14th Spanish Conference on Electronic Devices

València, 6-8 June 2023

CDE 2023

València

June, 6th to 8th

Program

https://congresos.adeituv.es/CDE2023/

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GENERAL INFORMATION

About CDE 2023

During 25 years, the Spanish Conference on Electron Devices (CDE) has served as the main venue for the presentation and discussion of current and emerging electron devices and technologies developed by Spanish research groups. In 2023, CDE will be held in Valencia, from 6th to 8th of June, following the successful events in Seville (2021), Salamanca (2018), Barcelona (2017), Aranjuez (2015), Valladolid (2013), Palma de Mallorca (2011), Santiago de Compostela (2009), El Escorial (2007), Tarragona (2005), Calella de la Costa (2003), Granada (2001), Madrid (1999) and Barcelona (1997).

Conference topics

The aim of the conference is to review the advances in the field of electronic devices, according to the following topics:

Horizontal topics (techniques and processes)

H1. Materials and processing technology

Manufacturing techniques for bulk or 2D layered materials (LPE, MBE, MOVPE, CVD, ALD ...). Development of semiconductor materials: carbon-based materials: graphene, CNT, fibers... New organic semiconductors. Technological processes and their simulation: bulk substrates treatment, photolithography, e-beam lithography, etching, FIB, diffusion, ion implantation, insulator and metal deposition, ohmic contacts, etc. Ink-jet, 3D, and other new printing techniques for electronic devices.

H2. Device modelling and simulation

Statistical, numerical or analytical models for electronic, optical, or physical device aspects. Physical and circuital device models and their interconnection.

H3. Characterization and reliability

Physical and chemical characterization of electronic materials: SIMS, XPS, photoluminescence, Hall effect, XRD, SEM, TEM, STM, AFM, AES, RBS, etc. Electrical and optical device characterization: quantum efficiency, I-V, C-V, impedance, TLM, etc. Device reliability, fault analysis, electromigration, real-time and fast degradation experiments, etc.

VERTICAL TOPICS (DEVICE TYPES)

V1. Sensors, actuators, and micro/nano systems

Structures and their integration into devices for sensors, actuators, micro/nanosystems, and MEMS/NEMS. It includes sensors for physical, chemical, gas, electrochemical, mass ... detection. Integrated sensors. Hybrid integration with optical components. Energy harvesting. Electronic noses.

V2. Photovoltaic and optoelectronic/photonics devices and displays

Single crystal technologies (Si, III-V), thin film technologies (chalcogenides, a-Si, perovskites...), organic PV, third generation-based concepts. Optoelectronic devices: LEDs, lasers, optical modulators, photodiodes, CMOS, or CCD array detectors. Photonic Crystals structures. Displays: TFT, LCD, OLEDs...

V3. Biomedical devices and Lab-on-Chip

Sensors for biomedical detection. SPR. DNA chips. Micro-optofluidics. Micro- and nano separation technologies. Micro- and nano total analysis systems (uTAS, nTAS). Biological fuel-cells. Implantable medical devices and drug delivery devices. Medical diagnostic microsystem. Bioelectronics applications.

V4. New device concepts: quantum devices, nano-devices, RF, microwave and power devices

New functional devices based on nanostructures: nanotubes, nanowires, quantum dots, graphene, etc. Magnetic, nano-photonic, spintronic, and molecular devices. Memristive switching devices. Devices for micro-energy harvesting. Terahertz operating devices. Discrete and integrated devices for high power/voltage/current operation, including FETs, HBTs for high power, RF, microwave and integrated switches, capacitors, inductors, and components for batteries.

SS. Special session: Memristors

Memristors, or memory resistors, are a type of electronic device that can store and process information in a way that mimics the synaptic behavior of the human brain. As such, memristors hold great potential for revolutionizing computing and artificial intelligence. Over the past few years, there have been significant advances in the development of memristor-based technologies, from novel materials and fabrication techniques to applications in neuromorphic computing, analog computing, and beyond. In this session, we will hear from leading researchers in the field about the latest breakthroughs in memristor science and engineering, and explore the exciting possibilities that lie ahead.

PRESENTATIONS

All accepted contributions included in the program are expected to be presented by one of their authors during the conference. Two types of presentations will be scheduled: oral and poster sessions.

Oral sessions

Oral presentations will last 15 minutes plus 5 minutes for questions.

Poster sessions

Poster sessions will be held in a dedicated room.

AWARDS

Two types of prizes will be awarded during the conference: Best papers, and PhD competition.

Best papers awards

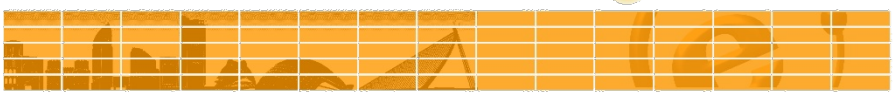
The best presentations at each session (oral and poster) will be awarded. The winners will be announced during the closing ceremony and a prize will be handed out to them

Sponsors and acknowledgments

(pending)

14th Spanish Conference on Electronic Devices

València, 6-8 June 2023



CONFERENCE PROGRAM

June 5th, Monday

IEEE EDS Mini-Colloquium

(Organized by the IEEE EDS Spain Chapter)

14:10–14:15	**Opening** Welcome by the EDS Spain Chapter
14:15–15:00	75th Anniversary of the transistor: semiconductor industry perspective *Prof. Fernado Guarin* Senior Past President Electron Devices Society (EDS)
15:00–15:45	Ultra low power sensor interfaces for IoT *Prof. Arokia Nathan* Darwin College, University of Cambridge
15:45–16:30	Smart multifunctional electronic devices with atypical architecture for IoT applications *Prof. Nazek El-Atab* King Abdullah University of Science and Technology, Saudi Arabia
16:30–17:00	Coffee break
17:00–17:45	Advanced nanoelectronics metrology *Prof. Mario Lanza* King Abdullah University of Science and Technology, Saudi Arabia
17:45–18:30	Invention that made profound changes to humanity: Transistor and its evolution enabling digital ecosystem *Prof. Samar Saha* Prospicient Devices / Santa Clara University, USA

June 6th, Tuesday

8:30–9:00 Opening

Welcome

9:00–9:45 Invited talk

Prof. Samar Saha
Prospicient Devices / Santa Clara University, USA

An overview of FinFET devices and non-planar CMOS device technology

10:00–10:45 Invited talk

Prof. Arokia Nathan
Darwin College, University of Cambridge

Low-power flexible electronics

11:00–11:30	Coffee break

	Session: **Sensors (I)** Session Chair: *Joan Bausells*
11:30–11:45	Multi-arrays of 3D-cylindrical microdetectors for medical applications *Consuelo Guardiola* (IMB-CNM)
11:50–12:05	AlN piezoelectric micromachined ultrasonic transducers (PMUTs) as proximity sensors *Eyglis Ledesma* (UAB)
12:10–12:25	Radiation effects in silicon carbide radiation detectors *Joan Marc Rafí* (IMB-CNM)

	Session: **Photovoltaic (I)** Session Chair: *Lluís Marsal*
12:30–12:45	Flexible and lightweight III-V multijunction solar cells for high power density applications *Carlos Algora* (UPM)
12:50–13:05	Selective growth of $MAPbBr_3$ perovskite on micro-patterned graphene oxide/graphene structures *Javier Bartolomé* (URJC)
13:10–13:25	Impact of proton irradiation on TMO-based solar cells *Sebastian Duarte* (UPM)

13:30–15:00	Lunch

	Session: **Characterization** Session Chair: *Elena Navarrete-Astorga*
15:00–15:15	Probing conductive filament self-heating in RRAM devices by nanoscale spatially resolved device thermometry *Miguel Muñoz Rojo* (IMN-CNM)

15:20–15:35	Extrinsic mobility degradation extraction in GFETs for technologies benchmarking *Anibal Pacheco-Sanchez* (UAB)
15:40–15:55	Development of dedicated characterization techniques for fabrication of 3D Microelectrode Arrays *João Serra* (IST, Lisbon)

	Session: **Modeling** Session Chair: *Tomás González*
16:00–16:15	Modeling of graphene field-effect ion-sensors *Francisco Pasadas* (UGr)
16:20–16:35	Recombination time in drift-diffusion models of graphene field-effect transistors *Pedro Carlos Feijoo Guerro* (UPM)
16:40–16:55	Accurate modelling of a GaAs-based laser power converter *Javier Fernández-Lozano* (USC)
17:00–17:30	Coffee break
	Session: **Posters (I)** Session Chair: *José M. Quero*
17:30–19:00	Materials (H1) Modeling (H2) Characterization (H3) Sensors (V1) Biomedical (V3)

Social program Tuesday

19:30–20:30	Guided visit through the historical center of Valencia *Meeting point: ADEIT main entrance*
20:30–22:00	Welcome cocktail Cloister – La Nau *C/ de la Universitat, 2, 46003 València*

June 7th, Wednesday

	Session: **New devices** Session Chair: *Fernando Calle*
9:00–9:15	Technology development for exploring novel concepts in semiconductor qubits *Joan Bausells* (IMB-CNM)
9:20–9:35	Modeling and Characterization of GaN Schottky Barrier Diodes *Beatriz Orfao* (USal)
9:40–9:55	Recent trends in graphene supercapacitors: A review from large-area to microsupercapacitors *Andrés Velasco Santiago* (UPM)
	Session: **Materials** Session Chair: *Ángel Rodríguez*
10:00–10:15	Inkjet-printed lead-free red emitting LEDs based on 2D-perovskite TEA_2SnI_4 *Giovani Vescio* (UB)
10:20–10:35	High-pressure sputtering of Mo targets in mixed $Ar/O_2/H_2$ atmospheres for hole selective contacts in photovoltaic cells *Enrique San Andrés* (UCM)
10:40–10:55	A novel polymer-assisted CVD method for controllable and scalable MoS_2 deposition *Lulin Wang* (TC, Dublin)
11:00–11:30	Coffee break
	Session: **Photovoltaic (II)** Session Chair: *Carlos Algora*
11:30–11:45	Device architectures for germanium TPV cells with efficiencies over 30% *Pablo Martín* (IES, UPM)
11:50–12:05	Development of nanocrystalline silicon as electron selective contact for Germanium thermophotovoltaic cells *Mansur Gamel* (UPC)
12:10–12:25	High Q factor two-port SAW resonators with single and multi-cavity modes. *Serine Guellati* (ISOM, UPM)
	Session: **Sensors (II)** Session Chair: *Albert Romano*
12:30–12:45	Exploring alternative materials as a gate dielectric for RADFET radiation sensors *Amat Esteve* (IMB-CNM)
12:50–13:05	Near ambient pressure XPS study of NiO gas sensing mechanisms for ethanol detection at room temperature *Javier Bartolomé* (URJC)

13:10–13:25 Four-quadrant Silicon and Silicon Carbide Photodiodes for Beam Position and Monitor Applications
Joan Marc Rafí (IMB-CNM)

13:30–15:00 Lunch

15:00–15:50 Charla invitada

Prof. Ignacio Mártil
Universidad Complutense de Madrid, Spain

La historia del transistor

15:50–16:10 Acto conmemorativo

Historia del CDE

16:10–17:00 Mesa redonda

La microelectrónica en España: presente y futuro

Prof. Luis Fonseca (IMB-CNM)

Dr. Fernando Guarín (Globalfoundries, IBM, IEEE EDS)

Prof. Blas Garrido Fernández (AEI, UB)

Dr. Javier Calpe (Analog Devices, UV)

D. Alfonso Gabarrón Gonzáles (AESEMI)

17:00–17:30 Coffee break

Session: **Posters (II)**
Session Chair: *Francesca Campabadal*

17:30–19:00 Memristors (SS)

Photovoltaic (V2)

Other (V4)

Social program Wednesday

19:45 Bus transport to the boat trip and gala dinner
Meeting point: C/ Poeta Querol 8

20:15–20:45 Boat trip by Albufera
Meeting point: Mirador de Gola

21:00–23:30 Gala dinner: Restaurant Nou Racó
Carretera del Palmar, 21, 46012, València

23:30 Bus transport to the city center

June 8th, Thursday

	Session: **Memristors (I)** Session Chair: *Juan B. Roldán*
9:00–9:15	Multi-level programming on radiation-hard 1T1R memristive devices for in-memory computing *Emilio Perez-Bosch* (LIIM, Leibniz)
9:20–9:35	Effect of temperature on multilevel properties and set and reset transitions on HfO_2-based resistive switching devices *Salvador Dueñas* (UVa)
9:40–9:55	Current driven random exploration of resistive switching devices, an opportunity to improve bit error ratio. *Albert Cirera* (UB)
	Session: **Memristors (II)** Session Chair: *Rodrigo Picos*
10:00–10:15	Influence of the tungsten etching process on the resistive switching characteristics of TiN/Ti/HfO_2/W memristors *Mercedes Saludes* (IMB-CNM)
10:20–10:35	Effect of stochastic resonance on memristor-based binary neuromorphic STDP protocol *Emili Salvador Aguilera* (UAB)
10:40–10:55	Conductance quantization in h-BN memristors *Juan B. Roldán* (UGr)
11:00–11:30	Coffee break
11:30–12:30	Invited talk ***Prof. Ronald Tetzlaff*** Technische Universität Dresden, Germany Memristors
	Session: **Photovoltaic (III)** Session Chair: *Eduardo Fernández*
12:30–12:45	Unintentional doping in GaAsSb/GaAsN superlattice solar cells *Malte Schwarz* (ISOM, UPM)
12:50–13:05	Temperature-dependence photoluminescence and transmittance of $CsCu_2I_3$ perovskites *Joshua Diago Forero* (UB)
13:10–13:25	Semi-transparent photovoltaics based on bifacial cells and rear concentrators to enhance efficiency and light quality *Mª Ángeles Ceballos* (UJaen)
13:30–15:00	Lunch Closing Ceremony

Plenary talks

Samar K. Saha
Prospicient Devices, Milpitas, CA 95035 USA

An overview of FinFET devices and non-planar CMOS device technology

Abstract

The continuous miniaturization of conventional metal-oxide-semiconductor (MOS) field-effect transistor (MOSFET) devices and planar complementary MOS (CMOS) technology to achieve high-performance, reduced power consumption, and higher-density integration has become more challenging due to several constraints imposed by the fundamental principles of device physics for short-channel devices. In order to overcome the major scaling challenges such as degradation of leakage current and process variability-induced device parameter variation of the conventional planar MOSFETs in the nanometer nodes, the semiconductor industry (in the year 2011) adopted three-dimensional non-planar MOSFETs such as FinFET devices and non-planar CMOS technology for manufacturing IC chips in the sub-20 nm regime. The FinFETs offer significantly superior device performance including faster switching speed and higher current drive compared to the mainstream MOSFETs. In this talk, an overview of FinFET device architecture and non-planar CMOS technology integrating FinFETs will be discussed.

Biography

Samar Saha has served as the 2016-2017 President of the IEEE Electron Devices Society (EDS). Currently, he is the Chief Scientist at Prospicient Devices and an Adjunct Professor in the Electrical Engineering (EE) department, Santa Clara University, USA. Since 1984, he has worked in various technical/management positions at National Semiconductor, LSI Logic, Texas Instruments, Philips Semiconductors, Silicon Storage Technology, Synopsys, DSM Solutions, Silterra USA, and SuVolta. In academia, he was an EE faculty at Southern Illinois University at Carbondale, Illinois; Auburn University, Alabama; the University of Nevada at Las Vegas, Nevada; and the University of Colorado at Colorado Springs, Colorado.

He has authored over 100 research papers; two books entitled, “FinFET Devices for VLSI Circuits and Systems” (2020) and “Compact Models for Integrated Circuit Design: Conventional Transistors and Beyond” (2015); one book chapter on Technology Computer-Aided Design (TCAD); and holds 12 US patents. His book on FinFET has been translated in Chinese language and published, entitled, “Nanoscale integrated Circuits FinFET Device Physics and Modeling” (2022).

Dr. Saha received the PhD degree in Physics from Gauhati University and an MS degree in Engineering Management from Stanford University. He is a distinguished Lecturer of IEEE EDS, an IEEE Life Fellow, and a Fellow of the Institution of Engineering and Technology (IET), UK. He is the recipient of 2021 IEEE EDS Distinguished Service Award.

Arokia Nathan
Darwin College, University of Cambridge

Ultralow power flexible electronics

Abstract

A key design consideration in flexible electronics, particularly for wearables and sensing applications, is low voltage, low power operation. This requirement not only serves to maximize battery lifetime but crucially ensures the operational stability of thin film transistor (TFT) circuits and systems. Ultralow voltage/current operation is especially important in sensor interfaces so as to achieve a high resolution of the sensory signal. This presentation will review the TFT design and materials selection strategies for ultralow-power operation. We examine the main issues that lead to a high operating voltage of the TFT and discuss processing conditions for suppressing the interface trap density. Recent advances in low-voltage thin-film transistors show it is possible for the subthreshold slope to approach the thermionic limit, q/kT. Based on these considerations, an all-inkjet-printed ultra-low-power high-gain amplifier, applied to eye movement tracking by detecting human electrooculogram signals, is presented.

Biography

Arokia Nathan is a leading pioneer in the development and application of thin film transistor technologies to flexible electronics, display and sensor systems. Following his PhD in Electrical Engineering, University of Alberta, Canada in 1988, he joined LSI Logic USA and subsequently the Institute of Quantum Electronics, ETH Zürich, Switzerland, before joining the Electrical and Computer Engineering Department, University of Waterloo, Canada. In 2006, he joined the London Centre for Nanotechnology, University College London as the Sumitomo Chair of Nanotechnology. He moved to Cambridge University in 2011 as the Chair of Photonic Systems and Displays, and he is currently a Bye-Fellow and Tutor at Darwin College.

He has over 600 publications including 4 books, more than 110 patents, and four spin-off companies.

He is a Fellow of IEEE, a Distinguished Lecturer of the IEEE Electron Devices Society and Sensor Council, a Chartered Engineer (UK), a Fellow of the Institution of Engineering and Technology (UK), and winner of the 2020 IEEE EDS JJ Ebers Award.

Ignacio Mártil de la Plaza
Universidad Complutense, Madrid

La historia del transistor

Resumen

El mundo en el que vivimos sería inconcebible sin las potentísimas herramientas de las que disponemos para estar conectados. La electrónica, la principal ciencia responsable de mantenernos en comunicación casi permanente, está presente a todas horas en nuestra vida cotidiana: teléfonos móviles, ordenadores, internet, etc. ¿Cómo hemos llegado hasta aquí? En esta charla se revive la historia del desarrollo sin precedentes de la electrónica y de la tecnología que la hace posible, la Microelectrónica. Se analiza qué son los semiconductores, como funcionan y se fabrican, cual ha sido la historia de la invención de los dispositivos que han permitido esta revolución: el transistor y el circuito integrado. En el libro se describen de forma cronológica e ilustrada con numerosos dibujos y fotografías, los principales hitos que han dado lugar a esta verdadera revolución, que ha cambiado nuestra vida hasta extremos difíciles de imaginar hace unos pocos años.

Biografía

Ignacio Mártil de la Plaza es doctor en Física y Catedrático de Electrónica. Trabaja en la Universidad Complutense de Madrid, donde realiza actividades docentes e investigadoras, de carácter marcadamente experimental, en el campo de la física de los semiconductores. Es especialista en propiedades eléctricas y ópticas de estos materiales, así como en dispositivos electrónicos y opto-electrónicos basados en ellos. En la actualidad, su campo de investigación principal es el estudio de conceptos avanzados en células solares y en fotodetectores de infrarrojo basados en silicio.

Es co-autor de más de 160 artículos científicos publicados en revistas de alto impacto de ámbito internacional; ha presentado más de 100 ponencias en congresos internacionales y es miembro de la Real Sociedad Española de Física. En 2021 el jurado de los Premios de Física Real Sociedad Española de Física-Fundación BBVA lo ha galardonado con el premio a la Enseñanza y Divulgación de la Física (modalidad Enseñanza Universitaria).

Fuera del ámbito académico, es muy activo en tareas de divulgación científica, tiene un blog personal de divulgación científica, que se llama “Un poco de ciencia, por favor”.

Ronald Tetzlaff
Technische Universität Dresden, Germany

Memristors

Abstract

Memristors, or memory resistors, are a type of electronic device that can store and process information in a way that mimics the synaptic behavior of the human brain. As such, memristors hold great potential for revolutionizing computing and artificial intelligence. Over the past few years, there have been significant advances in the development of memristor-based technologies, from novel materials and fabrication techniques to applications in neuromorphic computing, analog computing, and beyond. In this talk, we will hear from leading researchers in the field about the latest breakthroughs in memristor science and engineering, and explore the exciting possibilities that lie ahead.

Biography

Ronald Tetzlaff is a Full Professor of Fundamentals of Electrical Engineering at the Technische Universtität Dresden, Germany. From 1999 to 2003 Ronald Tetzlaff was Associate Editor of the IEEE, Transactions on Circuits and Systems: part I. He was “Distinguished Lecturer” of the IEEE CAS Society (2001 to 2002). He is a member of the scientific committee of different international conferences. He was the chair of the 7th IEEE International Workshop on Cellular Neural Networks and their Applications (CNNA 2002) and organized several special sessions at circuit and systems-related conferences. From 2005 to 2007 he was the chair of the IEEE Technical Committee Cellular Neural Networks & Array Computing. Ronald Tetzlaff is a member of the *Informationstechnische Gesellschaft* (ITG) and the German Society of Electrical Engineers and of the German URSI Committee. Ronald Tetzlaff is in the Editorial Board of the International Journal of Circuit Theory and Applications since 2007 and he is also in the Editorial Board of the IEEE, Transactions on Circuits and Systems: part II since 2016. He was Associate Editor of the AEÜ – International Journal of Electronics and Communications from 2008 to 2016.

Ronald Tetzlaff was the chair of the 18th IEEE Workshop on Nonlinear Dynamics of Electronic Systems (NDES 2010), the chair of the 5th International Workshop on Seizure Prediction (IWSP5 2012) , the chair of the 21st European Conference on Circuit Theory and Design (ECCTD 2013), the chair of the 5th Memristor and Memristive Symposium 2016, and of the 15th IEEE International Workshop on Cellular Nanoscale Networks and their Applications (CNNA 2016). Since 2014 he serves as the leader of working group 2 (Memristor Theory, Modelling and Simulation) in the EU COST action MemoCIS (IC 1401) on Memristors – Devices, Models, Circuits, Systems, and Applications. Ronald Tetzlaff serves as a reviewer for several journals and for the European Commission.

Mesa redonda

La microelectrónica en España: presente y futuro

Luis Fonseca
Head of IMB-CNM

Dr. Luis Fonseca was born in Barcelona, Spain. He received his Ph.D. degree in Physics from the Autonomous University of Barcelona in 1992. He has developed his whole professional career in the National Center of Microelectronics (CNM). After a first research period on thin dielectrics, he worked as a process engineer, being in charge of the diffusion and deposition areas of the CNM production facilities, till he joined the Microsystems department as a full senior researcher in 2001. Nowadays he is leading the 'MicroEnergy sources and Sensor Integration' group, which deals with gas sensors, Si nanowire based thermogenerators, and micro fuel cells. He has participated in tens of national and international projects dealing with micronanotechnologies and has published more than 80 papers. Among other responsibilities, Luis Fonseca was IMB-CNM deputy director in the period June 2012- June 2016; he is a member of the Steering Committee of the European Technology Platform on Smart Systems (EPoSS), and member of the Steering Committee of the Spanish TIC technological platform (PLANETIC).

Fernando Guarín
GlobalFoundries, Senior past-President of the IEEE EDS

Fernando Guarín received a B.S.E.E. degree from Pontificia Universidad Javeriana, Bogotá, Colombia, an M.S.E.E. degree from the University of Arizona, and a Ph.D. degree in electrical engineering from Columbia University, New York, NY, USA. He is a Distinguished Member of the Technical Staff with Global Foundries, East Fishkill, NY, USA. He retired from IBM's SRDC after 27 years as a Senior Member of Technical Staff. From 1980 to 1988, he worked with the Military and Aerospace Operations Division, National Semiconductor Corporation. In 1988, he joined IBM's Microelectronics Division, where he worked in the reliability physics and modeling of advanced bipolar, CMOS, and silicon–germanium BiCMOS technologies. He has been actively working in microelectronic reliability for over 35 years. He is currently leading the team qualifying GlobalFoundries RF 5G technology offerings. Dr. Guarín is a Distinguished Lecturer for the IEEE Electron Device Society EDS, where he has served in many capacities, including a member of the IEEE's EDS Board of Governors, the Chair of the EDS Education Committee, and the Secretary for EDS. He was the EDS President from 2018 to 2019.

Prof. Blas Garrido Fernández
Manager of CIT (MNP subarea) at AEI

Blas Garrido is a Professor of Electronics at the University of Barcelona (UB) since 2011. He leads the Optoelectronics and Printed Electronics Group (ÓPERA) of the UB Department of Electronic and Biomedical Engineering (DEEB). He is also the Director of the Technology Transfer unit of the Department (CEMIC). He has participated as a group leader in 8 European 6^{th} and 7^{th} FP and H2020 projects, and in 7 National Projects. He teaches the Master in Photonics, Nanoscience and Nanotechnology and Renewable Energies, and in the Physics and Electronic Engineering degrees at UB. He has supervised 17 doctoral theses and more than 20 master's and bachelor's theses. He has published more than 312 papers and more than 320 contributions to international conferences, including 43 invited papers and his h-factor is 34. He has directed a master and a Ph.D. at UB and has been part of evaluation panels for 15 years at the national level and in Brussels. He is a member of international associations such as SECPHO, IEEE, ECS, EPIC, and others.

Dr. Javier Calpe

Head of the Design Center of Analog Devices in Valencia

(M'90) received his B.Sc. in 1989 and his Ph.D. degree in 1993 in Physics from the Universitat de Valencia (Spain) in the area of heart rate variability and fibrillation where he lectures in M.Sc.level. He is Design Center Manager at the Analog Devices Development Center located in Valencia. He holds six industrial patents and has co-authored more than 80 papers in scientific magazines and 170 communications to conferences. Has led 32 projects with private companies and 22 with public funds, including co-leading one funded by the EU. His research activities include remote sensing, hyperspectral imagery, and digital signal processing.

Dr. Alfonso Gabarrón Gonzalez

General Manager of AESEMI

The Spanish Semiconductor Industry Association - AESEMI - was founded at the end of 2021 by the companies Wiyo (Yocto Technologies), Imasenic, Kdpof and ICMálaga. Its creation was motivated by the great need to digitize processes, simulate more productive and efficient physical scenarios in real-time, develop new technologies for automation, optoelectronic development, and advances in the automotive sector, among others. The aim of the association is to give visibility to all the companies that form part of the semiconductor technology ecosystem in Spain. Thanks to this platform, not only the growth of this industry is boosted, but also the option for large companies to have solutions to cover the commitments of decarbonization and digitization, which are common factors for all industries, already worldwide.

Posters

H1: Materials

[a] Enhanced luminescence performance of Methylammonium Lead Bromide Perovskite films by the introduction of Bathocuproine Organic Additive
Carmen Coya (URJC)

[b] First principles characterization of PnVm clusters in crystalline silicon
Iván Santos (UVa)

[c] Stopping layer and oxigen incorporation during cryogenic-temperature implantations in germanium
Daniel Caudevilla Gutiérrez (UCM)

[d] Understanding substrate effects on two-dimensional MoS_2 growth: a Kinetic Monte Carlo approach
Samuel Aldana Delgado (TC, Dublin)

[e] Laser induced graphene flexible microsupercapacitors
Assia Hamada (ISOM-UPM)

[f] Subbandgap photoresponse induced by pulsed laser melting in GaAs
Sari Algaidy (UCM)

[g] Macroporous silicon membranes for hydrogen production from multiple fuel sources
Ángel Rodríguez (UPC)

H2: Modeling

[a] Extending the small-signal modeling of GFETs to ambipolarity regime
Nikolaos Mavredakis (UAB)

[b] Subharmonic mixing based on the graphene field-effect transistor ambipolarity
Mari Carmen Pardo Martínez (UGr)

[c] TCAD simulation of Electrolyte-Gated Graphene FET biosensors
Francisco Gámiz (UGr)

[d] Voltage modulation of oxygen vacancy-related dipoles in gate insulators as a mechanism for non-volatile memories
Juan Cuesta-Lopez (UGr)

[e] Finite element model of giant magnetoresistance (GMR) based sensors for microfluidic applications
Càndid Reig (UV)

[f] Molecular dynamics study of stress relaxation mechanisms during Ge deposition on Si(100) 2x1 substrates
Luis Martín Encinar (UVa)

H3: Characterization

[a] Analysis of circular transfer length methods for the optimization of metal contacts on wafers
Aitana Cano Pérez (IES, UPM)

[b] Analysis of the statistical impact of variability in a 12 nm nanosheet FET
Julián García Fernández (USC)

[c] Memory effects and current transient response of AlGaN/GaN nanochannels
Héctor Sánchez Martín (USal)

[d] A smart measurement system for the nanoscale and device level characterization of electron devices: application to GFETs
Marc Portí Pujal (UAB)

[e] Model parameter extraction of CMOS Time-Dependent Variability in a wide gate and drain voltage range
Gerard Pedreira Rincón (UAB)

[f] Analysis of the gate-size dependence of microwave detection in GaN-based HEMTs
Gaudencio Paz Martínez (USal)

[g] Confocal micro-Raman spectroscopy study of phonon-plasmon modes in GaN structures for power devices
Jesús Ortiga-Fibla (UV)

[h] Electromagnetic interference shielding solutions for integrated circuits
José Torres (UV)

V1: Sensors

[a] Implementation of microthrusters for space applications using PCBMEMS
José M. Quero (US)

[b] All-Si based micro-thermoelectric generators enhanced by heat sink integration
Alex Rodriguez-Iglesias (IMB-CNM)

[c] Spin-valve-based magnetic field sensors with a voltage divider topology
Candid Reig (UV)

[d] Integration of thin film thermoelectric oxide material into micro thermoelectric generators
Iñigo Martin-Fernandez (IMB-CNM)

[e] Synthesis of gold-decorated Al nanostructures as platforms for SERS detection
Gohar Ijaz Dar (URiV)

[f] Conductive MOFs as Chemiresistors for Greenhouse Gas Sensing
Ignasi Fort Grandas (UB)

[g] ZIF-8 based sensors for chemical vapors optical detection
Anna Estany Macià (UB)

[h] Highly sensitive 2D TMDs based NO2 gas sensors via AACVD and APCVD combination
Fatima Ezahra Annanouch (URiV)

[i] Integration of a scintillator as gamma radiation sensor
Esteve Amat (IMB-CNM)

[j] Flexible carbon-based thermoelectric generator based on a phase change material for cold-chain monitoring
Lorenzo Pimpolari (IMB-CNM)

V2: Photovoltaic

[a] Characterization of aluminum laser-fired contacts on p-type c-Ge for TPV devices
Gerard Rivera (UPC)

[b] GaInP photovoltaic converters for remote high-power optical transmission
Pablo Sanmartín (UJaen)

[c] Optoelectronic properties of GaP:Ti photovoltaic devices
Javier Olea (UCM)

[d] Fabrication of TiO_x by high pressure sputtering for selective contacts in photovoltaic cells
Francisco José Pérez Zenteno (UCM)

[e] Integration of metal-assisted chemical nanotexturing in crystalline silicon solar cell processing
David Fuertes Marrón (IES, UPM)

[f] Development of an interdigitated back contact architecture for chalcogenide-based solar cells
Juan de Dios Castillo (UPC)

[g] Inkjet-printed halide perovskite LEDs with metal oxide transport layers
Sergio Gonzalez Torres (UB)

[h] Temperature analysis of n-i-p and p-i-n mixed-cation mixed-halide perovskite solar cells
Beatriz Romero (URJC)

[i] Boosting the durability of non-fullerene organic solar cells with conjugated polyelectrolyte additives (CPE-Na)
Mohamed Samir (URiV)

[j] The effect of height on the efficiency of vertical silicon tunnel junction solar cell for high solar concentration
Atabek Atamuratov (USU, Uzbekistan)

[k] Impact of atomic layer deposition temperature on electrical properties of ZnO:Al films
Pau Estarlich (UPC)

[l] Recovery of silicon and metal contacts as part of the recycling of photovoltaic modules
Carlos del Cañizo (UPM)

[m] Graphene based transparent conductive electrodes and other solar cells applications
Hana Bourahla (ISOM, UPM)

V3: Biomedical

[a] Solution-gated graphene field-effect transistors for monitoring pro-inflammatory polarization of human macrophages
Chahinez Malkia (UPM)

[b] Thoracic impedance measurements
Javier Calpe Maravilla (ADI)

V4: Other devices

[a] Impact of traps on direct microwave detection with AlGaN/GaN nanodiodes at low temperature
Elsa Pérez-Martín (USal)

[b] NLGAD detectors for low penetrating particles: concept and first results
Jairo Villegas (IMB-CNM)

[c] Terahertz rectification using graphene-based field effect transistor with integrated antenna
El Hadj Abidi (USal)

[d] High temperature logic level Si-VDMOS power transistors
Miquel Vellvehi (IMB-CNM)

[e] $ZnMn_2O_4$ as a material for supercapacitors and its stability against the electrolyte
Elena Navarrete Astorga (UMa)

[f] Manufacturing vertical silicon nanowire devices to extend the performance of future circuits and systems
Esteve Amat (IMB-CNM)

[g] Improved functional RF-high power devices based in nanostructured surfaces
Isabel Montero (ICMM, CSIC)

SS: Memristors

[a] Praseodymium content influence on the resistive switching effect of HfO2-based RRAM devices
Héctor García (UVa)

[b] Memristors based on Ti/Al_2O_3: Fabrication and characterization
Francesca Campabadal (IMB-CNM)

[c] A comparison of resistive switching parameters for memristive devices with HfO2 monolayers and Al_2O_3/HfO_2 bilayers at the wafer scale
Eduardo Pérez (IIM, IHP-Leibniz)

[d] Temperature analysis of the switching dynamics of TiN/Ti/HfO_2/W resistive memories
Juan Bautista Roldan Aranda (UGr)

[e] Influence of the topological configuration in the Resistive Switching effect and endurance of TiN/Ti/HfO_2/W stacks
Helena Castán (UVa)

[f] Characterization of HfO_x 1T1R memristors for analog programming
Teresa Serrano-Gotarredona (IMS-CNM)

[g] Thermal dependence of the resistance of TiN/Ti/HfO_2/Pt memristors
Francisco Jiménez-Molinos (UGr)

[h] Experimental observation of memristive behaviour on a Sb_2Se_3 solar cell
Rodrigo Picos (UIB)

[i] A comprehensive simulation framework to validate progressive read-monitored write schemes for ReRAM
Ioannis Vourkas (UTFSM, Chile)

[j] Characterization and modeling of variability in commercial self-directed channel memristors
Francisco Jiménez-Molinos (UGr)

[k] Neuromorphic and logic circuit simulation using in-house fabricated GrAphene-based MEmristor (GAME)
Francisco Javier Garcia Ruiz (UGr)