

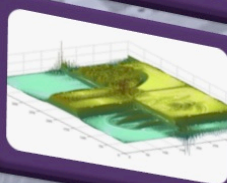


# 9<sup>th</sup> Spanish Conference on Electron Devices

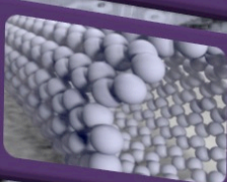
Valladolid, 12-14 February 2013



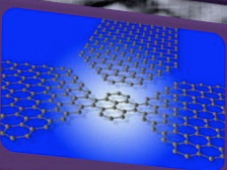
Process technology for devices and simulation



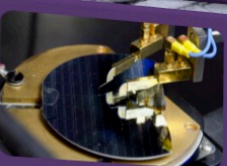
Device modeling



Sensors, actuators and micro/nano systems



Emerging devices



Characterization and reliability



Solar Energy



**Palacio de Congresos Conde Ansúrez  
Real de Burgos, s/n. 47011**





**9<sup>th</sup> Spanish Conference on Electron Devices**

Valladolid, 12-14 February 2013



# **CDE'2013**

**9<sup>th</sup> Spanish Conference  
On Electron Devices**

**Palacio de Congresos  
*Conde Ansúrez***

***Valladolid, Spain  
February 12-14, 2013***

[www.cde2013.es](http://www.cde2013.es)







# 9<sup>th</sup> Spanish Conference on Electron Devices

Valladolid, 12-14 February 2013



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## TECHNICAL CO-SPONSORSHIP:









# 9<sup>th</sup> Spanish Conference on Electron Devices

Valladolid, 12-14 February 2013



## WELCOME LETTER

The 9th Spanish Conference on Electron Devices brings together the work of both research groups and companies on the field of electronic devices. This edition will take place from the 12<sup>th</sup> to the 14<sup>th</sup> of February of 2013, in Valladolid, carrying on with a series of previous events in Palma de Mallorca (2011), Santiago de Compostela (2009), El Escorial (Madrid, 2007), Tarragona (2005), Calella de la Costa (2003), Granada (2001), Madrid (1999) and Barcelona (1997).

As usual, the Conference program consists of invited and contributed papers organized in the topic sessions. The Congress will conclude with a workshop about Solar Energy, which will be composed by 7 talks, 22 posters and a round table with the participation of companies from the Solar Energy Cluster of Castilla and León. Just before the CDE conference opening, a Mini Colloquium (MQ) of Electron Device Society (EDS) will take place at the same venue as CDE, without additional registration fees. In this way, all the CDE participants may attend to both events.

The total number of contributions is 122: 2 plenary talks, 11 invited talks, 25 talks, and 84 posters, distributed in the following topics:

- S1 Process technology for devices and simulation
- S2 Device modeling
- S3 Sensors, actuators and micro/nano systems
- S4 Emerging devices
- S5 Characterization and reliability
- S6 Solar energy: thermal and photovoltaic devices

Most of the contributions presented at this conference come from Spanish Universities and Research Centers. 30 % of them are fruit of the cooperation between Spanish and foreigner institutions and 15% of the works come from researchers of foreign countries. It is important to point out the high number of collaborations among different institutions (41%), so indicating the increase of cooperative work of the Spanish research groups in the CDE scope.

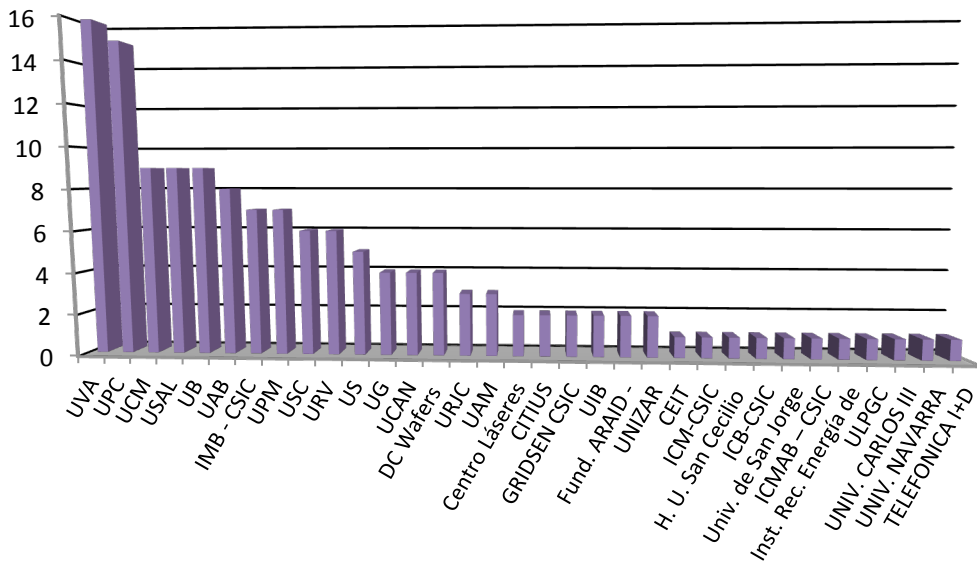
Because of the delicate economic situation, fundings to the Congress have been significantly reduced compared to previous years, so this issue will necessarily be austere without any impact on the scientific quality. We appreciate in advance the understanding of this forced sobriety and we are convinced that in order to address these difficulties we must use all our resources to ensure that science and progress will continue developing.

As Vladimir Nabokov says: “there is no science without fancy”, although Hans Magnus Enzensberger believes that “poetry of science is not at ground level, but comes from the deepest layers”. We have organized this conference with the belief that scientific research is a great privilege for the human being.

We would like to thank all the supports received from the following organizations and companies: University of Valladolid, Campus de Excelencia Internacional E<sup>3</sup>-“Los Horizontes del Hombre”, Government of Castilla y León, City of Valladolid, Diputación de Valladolid, IEEE Spanish Section, Electron Device Society, Banco Santander, Instrumentos de Medida S.L., Agilent Technologies, SicenTec, and American Elements®. We extend our thanks to the CDE Advisory and Technical Committees, as well as to the organizers of the CDE from previous editions.

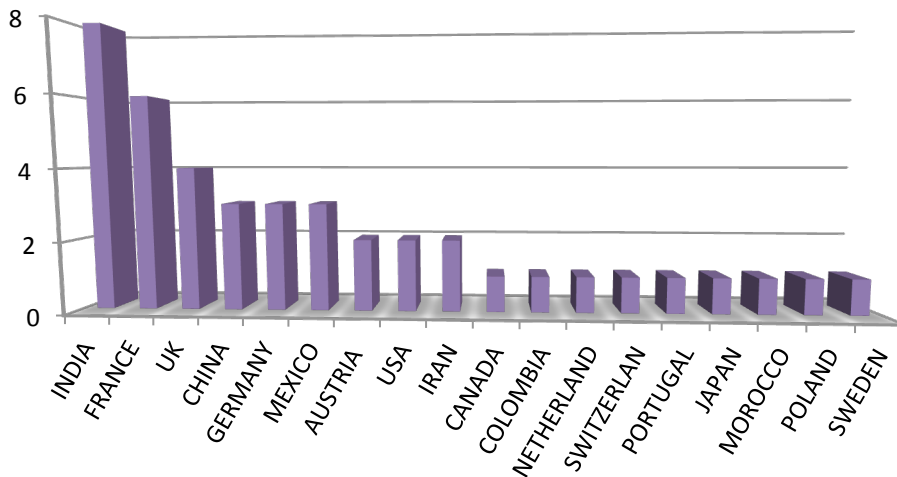
Our very special thank to the CDE Advisory Committee Chair, Prof. José Millán.

### Contributions from Spanish Research Centers and Universities



The Conference Local Committee

### Contributions from Foreign Countries





# 9<sup>th</sup> Spanish Conference on Electron Devices

Valladolid, 12-14 February 2013



## CDE 2013 PROGRAM

### Tuesday, Feb. 12, 2013

14.00 h - 20.00 h	REGISTRATION
14.00 h - 18.00 h	Mini Colloquium EDS. <b>Prof. Benjamín Íñiguez, Univ. Rovira I Virgili, Chair</b>
18.30 h - 20.00 h	WELCOME RECEPTION
20.00 h -	RUTA DE TAPAS

### Wednesday, Feb. 13, 2013

8.00 h - 8.30 h	REGISTRATION
8.30 h - 8.45 h	OPENING: <b>Prof. José Millán, CDE Advisory Committee Chair</b>
8.45 h - 9.30 h	<b>PLENARY TALK: Prof. Emilio Lora-Tamayo, CSIC Chair</b>
9.30 h - 11.35 h	<b>SESSION 1:</b> Process technology for devices and simulation
11.35 h - 12.00 h	COFFEE BREAK
12.00 h - 14.05 h	<b>SESSION 2:</b> Device modeling
14.05 h - 15.30 h	LUNCH
15.30 h - 17.35 h	<b>SESSION 3:</b> Sensors, actuators and micro/nano systems
17.35 h - 18.00 h	COFFEE BREAK
18.00 h - 19.30 h	<b>POSTER: SESSIONS 1 - 5</b>
19.30 h - 20.30 h	CLASSICAL MUSIC PERFORMANCE
21.30 h -	GALA DINNER

CDE Committee Meeting

EDS Chapter of the Year Award

### Thursday, Feb. 14, 2013

8.00 h - 10.05 h	<b>SESSION 4:</b> Emerging devices
10.05 h - 10.30 h	COFFEE BREAK
10.30 h - 12.35 h	<b>SESSION 5:</b> Characterization and reliability
12.35 h -	<b>WORKSHOP: SOLAR ENERGY</b>
12.35 h - 14.00 h	<b>POSTER: SESSION 6</b>
14.00 h - 15.30 h	LUNCH
15.30 h - 16.15 h	<b>PLENARY TALK: Prof. Pilar Espinet, IES-UPM</b>
16.15 h - 18.15 h	<b>SESSION 6:</b> Solar Energy: thermal and photovoltaic devices
18.15 h - 18.30 h	COFFEE BREAK
18.30 h - 19.45 h	<b>ROUND TABLE. Prof. Juan Jiménez, Univ. Valladolid. Chair</b>
19.45 h - 20.00 h	CLOSING REMARKS
22.30 -	"Miss Cellany", Jazz Rock. Herminio's Bar

EDS: Best Student Award

### OUT OF PROGRAM:

Friday, Feb. 15, 2013 (for the participants staying in Valladolid)  
Sightseeing on foot and museums.

## Tuesday, Feb. 12, 2013

14.00 h - 20.00 h	Palacio de Congresos Conde Ansúrez, third floor REGISTRATION
14.00 h - 18.00 h	Auditorium, Palacio de Congresos Conde Ansúrez, third floor EDS MINI COLLOQUIUM. <b>Prof. Benjamín Íñiguez</b> , Univ. Rovira I Virgili. <i>Chair</i>
18.30 h - 20.00 h	Palacio de Santa Cruz WELCOME RECEPTION: <b>Prof. Marcos Sacristán</b> , Chancellor of University of Valladolid
20.00 h -	RUTA DE TAPAS: Tapas bars in the city center

## Wednesday, Feb. 13, 2013

8.00 h - 8.30 h	Palacio de Congresos Conde Ansúrez, third floor REGISTRATION
8.30 h - 8.45 h	Auditorium, Palacio de Congresos Conde Ansúrez, third floor OPENING: <b>Prof. José Millán</b> , CDE Advisory Committee Chair
8.45 h - 9.30 h	<b>PLENARY TALK: Prof. Emilio Lora-Tamayo</b> , CSIC Chair
9.30 h - 11.35 h	Auditorium, Palacio de Congresos Conde Ansúrez, third floor <b>SESSION 1: Process technology for devices and simulation</b> <b>Chairperson: Prof. Javier Martínez Rodrigo</b>

9.30 h - 9.55 h

**O.1.1. Invited:** *Thin Dielectric Films Grown by Atomic Layer Deposition: Properties and Applications.*

Francesca Campabadal, J.M. Rafí, M.B. González, M.Zabala, O. Beldarrain, M.C. Acero and M. Duch

Institut de Microelectrònica de Barcelona, IMB-CNM (CSIC).

9.55 h - 10.15 h

**O.1.2.** *Plasma oxidation of metallic Gd deposited on silicon by high pressure sputtering as high permittivity dielectric* **R38**

M. A. Pampillón<sup>1</sup>, P. C. Feijoo<sup>1</sup>, E. San Andrés<sup>1</sup>, J. L. G. Fierro<sup>2</sup>

<sup>1</sup> Departamento de Física Aplicada III (Electricidad y Electrónica). Facultad de Ciencias Físicas. Universidad Complutense de Madrid. 28040, Madrid, Spain.

<sup>2</sup> Instituto de Catálisis y Petroleoquímica. CSIC. Cantoblanco. 28049, Madrid, Spain.

10.15 h - 10.35 h

**O.1.3.** *Use of PMMA to obtain Graphene layers*

**R93**

A. Bosca<sup>1</sup>, D. Lopez-Romero<sup>1</sup>, S. Alvarez-Garcia<sup>2</sup>, A. de Andres<sup>2</sup>, J. Pedros<sup>1</sup>, J. Martinez<sup>1</sup> and F. Calle<sup>1</sup>

<sup>1</sup>Instituto de Sistemas Optoelectrónicos y Microtecnología, Universidad Politécnica de Madrid, 28040 Madrid, Spain.

<sup>2</sup>Instituto de Ciencia de Materiales de Madrid, Consejo Superior de Investigaciones Científicas, 28049 Madrid, Spain.

10.35 h - 10.55 h

**O.1.4.** *Nanodevice simulations on CloudStack*

**R98**

F. Gomez-Folgar, E. Comesaña, R. Valin, A. Garcia-Loureiro, T. F. Pena.

Centro de Investigación en Tecnoloxías da Información (CITIUS). Universidad de Santiago de Compostela.

10.55 h - 11.15 h

**O.1.5.** *Direct-write patterning of metals and reduced graphene oxide electrodes by arc erosion for organic device manufacturing*

**R110**

M. García-Vélez, A. L. Alvarez, C. Coya, G. Alvarado, J. Jiménez-Trillo<sup>1</sup>, X. Díez-Betriú<sup>2</sup>, A. de Andrés<sup>2</sup>

Dpt. Tecnología Electrónica, ESCET, Universidad Rey Juan Carlos, Móstoles, 28933 Madrid (Spain)

<sup>1</sup>Dpt. Ingeniería de Circuitos y Sistemas, EUIT Telecomunicación, UPM, 28031 Madrid (Spain)

<sup>2</sup>Instituto de Ciencia de Materiales de Madrid, CSIC. Cantoblanco, 28049 Madrid (Spain)

11.15 h - 11.35 h

**O.1.6.** *Microscopic modeling of interdiffusion in SiGe alloys*

**R117**

Pedro Castrillo, Iván Santos, Ruth Pinacho, Emiliano Rubio, and Martín Jaraiz

Dpto. de Electrónica, Universidad de Valladolid, E.T.S.I. Telecomunicación, Paseo Belén 15, 47011 Valladolid, Spain.

11.35 h - 12.00 h

COFFEE BREAK

12.00 h - 14.05 h

*Auditorium, Palacio de Congresos Conde Ansúrez, third floor*

**SESSION 2: Device modeling**

**Chairperson: Prof. Juan Antonio López Villanueva**

12.00 h - 12.25 h

**O.2.1. Invited:** *Modeling of radiation effects in MOSFETs*

Jesús Banqueri, M. A. Carvajal and A. J. Palma

ECsens (Electronic and Chemical SENSing Solutions), Departamento de Electrónica y Tecnología de Computadores. Universidad de Granada.

12.25 h – 12.45 h

**O.2.2.** *A new strategy to improve frequency performance of emerging devices without length scaling* **R116**

A. Benali, F. L. Traversa, G. Albareda, M. Aghoutaneb<sup>1</sup> and X. Oriols

Universitat Autònoma de Barcelona, 08193, Bellaterra, Spain

<sup>1</sup>Universidad Abdelmalek Essaâdi, 93000, Tetuán, Morocco

12.45 h – 13.05 h

**O.2.3.** *Wide frequency band scalable modeling of 3D embedded decoupling capacitors* **R22**

Hélène Jacquinot<sup>1</sup>, David Denis<sup>2</sup>

<sup>1</sup>CEA, LETI, MINATEC Campus, 17 rue des Martyrs, 38054 Grenoble. France.

<sup>2</sup>IPDIA, 2 rue de la Girafe, 14000 Caen. France.

13.05 h – 13.25 h

**O.2.4.** *Monte Carlo analysis of thermal effects in Self-Switching Diodes* **R48**

J.-F. Millithaler, I. Iñiguez-de-la-Torre, T. González, J. Mateos

Departamento de Física Aplicada, Universidad de Salamanca, 37008 Salamanca, Spain.

13.25 h – 13.45 h

**O.2.5.** *OTFT modeling: development and implementation in EDA tools* **R113**

A. Castro-Carranza<sup>1</sup>, M. Cheralathan<sup>1</sup>, C. Valla<sup>2</sup>, M. Estrada<sup>3</sup>, A. Cerdeira<sup>3</sup>, F. Pouillet<sup>2</sup>, G. Depeyrot<sup>2</sup>, B. Iñiguez<sup>1</sup> and J. Pallarès<sup>1</sup>

<sup>1</sup>Departament d'Enginyeria Electrònica (DEEEA), Universitat Rovira I Virgili 43007, Tarragona, Spain.

<sup>2</sup>DOLPHIN Integration GmbH, F-38242 Meylan, France.

<sup>3</sup>Sección de Electrónica del Estado Sólido (SEES), CINVESTAV-IPN, 07360 Mexico D.F., Mexico.

14.05 h – 15.30 h LUNCH

15.30 h – 17.35 h

*Auditorium, Palacio de Congresos Conde Ansúrez, third floor*

**SESSION 3: Sensors, actuators and micro/nano systems**

**Chairperson: Prof. Carmen Horrillo**

15.30 h – 15.55 h

**O.3.1. Invited:** *Sensors and micro and nano technologies for the food sector.*

I.Gràcia, S.Vallejos, R.Cumeras, M.Salleras, E.Figueras, J.Santander, N.Sabaté, J.P.Esquivel, C.Calaza, L.Fonseca, C.Cané.

Institut de Microelectrònica de Barcelona, IMB-CNM (CSIC).



15.55 h - 16.15 h

**0.3.2. Benzene sensor based on in-situ grown ZnO nanostructures** **R47**

J. Gonzalez-Chavarri, I. Castro-Hurtado, G. G. Mandayo, and E. Castaño Ceit and Tecnun, P. Manuel Lardizabal 15, 20018, San Sebastian, Spain

16.15 h - 16.35 h

**0.3.3. Ceramic Capacitive Pressure Sensor based on LTCC Technology** **R65**

Josep M. Fernández-Sanjuán<sup>1,2</sup>, Núria Bonet<sup>2</sup>, Josep G. Rodríguez<sup>2</sup>, Francisco M. Ramos<sup>1,2</sup>, Javier J. Sieiro<sup>3</sup>, José M. López-Villegas<sup>3</sup>, Albert Cirera<sup>1</sup>

<sup>1</sup>MIND/IN2UB Electronics Department, Universitat de Barcelona, Martí i Franquès, 1, Barcelona 08028, Spain.

<sup>2</sup>FAE- Francisco Albero S.A.U., Rafael Barradas 19, L'Hospitalet de Llobregat 08908, Spain.

<sup>3</sup>GRAF Electronics Department, Universitat de Barcelona, Martí i Franquès, 1, Barcelona 08028, Spain.

16.35 h - 16.55 h

**0.3.4. Microfluidics applied to Love-wave devices to detect biological warfare agents in dynamic mode.** **R67**

D. Matatagui<sup>1</sup>, J. Fontecha<sup>1</sup>, M.J. Fernández<sup>1</sup>, I. Gràcia<sup>2</sup>, C. Cané<sup>2</sup>, J.P. Santos<sup>1</sup>, M.C. Horrillo<sup>1</sup>

<sup>1</sup>GRIDSEN, CSIC, Serrano 144, 28006 Madrid, Spain

<sup>2</sup>Instituto de Microelectrónica de Barcelona, CSIC, Campus UAB, 08193 Bellaterra, Spain

16.55 h - 17.15 h

**0.3.5. Electroosmotic impulsion device for integration in PCB-MEMS** **R96**

Antonio Luque, José M. Soto, Francisco Perdignes, Carmen Aracil, José M. Quero. Dpto. Ingeniería Electrónica, Escuela Técnica Superior de Ingeniería, Universidad de Sevilla. Av. Descubrimientos s/n E41092 Sevilla.

17.15 h - 17.35 h

**0.3.6. Low power consumption single metal oxide nanowire based gas sensor integrated on MEMS Microhotplates** **R104**

J. Samà<sup>1</sup>, R. Jiménez-Díaz<sup>1</sup>, J.D. Prades<sup>1</sup>, O. Casals<sup>1</sup>, F. Hernandez-Ramirez<sup>2 3</sup>, J. Santander<sup>4</sup>, C. Calaza<sup>4</sup>, L. Fonseca<sup>4</sup>, C. Cané<sup>4</sup>, S. Barth<sup>5</sup>, A. Romano-Rodríguez<sup>1</sup>

<sup>1</sup> MIND-IN2UB-Dept. Electronics, Universitat de Barcelona (UB), Martí i Franquès 1, 08028, Barcelona, Spain.

<sup>2</sup> Institut de Recerca en Energia de Catalunya, Jardins de les Dones de Negre 1, 08930 Sant Adrià de Besòs, Spain

<sup>3</sup> Dept. Electronics, Universitat de Barcelona (UB), Martí i Franquès 1, 08028, Barcelona, Spain

<sup>4</sup> Institut de Microelectrònica de Barcelona, IMB-CNM-CSIC, 08193 Bellaterra, Spain

<sup>5</sup> Institute of Materials Chemistry, TU Wien, Getreidemarkt 9/165, A-1060 Vienna, Austria.

17.35 h – 18.00 h      COFFEE BREAK

18.00 h – 19.30 h      *Palacio de Congresos Conde Ansúrez, second floor*  
**POSTER: SESSIONS 1 - 5**

**POSTER - SESSION 1: Process technology for devices and simulation**

**P.1.1.** *Gadolinium scandate by high pressure sputtering as a high-k dielectric*      **R5**

P.C. Feijoo, M.A. Pampillón, E. San Andrés

Dpto. Física Aplicada III: Electricidad y Electrónica. Universidad Complutense de Madrid. Av/Complutense S/N. 28040 Madrid (Spain).

**P.1.2.** *Effects of Ozone Pre-deposition Treatment on GaSb MOS Capacitors*      **R13**

Zhen Tan, Lianfeng Zhao, Ning Cui, Jing Wang, and Jun Xu

Tsinghua National Laboratory for Information Science and Technology, Institute of Microelectronics, Tsinghua University, Beijing 100084, P.R.China.

**P.1.3.** *Towards high-k integration with III-V channels: interface optimization of high pressure sputtered Gd<sub>2</sub>O<sub>3</sub> on InP*      **R45**

E. San Andrés, M. A. Pampillón, C. Cañadilla, P. C. Feijoo, A. del Prado.

Departamento de Física Aplicada III (Electricidad y electrónica). Facultad de Ciencias Físicas, Universidad Complutense de Madrid. Madrid, E-28040.

**P.1.4.** *Etching of AlGa<sub>N</sub>/Ga<sub>N</sub> HEMT structures by Cl<sub>2</sub>-based ICP*      **R55**

Z. Gao, M. F. Romero, F. Calle

Dpto. Ingeniería Electrónica and Instituto de Sistemas Optoelectrónicos y Microtecnología. ETSI Telecomunicación, Universidad Politécnica de Madrid, 28040 Madrid, Spain.

**P.1.5.** *Ab initio study of the electronic properties of defect states in Silicon*      **R94**

Iván Santos, María Aboy, Pedro Castrillo, Pedro López, Lourdes Pelaz, and Luis A. Marqués.

Dpto. de Electrónica, Universidad de Valladolid, E.T.S.I. Telecomunicación, Paseo Belén 15, 47011 Valladolid, Spain.

**P.1.6.** *Two dimensional electron gas related luminescence in InAl(Ga)N/AlN/GaN-based heterostructures*      **R106**

M. F. Romero<sup>1</sup>, M. Feneberg<sup>2</sup>, A. Minj<sup>3</sup>, A. Cavallini<sup>3</sup>, P. Gamarra<sup>4</sup>, M.-A. di Forte Poisson<sup>4</sup>, A. Vilalta-Clemente<sup>5</sup>, P. Ruterana<sup>5</sup>, F. Calle<sup>1</sup>, and R. Goldhahn<sup>2,6</sup>

<sup>1</sup>ISOM, ETSI Telecomunicación, Universidad Politécnica de Madrid, Av. Complutense 30, 28040 Madrid, Spain

<sup>2</sup>Institut für Experimentelle Physik, Otto-von-Guericke-Universität Magdeburg, 39106 Magdeburg, Germany

<sup>3</sup>Department of Physics, University of Bologna, viale C Berti Pichat 6/II, I-40127 Bologna, Italy

<sup>4</sup>III-V Lab., Route de Nozay, 91461 Marcoussis, France

<sup>5</sup>CIMAP, UMR 6252 CNRS-ENSICAEN-CEA-UCBN, 6, Boulevard du Maréchal Juin, 14050 Caen Cedex, France

<sup>6</sup>Institut für Physik, Technische Universität Ilmenau, PF100565, 98684 Ilmenau, Germany.

**P.1.7. Fabrication of High-Ordered PBDDTTT-CF Polymer Nanopillar Arrays for Optoelectronic Applications** **R109**

V.S. Balderrama, J. Ferré-Borrull, J. Pallarés, and L.F. Marsal

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M. Hema Lata Rao, *Student Member IEEE* and Neti V.L.Narasimha Murty

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Didac Vega, Raúl Najar, María Pina, Ángel Rodríguez

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 Dept. of Electrical and Electronic Engineering, Bangladesh University of Engineering & Technology. India.
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E. Nogueira<sup>1</sup>, A. Fernandez<sup>1</sup>, A. Florez<sup>1</sup>, E. Mino<sup>2</sup>, R. Alvarez Santos<sup>1</sup> **R1**

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Departament d'Enginyeria Electrònica, Universitat Autònoma de Barcelona (UAB) 08193, Bellaterra, Spain.

**P.5.12.** *Electrical study of ScO<sub>x</sub>-based MIS structures using Al and Ti as gate electrodes* **R86**

H. García<sup>1</sup>, H. Castán<sup>1</sup>, S. Dueñas<sup>1</sup>, L. Bailón<sup>1</sup>, P. C. Feijoo<sup>2</sup>, M. A. Pampillon<sup>2</sup>, and E. San Andrés<sup>2</sup>

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<sup>2</sup> Departamento de Física Aplicada III (Electricidad y Electrónica). Facultad de Ciencias Físicas. Universidad Complutense de Madrid. 28040, Madrid, Spain.

**P.5.13.** *SiO<sub>x</sub>/SiO<sub>2</sub> superlattices for photovoltaic applications: structural and electro-optical properties* **R87**

J. López-Vidrier<sup>1</sup>, S. Hernández<sup>1</sup>, O. Blázquez<sup>1</sup>, D. Hiller<sup>2</sup>, S. Gutsch<sup>2</sup>, M. Schnabel<sup>3</sup>, P. Löper<sup>3</sup>, L. López-Conesa<sup>2</sup>, S. Estradé<sup>1,4</sup>, F. Peiró<sup>1</sup>, S. Janz<sup>3</sup>, M. Zacharias<sup>2</sup> and B. Garrido<sup>1</sup>

<sup>1</sup>MIND-IN<sup>2</sup>UB, Departament d'Electrònica, Universitat de Barcelona, Martí i Franquès 1, E-08028, Barcelona, Spain.

<sup>2</sup>IMTEK, Faculty of Engineering, Albert-Ludwigs-University Freiburg, Georges-Köhler-Allee 103, 79110, Freiburg, Germany.

<sup>3</sup>Fraunhofer Institute for Solar Energy Systems ISE, Heidenhofstr. 2, 79110, Freiburg, Germany.

<sup>4</sup>TEM-MAT, CCiT-UB, Scientific and Technological Center - University of Barcelona, Solé i Sabarís 1, E-08028 Barcelona, Spain.



**P.5.14.** *Performance measurement of amorphous silicon modules under ambient conditions* **R92**

P. Otero<sup>1</sup>, J. Rodríguez<sup>1</sup>, C. Alberte<sup>1</sup>, E. Comesaña<sup>2</sup>, A. J. García Loureiro<sup>2</sup>, M. Vetter<sup>1</sup>

<sup>1</sup>T-Solar Global S.A., Dept. Technology, Development & Innovation, Parq. Tecnológico de Galicia, Rua de Vigo 5, E-32900 San Cibrao das Viñas (Ourense), Spain.

<sup>2</sup>Universidade de Santiago de Compostela, Departamento de Electrónica e Computación, 15782 Santiago de Compostela, Spain.

**P.5.15.** *An Experimental Study on Electrical Parameter Dispersion on Organic TFTs* **R119**

Rodrigo Picos<sup>1</sup>, Eugeni García-Moreno<sup>1</sup>, Magali Estrada<sup>2</sup>, Antonio Cerdeira<sup>2</sup>

<sup>1</sup>Electronic Engineering Group, Universitat de les Illes Balears, Spain.

<sup>2</sup>SEES, CINVESTAV-IPN, Mexico DF, Mexico.

19.30 h - 20.30 h

*Auditorium, Palacio de Congresos Conde Ansúrez, third floor*  
CLASSICAL MUSIC PERFORMANCE

21.30 h -

*"La Parrilla de San Lorenzo" restaurant*  
GALA DINNER

## **Thursday, Feb. 14, 2013**

8.00 h – 10.05 h

*Palacio de Congresos Conde Ansúrez, third floor*  
**SESSION 4: Emerging devices**  
**Chairperson: Prof. María J. Martín**

8.00 h – 8.25 h

**0.4.1. Invited:** *Metamaterials, a chance for High Frequency Electronics?*

José Represa, A. C. López, I. Barba and A. Grande.

Departamento de Electricidad y Electrónica. Facultad de Ciencias. Universidad de Valladolid.

8.25 h – 8.45 h

**0.4.2.** *DC and AC characterization of PTFT inverters using Poly(9,9-dioctylfluorene-co-bithiophene) (F8T2).* **R12**

M. F. Ávila<sup>1</sup>, L. Reséndiz<sup>2</sup>, M. Estrada<sup>1</sup>, A. Cerdeira<sup>1</sup>

<sup>1</sup>Sección de Electrónica de Estado Sólido, Depto. Ingeniería Eléctrica, CINVESTAV-IPN, México D.F. 07360, México.

<sup>2</sup>Sección de Estudios de Posgrado e Investigación, UPIITA-IPN, México D.F. 07340, México.

8.45 h - 9.05 h

**0.4.3.** *SnO<sub>2</sub>-based TFTs fabricated by inkjet printing*

**R114**

Anna Vilà, Luís Portilla, Juan Ramón Morante<sup>1</sup>

Materials Electrònics i Energia – M-2E, Electronics Department, Martí i Franqués 1, 2<sup>a</sup> planta, 08028-Barcelona, Spain.

<sup>1</sup>Institut per a la Recerca en Energia de Catalunya – IREC, Jardins de les Dones de Negre 1, 2<sup>a</sup> planta, 08930-Sant Adrià de Besòs, Spain.

9.05 h - 9.25 h

**0.4.4.** *Terahertz detection using Si-SiGe MODFETs*

**R72**

Y.M. Meziani<sup>1</sup>, E. García-García<sup>2</sup>, J.E. Velázquez-Pérez<sup>1</sup>, D. Coquillat<sup>3</sup>, N. Dyakonova<sup>3</sup>, W. Knap<sup>3</sup>, I. Grigelionis<sup>4</sup>, K. Fobelets<sup>5</sup>

<sup>1</sup>Dpto. de Física Aplicada, Universidad de Salamanca, E-37008 Salamanca, Spain

<sup>2</sup>Centro de Láseres Pulsados (CLPU), Salamanca, Spain

<sup>3</sup>Laboratoire Charles Coulomb, UMR 5221 CNRS-Université Montpellier 2, Montpellier 34095, France.

<sup>4</sup>Institute of Experimental Physics, University of Warsaw, 00-681 Warsaw, Poland

<sup>5</sup>Department of Electrical and Electronic Engineering, Imperial College, London SW7 2AZ, UK.

9.25 h - 9.45 h

**0.4.5.** *2D atomic plane crystals based field-effect transistors*

**R35**

David Jiménez

Departament d'Enginyeria Electrònica, Escola d'Enginyeria, Universitat Autònoma de Barcelona

9.45 h - 10.05 h

**0.4.6.** *Metal oxide nanowires as building blocks for light detectors, gas sensors and biosensors.*

**R107**

J. L. Pau, C. García Nuñez, A. García Marín, E. Ruiz, J. Piqueras

Laboratorio de Microelectrónica, Dpto. Física Aplicada, Facultad de Ciencias, Universidad Autónoma de Madrid, c/Fco. Tomás y Valiente 7, Madrid 28049, Spain.

10.05 h - 10.30 h

COFFEE BREAK

10.30 h - 12.35 h

*Auditorium, Palacio de Congresos Conde Ansúrez, third floor*

**SESSION 5: Characterization and reliability**

**Chairperson: Prof. Francesca Peiró**

10.30 h - 10.55 h

**0.5.1. Invited:** *Failure analysis of MIS/MIM structures using spatial statistics*

Enrique Miranda.

Departament d'Enginyeria Electrònica, Universitat Autònoma de Barcelona.

10.55 h – 11.15 h

**0.5.2.** *Thin film YSZ solid state electrolyte characterization performed by electrochemical impedance spectroscopy* **R8**

Lander Rojo, Gemma G<sup>a</sup> Mandayo and Enrique Castaño

Microelectronics and Microsystems Unit, CEIT and TECNUN (University of Navarra)

Paseo Manuel de Lardizábal 15, 200018, San Sebastián, Spain.

11.15 h – 11.35 h

**0.5.3.** *Improving Yield on RF-CMOS ICs* **R40**

Amparo Herrera, Yolanda Jato

Department of Communications Engineering, Universidad de Cantabria, Santander, Spain.

11.35 h – 11.55 h

**0.5.4.** *EEL spectroscopic tomography: a new dimension to nanomaterials analysis*

Lluís Yedra<sup>1,2</sup>, Alberto Eljarrat<sup>1</sup>, Raúl Arenal<sup>3,4</sup>, Eva Pellicer<sup>5</sup>, Moisés Cabo<sup>5</sup>, Alberto López-Ortega<sup>6</sup>, Marta Estrader<sup>6</sup>, Jordi Sort<sup>7</sup>, Maria Dolors Baró<sup>5</sup>, Sònia Estradé<sup>1,2</sup>, Francesca Peiró<sup>1</sup> **R52**

<sup>1</sup>Laboratory of Electron Nanoscopies (LENS)-MIND/IN2UB, Dept. d'Electrònica, Universitat de Barcelona, c/ Martí Franquès 1, E-08028 Barcelona, Spain.

<sup>2</sup>CCiT, Scientific and Technological Centers, Universitat de Barcelona, C/Lluís Solé i Sabaris 1, E-08028 Barcelona, Spain.

<sup>3</sup>Laboratorio de Microscopias Avanzadas (LMA), Instituto de Nanociencia de Aragon (INA), Universidad de Zaragoza, E-50018 Zaragoza, Spain.

<sup>4</sup>Fundacion ARAID, E-50004 Zaragoza, Spain.

<sup>5</sup>Departament de Física, Facultat de Ciències, Universitat Autònoma de Barcelona, E-08193 Bellaterra, Spain.

<sup>6</sup>CIN2(CIN-CSIC) and Universitat Autònoma de Barcelona, Catalan Institute of Nanotechnology, Campus de la UAB, E-08193 Bellaterra, Spain.

<sup>7</sup>Institució Catalana de Recerca i Estudis Avançats (ICREA), Departament de Física, Facultat de Ciències, Universitat Autònoma de Barcelona, E-08193 Bellaterra, Spain.

11.55 h – 12.15 h

**0.5.5.** *Modeling of BTI related time-dependent variability* **R83**

J. Martin-Martinez, N. Ayala, R. Rodriguez, M. Nafria and X. Aymerich

Departament d'Enginyeria Electrònica, Universitat Autònoma de Barcelona (UAB) 08193, Bellaterra, Spain.

12.15 h - 12.35 h

**O.5.6.** *Er-doped Si-based electroluminescent capacitors: Role of different host matrices on the electrical and luminescent properties* **R88**

Y. Berencén,<sup>1</sup> J. M. Ramírez,<sup>1</sup> B. Garrido<sup>1</sup>

<sup>1</sup>MIND-IN2UB, Dept. Electrònica, Universitat de Barcelona, Martí i Fanquès 1, 08028, Barcelona, Spain.

**12.35 h - WORKSHOP: SOLAR ENERGY**

12.35 h - 14.00 h *Palacio de Congresos Conde Ansúrez, second floor*  
**POSTER - SESSION 6: Solar Energy: thermal and photovoltaic devices**

**P.6.1.** *Deep level defects on mono-like and polycrystalline silicon solar cells* **R2**

E. Pérez<sup>1</sup>, H. García<sup>1</sup>, H. Castán<sup>1</sup>, S. Duenas<sup>1</sup>, L. Bailón<sup>1</sup>, B. Moralejo<sup>2</sup>, O. Martínez<sup>2</sup>, J. Jiménez<sup>2</sup> and V. Parra<sup>3</sup>

<sup>1</sup>Dept. de Electricidad y Electrónica, Universidad de Valladolid, ETSI Telecomunicación, Paseo de Belén 15, 47011 Valladolid, Spain.

<sup>2</sup>Dept. de Física de la Materia Condensada, Universidad de Valladolid, I+D building, Paseo de Belén 11, 47011 Valladolid, Spain.

<sup>3</sup>DC Wafers Investments, S.L. Ctra Madrid km 320. 24227 Valdelafuente, León.

**P.6.2.** *Method for estimating the cell temperature of a HCPV one-cell module based on the open circuit voltage.* **R14**

Eduardo F. Fernández<sup>1</sup>, A. J. García Loureiro<sup>2</sup>, F. Almonacid<sup>1</sup>, P. Rodrigo<sup>1</sup>, Pedro J. Pérez Higuera<sup>1</sup>, G. Almonacid<sup>1</sup>.

<sup>1</sup>Centre of Advanced Studies in Energy and Environment, University of Jaén, Spain.

<sup>2</sup>University of Santiago de Compostela, Santiago de Compostela.

**P.6.3.** *Influence of cathode in organic solar cells performance* **R17**

G. del Pozo, B. Romero and B. Arredondo.

Electronic Technology Dept., Universidad Rey Juan Carlos, C/ Tulipán s/n, 28933, Móstoles, Madrid.

**P.6.4.** *Low cost spray-coating boron diffusion on n-type silicon* **R18**

Elena Navarrete Astorga, Efraín Ochoa Martínez, José R. Ramos Barrado

Laboratorio de Materiales y Superficies (unidad asociada al CSIC), Facultad de Ciencias, Universidad de Málaga, Spain.

**P.6.5.** *Boron diffused emitters passivated with Al<sub>2</sub>O<sub>3</sub> films* **R24**  
G. Masmitja, P. Ortega, G. López, E. Calle, M. Garcia, I. Martin, A. Orpella, C. Voz, R. Alcubilla.

Universitat Politècnica de Catalunya UPC. C/ Jordi Girona 1-3, Modulo C-4, 08034 Barcelona, Spain.

**P.6.6.** *An IBC solar cell for the UPC CubeSat-1 mission* **R26**  
P. Ortega, R. Jove-Casulleras, A. Pedret, R. González, G. López, I. Martín, M. Domínguez, R. Alcubilla, A. Camps.

Universitat Politècnica de Catalunya UPC. C/ Jordi Girona 1-3, Modulo C-4, 08034 Barcelona, Spain.

**P.6.7.** *Hydrogenated amorphous silicon deposited by high pressure sputtering for HIT solar cells* **R32**

R.García-Hernansanz<sup>1</sup>, E.García-Hemme<sup>1,2</sup>, J.Olea<sup>3,2</sup>, D.Pastor<sup>1,2,3</sup>, A.delPrado<sup>1</sup>, I.Mártil<sup>1</sup>, G. González-Díaz<sup>1</sup>, F.J. Ferrer<sup>4</sup>.

<sup>1</sup>Dpto. Física Aplicada III, Univ. Complutense de Madrid,

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<sup>3</sup>Instituto de Energía Solar, E.T.S.I. Telecomunicación, Univ. Politécnica de Madrid

<sup>4</sup>Centro Nacional de Aceleradores, Universidad de Sevilla-CSIC

**P.6.8.** *High efficient thin film CdTe solar cells* **R36**

Zhizhong Bai<sup>1</sup>, Ruilong Yang<sup>1</sup>, Deliang Wang<sup>2</sup>

<sup>1</sup>Hefei National Laboratory for Physical Sciences at the Microscale, and

<sup>2</sup>CAS Key Laboratory of Energy Conversion Materials, University of Science and Technology of China, Hefei, Anhui, People's Republic of China.

**P.6.9.** *Progress in Silicon Heterojunction Solar Cell fabrication with rear laser-fired contacts.* **R46**

A. Morales-Vilches, C. Voz, M. Colina, G. López, I. Martín, A. Orpella, J. Puigdollers, M. García and R. Alcubilla.

Grup de recerca en Micro i Nanotecnologies, Departament d'Enginyeria Electrònica, Universitat Politècnica Catalunya.

**P.6.10.** *Photocurrent measurements for solar cells characterization* **R60**

E. Pérez, M. Maestro, H. García, H. Castán, S. Dueñas and L. Bailón

Dept. de Electricidad y Electrónica, Universidad de Valladolid, E.T.S.I. Telecomunicación, Paseo de Belén 15, 47011 Valladolid, Spain.

**P.6.11.** *Low-Cost system for characterizing full-wafer photoluminescence in silicon photovoltaic* **R61**

B. Moralejo<sup>1</sup>, A. Tejero<sup>1</sup>, O. Martínez<sup>1</sup>, J. Jiménez<sup>1</sup>, V. Parra<sup>2</sup>

<sup>1</sup>GdS – Optronlab, Dpto. Física de la Materia Condensada, Edificio I+D, Univ. de Valladolid, Paseo de Belén 11, 47011, Valladolid (Spain).

<sup>2</sup>DC Wafers, Ctra. de Madrid, Km 320, 24227, Valdelafuente, León, (Spain).

**P.6.12.** *Influence of Hydrogen on the Optical absorption of GaAs(Ti) films deposited by R.F. sputtering.* **R76**

A. Boronat, S. Silvestre, L Castañer.

MNT- Electronic Engineering Department, Universitat Politècnica de Catalunya  
C/ Jordi Girona 1-3, Campus Nord UPC, 08034 Barcelona, Spain.

**P.6.13.** *Silicon Solar Cells for III-V on Silicon PV Integration* **R77**

Elisa García-Tabarés, Iván García, Diego Martín, Ignacio Rey-Stolle

<sup>1</sup>Instituto de Energía Solar – Universidad Politécnica de Madrid. Avda. Complutense 30 – 28040 Madrid (Spain).

<sup>2</sup>CES Felipe II – Universidad Complutense de Madrid – CL Capitán 39, 28300 Aranjuez, Madrid (Spain).

**P.6.14.** *Trapping activity on multicrystalline Si wafers studied by combining fast PL imaging and high resolved electrical techniques* **R81**

O. Martínez<sup>1</sup>, J. Mass<sup>2</sup>, B. Moralejo<sup>1</sup>, V. Hortelano<sup>1</sup>, A. Tejero<sup>1</sup>, J. Jiménez<sup>1</sup>, V. Parra<sup>3</sup>

<sup>1</sup>GdS-Optronlab, Dpto. Física Materia Condensada, Parque Científico Univ. de Valladolid, 47011 Valladolid (Spain).

<sup>2</sup>Departamento de Física: Grupo de Física Aplicada, Universidad del Norte, Km. 5-Vía Puerto Colombia, Barranquilla, Colombia.

<sup>3</sup>DC-Wafers Investments, S.L. Ctra. de Madrid, Km. 320, 24227 Valdelafuente, León, Spain.

**P.6.15.** *Modification of the properties of CdS and CdTe films grown by close space vapour sublimation for solar cell applications* **R82**

J. L. Plaza<sup>1</sup>, S. Rubio<sup>1</sup>, O. Martínez<sup>2</sup>, V. Hortelano<sup>2</sup>, E. Diéguez<sup>1</sup>

<sup>1</sup> Laboratorio de Crecimiento de Cristales, Departamento de Física de Materiales, Facultad de Ciencias, Universidad Autónoma de Madrid.

<sup>2</sup>GdS-Optronlab, Dpto. Física Materia Condensada, Parque Científico Univ. de Valladolid, 47011 Valladolid (Spain).

**P.6.16.** *Finite-Element Modeling of Interdigitated Heterojunction Organic Photovoltaic Devices* **R84**

P. Granero, V. S. Balderrama, J. Ferré-Borrull, J. Pallarès, and L. F. Marsal

Nano-electronic and Photonic Systems (NePhoS), Department of Electronic, Electrical and Automatic Control Engineering, Universitat Rovira i Virgili, Av. Països Catalans 26 43007, Tarragona, Spain.



**P.6.17.** *Influence of exciton blocking layer in small molecule organic solar cells*

S. Galindo<sup>1</sup>, M. Ahmadpour<sup>1</sup>, A. Marsal<sup>1</sup>, Vikas L.S.<sup>2</sup>, C. Voz<sup>1</sup>, J. Puigdollers<sup>1</sup> **R89**

<sup>1</sup>Grup de recerca en Micro i Nanotecnologies, Departament d'Enginyeria Electrònica, Universitat Politècnica Catalunya. c/ Jordi Girona 1-3, Campus Nord – C4, 08034 Barcelona.

<sup>2</sup>Nanophotonic & Optoelectronic Devices Laboratory, Department of Physics, Cochin University of Science and Technology, Kochi-22, India

**P.6.18.** *Influence of the Blend Concentration on the Performances of PTB1: PCBM BHJ Solar Cells.* **R90**

P.L. Han, V.S. Balderrama, M. Alba, P. Formentin, J. Pallarés and L.F. Marsal  
Departament d'Enginyeria Electrònica, Elèctrica i Automàtica, Universitat Rovira i Virgili, Av. Paisos Catalans 26, 43007 Tarragona, Spain.

**P.6.19.** *Ab initio study of the defect states at a-Si:H/c-Si interfaces* **R91**

Iván Santos<sup>1</sup>, Marco Cazzaniga<sup>2</sup>, Bénédicte Demaurex<sup>3</sup>, Stefaan De Wolf<sup>3</sup>, Giovanni Onida<sup>2</sup>, and Luciano Colombo<sup>4</sup>

<sup>1</sup>Departamento de Electricidad y Electrónica, Universidad de Valladolid, Spain.

<sup>2</sup>European Theoretical Spectroscopy Facility and Dipartimento di Fisica, Università degli Studi di Milano, Italy.

<sup>3</sup>Institute of Microengineering, Photovoltaics and Thin Film Electronic Laboratory, Ècole Polytechnique Fédérale de Lausanne, Swizerland.

<sup>4</sup>Dipartimento di Fisica, Università degli Studi di Cagliari, Italy.

**P.6.20.** *Development of a very fast spectral response measurement system for measurement of silicon thin film modules* **R97**

J. A. Rodríguez, M. Vetter, M. Fortes, C. Alberte, P. Otero

Dept. Technology, Development & Innovation. T-Solar Global S.A.

Parque Tecnológico de Galicia, Avda. de Vigo 5, E-32900 San Cibrao das Viñas (Ourense), Spain.

**P.6.21.** *Simulation of a-Si:H/a-Si:H Tandem Solar Cells* **R103**

A. Garcia-Rivera<sup>1</sup>, E. Comesaña<sup>1</sup>, J.A. Rodríguez<sup>2</sup>, A. J. Garcia-Loureiro<sup>1</sup>, and M. Vetter<sup>2</sup>

<sup>1</sup>Centro Singular de Investigación en Tecnoloxías da Información (CITIUS), Rúa Jenaro de la Fuente Domínguez s/n, Universidade de Santiago de Compostela (USC) – Campus Vida, 15782 – Santiago de Compostela, España.

<sup>2</sup>Dept. de Tecnología, Innovación &Desarrollo de T-Solar Global S.A., San Cibrao das Viñas (Ourense), España.

**P.6.22.** *Electrical properties of silicon supersaturated with titanium or vanadium for intermediate band material.* **R34**

E. García-Hemme<sup>1,2</sup>, R. García-Hernansanz<sup>1,2</sup>, J. Olea<sup>2,3</sup>, D. Pastor<sup>1,2,3</sup>, I. Mártil<sup>1,2</sup>, G. González-Díaz<sup>1,2</sup>, P. Wahnón<sup>2,3,4</sup>

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<sup>2</sup>CEI Campus Moncloa, UCM-UPM, 28040 Madrid, Spain.

<sup>3</sup>Instituto de Energía Solar, E.T.S.I. de Telecomunicación, Univ. Politécnica de Madrid. 28040 Madrid, Spain.

<sup>4</sup>Departamento de Tecnologías Especiales, ETSI Telecomunicación and Instituto de Energía Solar, UPM, Ciudad Universitaria, Madrid 28040, Spain.

14.00 h – 15.30 h      LUNCH

15.30 h – 16.15 h      **PLENARY TALK: Prof. Pilar Espinet, IES-UPM**

16.15 h – 18.15 h      Auditorium, Palacio de Congresos Conde Ansúrez, third floor  
**SESSION 6. Solar Energy: thermal and photovoltaic devices**  
**Chairperson: Prof. Ramón Alcubilla**

16.15 h – 16.35 h

**0.6.1. Invited:** *Wide Band Gap Power Semiconductor Devices*

José Millán and Philippe Godignon

IMB-CNM-CSIC, Campus Universidad Autónoma de Barcelona, 08193 Bellaterra, Barcelona.

16.35 h – 16.55 h

**0.6.2. Invited:** *Sliding mode control-based maximum power point tracking for interconnected converters in photovoltaic systems*

Luis Martínez-Salamero

Universidad Rovira i Virgili, Tarragona.

16.55 h – 17.15 h

**0.6.3. Invited:** *The intermediate band approach in the third solar cell generation context*

Germán González-Díaz<sup>1,2</sup>, I. Mártil<sup>1,2</sup>, A. del Prado<sup>1,2</sup>, D. Pastor<sup>1,2,3</sup>, J. Olea<sup>2,3</sup>, E. García-Hemme<sup>1,2</sup>, R. García-Hernansanz<sup>1,2</sup>, P. Wahnón<sup>2,3,4</sup>

<sup>1</sup>Dpto. de Física Aplicada III (Electricidad y Electrónica), Facultad de Ciencias Físicas, Universidad Complutense de Madrid, 28040 Madrid, Spain.

<sup>2</sup>CEI Campus Moncloa, UCM-UPM, 28040 Madrid, Spain.

<sup>3</sup>Instituto de Energía Solar, E.T.S.I. de Telecomunicación, Univ. Politécnica de Madrid. 28040 Madrid, Spain.

<sup>4</sup>Departamento de Tecnologías Especiales, ETSI Telecomunicación and Instituto de Energía Solar, UPM, Ciudad Universitaria, Madrid 28040, Spain.

17.15 h – 17.35 h

**O.6.4. Invited:** *The role of defects in solar cells: Control and detection*

Salvador Dueñas, E. Pérez, H. Castán, H. García, and L. Bailón.

Departamento de Electricidad y Electrónica. E.T.S. de Ingenieros de Telecomunicación. Universidad de Valladolid.

17.35 h – 17.55 h

**O.6.5. Invited:** *Trends in crystalline growth of low cost and efficient photovoltage cells*

Vicente Parra, Ismael Guerrero, Teresa Carballo, David Cancillo, Andrés Black.

DC Wafers Investments, S.L. Ctra Madrid km 320. 24227 Valdelafuente, León.

17.55 h – 18.15 h

**O.6.6. Invited:** *Degradation signatures of high-power laser diodes*

Juan Jiménez, J. Anaya, V. Hortelano, J. Souto, A. Martín

Departamento de Física de la Materia Condensada, I+D building, Paseo de Belén 11, 47011. Universidad de Valladolid.

18.15 h – 18.30 h      COFFEE BREAK

18.30 h – 19.45 h

*Auditorium, Palacio de Congresos Conde Ansúrez, third floor*

**ROUND TABLE. Prof. Juan Jiménez**, Univ. Valladolid. *Chair*

Dr. Pedro Gago: [Cidersol Tecnología Solar, S.L.](#)

Dr. Alfonso Calderón: [Cenit Solar](#)

Dr. Teodosio del Caño: [Onyx Solar](#)

Dr. Vicente Parra: [DC Wafers](#)

19.45 h – 20.00 h

*Auditorium, Palacio de Congresos Conde Ansúrez, third floor*

CLOSING REMARKS





# 9<sup>th</sup> Spanish Conference on Electron Devices

Valladolid, 12-14 February 2013



- Presentation
- Final Papers submission
- Preliminary program
- Registration
- Contributions list
- Important dates
- Committees
- Topic areas
- Conference venue
- Sponsors and exhibitors
- Authors Information
- EDS Mini Colloquium
- FAQs



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12-14 February 2013. Valladolid

## NEWS

- Registration opened 02/11/2012
- FAQs 24/10/2012
- Abstract deadline extended to Tuesday, October 30th, 2012 09/10/2012
- Venue 02/03/2012
- Dates 01/03/2012

ResearchGate

[www.cde2013.es](http://www.cde2013.es)