dependence of surface charge at low temperature in GaN nano-diodes

**ID-26**

**16:00-16:15**

B. Orfao E Vale.

Universidad de Salamanca, Spain.

Technological Parameters and Edge Fringing Capacitance in GaN Schottky Barrier Diodes: Monte Carlo Simulations

**ID-39**

**16:15-16:30**

F. Pasadas<sup>1</sup>, A. Pacheco<sup>2</sup>, A. Mansouri<sup>3</sup>, P. Kumar<sup>4</sup>, G. Calabrese<sup>4</sup>, K. Patel<sup>4</sup>, A. Zurutuza<sup>5</sup>, O. Habibpour<sup>3</sup>, H. Zirath<sup>3</sup>, R. Sordan<sup>4</sup> and D. Jiménez<sup>1</sup>.

<sup>1</sup>Universitat Autònoma de Barcelona, Spain, <sup>2</sup>Dpto. Ingeniería Electrónica, Universitat Autònoma de Barcelona, Spain, <sup>3</sup>CUT, <sup>4</sup>POLIMI, Italy, <sup>5</sup>Graphenea, Gipuzkoa, Spain.

Towards the experimental demonstration of non-quasi-static effects in graphene field-effect transistors

**ID-72**

**16:30-16:45**

M. M. Al Chawa<sup>1</sup>, R. Tetzlaff<sup>2</sup>, S. Stavrinides<sup>3</sup>, C. de Benito<sup>4</sup> and R. Picos<sup>4</sup>.

<sup>1</sup>Technische Universität Dresden, Germany, <sup>2</sup>Nil, <sup>3</sup>International Hellenic University, Greece, <sup>4</sup>Universitat de les Illes Balears, Spain.

Energy Based Analysis of Reset Transition in ReRAM Memristive Devices

**ID-75**

**16:45-17:00**

E. Salvador<sup>1</sup>, M.B. Gonzalez<sup>2</sup>, F. Campabadal<sup>2</sup>, J. Martin-Martinez<sup>1</sup>, R. Rodriguez<sup>1</sup> and E. Miranda<sup>1</sup>.

<sup>1</sup>Dpto. de Ingeniería Electrónica, Universitat Autònoma de Barcelona, Spain, <sup>2</sup>IMB-CNM (CSIC), Barcelona, Spain.

In-depth Analysis of the Statistical Distribution of RRAM Electrical Parameters Intended for Compact Modeling

11 June 2021, Friday

**Session Fr IV: Sensors, actuators and biomedical devices**

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Chairperson Oral Session: C. Aracil (Universidad de Sevilla)

Chairperson Poster Session: C. García Núñez (University of the West of Scotland)

**9:00-9:45**                      **INVITED TALK**

M. Dominguez-Pumar.

*Universitat Politècnica de Catalunya, Spain.*

Mars 2020: the third NASA mission with Spanish wind sensing technology in Mars

**9:45-11:00**                      **ORAL SESSION IV (Sensors, actuators and biomedical devices)**

**ID-62**

**9:45-10:00**

M. Rovira<sup>1</sup>, C. Fernández-Sánchez<sup>1</sup>, S. Demuru<sup>2</sup>, B. P. Kunnel<sup>2</sup>, D. Briand<sup>2</sup> and C. Jiménez-Jorquera<sup>1</sup>.

<sup>1</sup>IMB-CNM (CSIC), Barcelona, Spain, <sup>2</sup>EPFL, Switzerland.

Paper-based wearable patch for sweat biomonitoring

**ID-50**

**10:00-10:15**

M. Moreno<sup>1</sup>, V. Parra-Monreal<sup>2</sup>, M. Ortega-Machuca<sup>2</sup>, J. Ramón-Azcon<sup>2</sup>, W. Svendsen<sup>3</sup> and A. Romano-Rodríguez<sup>1</sup>.

<sup>1</sup>Universitat de Barcelona, Spain, <sup>2</sup>IBEC, Barcelona, Spain, <sup>3</sup>Technical University of Denmark-DTU, Denmark.

Detection of cytokines in skeletal muscle tissue using optical SPR sensing platform

**ID-41**

**10:15-10:30**

A. Peña<sup>1</sup>, D. Matatagui<sup>2</sup>, C. Cruz<sup>2</sup>, P. de la Presa<sup>1</sup>, P. Marín<sup>1</sup> and C. Horrillo<sup>2</sup>.

<sup>1</sup>Instituto de Magnetismo Aplicado, Madrid, <sup>2</sup>Instituto de Tecnologías Físicas y de la Información, CSIC, Madrid, Spain.

Study of magnetoelastic resonance for chemical sensors: Ribbons vs microwires

**ID-70**

**10:30-10:45**

I. Sayago<sup>1</sup>, C. Sánchez<sup>2</sup>, J. L. Sanjurjo<sup>1</sup>, J. P. Santos<sup>1</sup>, S. Ogilvie<sup>3</sup>, H. J. Wood<sup>3</sup>, A. Graf<sup>3</sup>, M. Large<sup>3</sup>, A. B. Dalton<sup>3</sup>, R. Garriga<sup>4</sup> and E. Muñoz<sup>5</sup>.

<sup>1</sup>ITEF-CSIC, Madrid, Spain, <sup>2</sup>Up Devices and Technologies, Madrid, Spain, <sup>3</sup>University of Sussex, United Kingdom, <sup>4</sup>Universidad de Zaragoza, Spain, <sup>5</sup>Instituto de Carboquímica ICB-CSIC, Zaragoza, Spain.

Resistive gas sensors based on MoS<sub>2</sub> nanosheets with high response to low NO<sub>2</sub> concentrations

**ID-68**

**10:45-11:00**

A. Alcacer<sup>1</sup>, H. Ben Halima<sup>2</sup>, A. Errachid<sup>2</sup> and J. Bausells<sup>1</sup>.

<sup>1</sup>IMB-CNM (CSIC), Barcelona, Spain, <sup>2</sup>Institute of Analytical Sciences (UCBL), France.

eHealth system with ISFET-based immunosensor for heart failure biomarker detection in saliva

**11:00-11:30**                      **Meet with friends**

**VI. SENSORS, ACTUATORS AND MICRO/NANO SYSTEMS**

- ID-4** J. M. Moreno<sup>1</sup>, M. Rodríguez<sup>1</sup>, P. R. Ortega<sup>2</sup> and J. M. Quero<sup>3</sup>.  
<sup>1</sup>Solar MEMS Technologies S.L., Sevilla, Spain, <sup>2</sup>Universitat Politècnica de Catalunya, Barcelona, Spain, <sup>3</sup>Universidad de Sevilla, Spain.  
In orbit data of miniaturized 2-axis sun sensors for attitude control applications in spacecrafts
- ID-6** A. Rodríguez, D. Vega, D. Cardador and D. Segura.  
Universitat Politècnica de Catalunya, Spain.  
Study of the performance impact by fabrication imperfections in electrochemically etched macroporous silicon photonic crystals
- ID-17** M. Tomić, I. Gràcia, E. Figueras, C. Cané and S. Vallejos.  
IMB-CNM (CSIC), Barcelona, Spain.  
ZnO nanorods and their modification with Au nanoparticles for UV-light activated gas sensing
- ID-36** O. Ferrer.  
IMB-CNM (CSIC), Barcelona, Spain.  
3D Detectors for timing applications
- ID-42** M. Pelayo<sup>1</sup>, K. McAughey<sup>2</sup>, D. Gibson<sup>1</sup>, D. Hughes<sup>2</sup> and C. García<sup>1</sup>.  
<sup>1</sup>University of the West of Scotland, United Kingdom, <sup>2</sup>Novosound, Scotland, United Kingdom.  
Glancing Angle Deposition of Nanostructured ZnO Thin Films for Ultrasonics
- ID-44** C. Pérez-González.  
Universidad de Valladolid, Spain.  
Development of a potentiometric bioelectronic tongue modified with gold nanoparticles for dairy industry
- ID-54** J. Gómez-Suárez, F. Meléndez, P. Arroyo, S. Rodríguez, S. Palomeque, J. I. Suárez and J. Lozano.  
Universidad de Extremadura, Spain.  
Detection of 2,4,6 Trichloroanisole at low concentrations by means of machine olfaction
- ID-58** M. Pozo-Gómez, J. D. Aguilera-Martín, P. de la Presa, C. Cruz, P. Marín, M. C. Horrillo and D. Matatagui.  
Instituto de Tecnologías Físicas y de Información, CSIC, Madrid, Spain.  
Modeling and simulation of a magnonic gas sensor to detect diseases in human breath
- ID-67** C. Sánchez<sup>1</sup>, J. P. Santos<sup>2</sup>, A. Azabal<sup>1</sup>, S. Ruiz-Valdepeñas<sup>1</sup>, J. Lozano<sup>3</sup>, I. Sayago<sup>2</sup> and J. L. San Jurjo<sup>2</sup>.  
<sup>1</sup>Up Devices and Technologies, Madrid, Spain, <sup>2</sup>ITEF-CSIC, Madrid, Spain, <sup>3</sup>Universidad de Extremadura, Spain.  
Automation and optimization device for the fabrication of sensors with nanomaterials
- ID-71** A. Doblas.  
IMB-CNM (CSIC), Barcelona, Spain.  
Technology Developments on iLGAD Sensors at IMB-CNM
- ID-77** D. Estrada<sup>1</sup>, M. Dolcet<sup>1</sup>, R. Soriano<sup>1</sup>, J. Santander<sup>1</sup>, M. Salleras<sup>1</sup>, L. Fonseca<sup>1</sup>, J. M. Sojo<sup>2</sup>, A. Morata<sup>2</sup> and A. Tarancon<sup>2</sup>.  
<sup>1</sup>IMB-CNM (CSIC), Barcelona, Spain, <sup>2</sup>IREC, Ciudad Real, Spain.  
Highly-packed arrangement of an all-Si based thermoelectric microgenerator
- ID-82** A. Doblas.  
IMB-CNM (CSIC), Barcelona, Spain.  
Proton Low Gain Avalanche Detector (pLGAD) for Low Energy Particles Detection

**ID-83** C. Iain Douglas, C. García Núñez, D. Gibson and M. Caffio.  
*University of the West of Scotland, United Kingdom.*  
Development of a Highly Sensitive and Flexible Graphene Foam Based Pressure Sensors

### **V3. BIOMEDICAL DEVICES AND LAB-ON-CHIP**

**ID-69** L. Lefaix<sup>1</sup>, A. Blanquer<sup>2</sup>, L. Bacakova<sup>2</sup>, J. Esteve<sup>1</sup> and G. Murillo<sup>1</sup>.  
<sup>1</sup>*IMB-CNM (CSIC), Barcelona, Spain, <sup>2</sup>Institute of Physiology of the Czech Academy of Sciences, Prague, Czech Republic.*  
Development of hybrid piezoelectric microdevices for bioapplications

**ID-86** J. A. Fontanilla and A. Luque.  
*Universidad de Sevilla, Spain.*  
Low-cost voltage amplifier for biological signal acquisition through generic micro-electrode array

**ID-88** C. Aracil, J. D. Urbano-Gómez, F. Perdignes, J. A. Fontanilla and J. M. Quero.  
*Universidad de Sevilla, Spain.*  
Towards a 3D-Printed and Autonomous Culture Platform Integrated with Commercial Microelectrode Arrays

**13:15-13:30**

### **CLOSING**

*Chairperson: M. Nafría (UAB)*