



CURRICULUM VITAE (CVA)

IMPORTANT – The Curriculum Vitae cannot exceed 4 pages. Instructions to fill this document are available in the website.

Part A. PERSONAL INFORMATION

CV date 31/05/2023

First name	FRANCISCO		
Family name	JIMÉNEZ MOLINOS		
Gender (*)		Birth date (dd/mm/yyyy)	
Social Security, Passport, ID number			
e-mail		URL Web	
Open Researcher and Contributor ID (ORCID) (*)			

(*) Mandatory

A.1. Current position

Position	Tenured professor		
Initial date	19/01/2010		
Institution	University of Granada		
Department/Center	Electronics and Computer Technology		
Country	Spain	Teleph. number	+34 958241000-20380
Key words	Electronics, semiconductor materials, electron devices and circuits, compact modeling, physical simulation		

A.2. Previous positions (research activity interruptions, art. 14.2.b))

Period	Position/Institution/Country/Interruption cause
26/02/2002 – 18/01/2010	Associated professor
01/01/1999 – 25/02/2002	PhD Student

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Degree in Physics	Granada University (Spain)	1998
Electronics Engineer	Granada University (Spain)	2000
PhD	Granada University (Spain)	2002

Part B. CV SUMMARY (max. 5000 characters, including spaces)

Since 1999, the year I joined to the Department of Electronics at the University of Granada as a Ph.D. student, I have carried out an intense research activity, mainly focused on the simulation and modelling of electronic devices. As part of my doctoral thesis, I developed several models and simulators for calculating tunnel currents through thin dielectric films, considering several transport mechanisms. These works had a noticeable impact, as the high number of cites of the related papers reveals (and, nowadays, they are still being cited). Furthermore, one of the models was included in the well-known MINIMOS-NT simulator (TU Wien). Later, I was involved in the study of the electron mobility in SOI MOSFETs, with special emphasis on the characterization of coulomb scattering processes.

In 2012, I participated in the start of a new research topic in our group, devoted to resistive switching devices and memristors. Since then, my research activity is linked to the

development of simulators and compact models for these devices. In this subject, I have co-supervised 3 Ph.D. thesis and published 44 papers in JCR journals and 18 contributions to conferences or workshops. This research activities have been supported by two projects funded by the Spanish Government and one project funded by the Junta de Andalucía. In all of these projects, I have played the role of co-director, in collaboration with Professor Juan B. Roldán Aranda. The national projects have been coordinated with Universidad de Valladolid and Instituto de Microelectrónica de Barcelona (the second one, also in collaboration with Universidad Autónoma de Barcelona). My current research interests include physically based simulation of memristive devices and compact modelling of these devices for circuit simulation purposes, with special emphasis in neuromorphic applications.

From the beginning, my research activity has been carried out in an international context. I have carried out two stays in foreign institutions (for two months in Institute for Microelectronics of TU Wien and for one month in Institute of Microelectronics and Photonics, IMEP, in Grenoble). As a consequence, I published several papers in collaborations with Dr. Siegfried Selberherr and Dr. Andreas Gehring (TU Wien). Recently, in summer 2019, I visited for three days the research center IHP (Frankfurt-Oder, Germany), with the aim of strengthening the collaboration with its researchers. As a result, we have published several papers in journals and conferences in cooperation with Dr. Eduardo Pérez and Dr. Christian Wenger (IHP). In addition, we have collaborated (and published together) with researchers from several external institutions, such as Institute of Microelectronics (Beijing, China), Universidad Autónoma de Barcelona (Spain), Centro Nacional de Microelectrónica (CNM-Barcelona, Spain), Universidad de Valladolid (Spain) and Universidad de las Islas Baleares (Spain).

I have coordinated a project funded by the Company Valeo Lighting Systems, for the development of an automatic measurement system for characterization of stability in feedback linear circuits. I have also collaborated within a project in collaboration with the Company DHV Tecnología Espacial Avanzada Malagueña and leaded by Professor Andrés M. Roldán (University of Granada, Spain).

Finally, I have 3 periods of six-years research recognized by the CNEAI.

Part C. RELEVANT MERITS (*sorted by typology*)

C.1. Publications (*see instructions*)

Google scholar profile: <https://scholar.google.es/citations?user=0GcuE-wAAAAJ&hl=es>

1. Juan B. Roldán (CA), G. González-Cordero, R. Picos, ...F. Jiménez-Molinos (6/14), and L.O. Chua, "On the thermal models for resistive random access memory circuit simulation", *Nanomaterials*, vol. 11, 1261, 2021.
2. D. Maldonado, M.B. González, F. Campabadal, F. Jiménez-Molinos, M.M. Al-Chawa, S. G. Stavrinides, J.B. Roldán, R. Tetzlaff, R. Picos, L.O. Chua, "Experimental evaluation of the dynamic route map in the reset transition of memristive ReRAMs", *Chaos, Solitons & Fractals*, vol. 139, p. 110288, 2020.
3. S. Aldana, E. Pérez, F. Jiménez-Molinos, C. Wenger, J.B. Roldán, "Kinetic Monte Carlo Analysis of data retention in Al:HfO₂-based resistive random access memories", *Semiconductor Science and Technology*, Volume 35, 115012, 2020.
4. G. González-Cordero, M.B. González, A. Morell, F. Jiménez-Molinos, F. Campabadal, J.B. Roldán, "Neural network based analysis of random telegraph noise in resistive random access memories", vol. 35, p. 025021, 2020.
5. D. Barrera, M.J. Ibáñez, F. Jiménez-Molinos, A.M. Roldán, J.B. Roldán, "A spline quasi-interpolation based method to obtain the reset voltage in Resistive RAMs in the Charge-Flux domain", *Journal of Computational and Applied Mathematics*, 354, pp. 326-333, 2019.

6. C. Acal, J.E. Ruiz-Castro, A. M. Aguilera, F. Jiménez-Molinos, J.B. Roldán, “Phase-type distributions for studying variability in resistive memories”, *Journal of Computational and Applied Mathematics*, 345, pp. 23–32, 2019.
7. G. González-Cordero, M.B. González, F. Jiménez-Molinos, F. Campabadal, J.B. Roldán, “New method to analyze random telegraph signals in resistive random access memories”, *Journal of Vacuum Science & Technology B*, vol. 37, p. 012203, 2019.
8. G. González-Cordero, J.B. Roldán, F. Jiménez-Molinos, J. Suñé, S. Long, M. Liu, “A new compact model for bipolar RRAMs based on truncated-cone conductive filaments: a Verilog-a approach”, *Semiconductor Science and Technology*, vol. 31, p. 115013, 2016.
9. F. Jiménez-Molinos, M.A. Villena, J.B. Roldán, A.M. Roldán, “A SPICE compact model for unipolar RRAM reset process analysis”, *IEEE Transactions on Electron Devices*, vol. 62, p. 955, 2015.
10. M.A. Villena, F. Jiménez-Molinos, J.B. Roldán, J. Suñé, S. Long, X. Lian, F. Gámiz, M. Liu, “An in-depth simulation study of thermal reset transitions in resistive switching memories”, vol. 114, p. 144505, 2013.

C.2. Congress

1. J. B. Roldán, D. Maldonado, A. M. Roldán, F. Hui, Y. Shi, F. Jiménez-Molinos, F.J. Alonso, A.M. Aguilera and M. Lanza, “Time series modeling of the cycle-to-cycle variability in h-BN based memristors”, 2021 IEEE International Reliability Physics Symposium, Monterey, California (USA), March 21 – 25, 2021.
2. G. González-Cordero, M. B. González, M. Zabala, K. Kalam, A. Tamm, F. Jiménez-Molinos, F. Campabadal, J. B. Roldán, “Study of RTN signals in resistive switching devices based on neural networks”, 22th Conference on Insulating Films on Semiconductors, Rende (Italia), June 28-July 2, 2021.
3. F. Jiménez-Molinos, H. García, M.B. González, S. Dueñas, H. Castán, E. Miranda, F. Campabadal and J.B. Roldán, “Fabrication, characterization and modeling of TiN/Ti/HfO₂/W memristors: programming based on an external capacitor discharge”, 13th Spanish Conference on Electron Devices (CDE), Seville (Spain), June 9 – 11, 2021.
4. J. B. Roldán, D. Maldonado, F. Jiménez-Molinos, C. Acal, J.E. Ruiz-Castro, A.M. Aguilera, F. Hui, J. Kong, Y. Shi, X. Jing, C. Wen, M.A. Villena and M. Lanza, “Reversible dielectric breakdown in h-BN stacks: a statistical study of the switching voltages”, 2020 IEEE International Reliability Physics Symposium, Grapevine, Texas, (USA), March 29 – April 2, 2020.
5. A.J. Pérez-Ávila, G. González-Cordero, E. Pérez, E. Pérez-Bosch Quesada, M.K. Mahadevaiah, Ch. Wenger, J.B. Roldán and F. Jiménez-Molinos, “Behavioral modeling of multilevel HfO₂-based memristors for neuromorphic circuit simulation”, XXXV Conference on Design of Circuits and Integrated Systems (DCIS), Segovia (Spain), November 18 – 20, 2020.
6. M. B. Gonzalez, M. Maestro-Izquierdo, F. Campabadal, S. Aldana, F. Jimenez-Molinos, J. B. Roldan, “Impact of Intrinsic Series Resistance on the Reversible Dielectric Breakdown Kinetics in HfO₂ Memristors”, 2020 IEEE International Reliability Physics Symposium, Grapevine, Texas, (USA), March 29 – April 2, 2020.
7. G. González-Cordero, M.B. González, F. Campabadal, F. Jiménez-Molinos, J.B. Roldán, “A new technique to analyze RTN signals in resistive memories”, 21st biennial Conference Insulating Films of Semiconductors (INFOS), Cambridge (UK), June 30 – July 3, 2019.

C.3. Research projects

Participation as coordinator (co-IP)

1.-Title: "Fabrication, characterization, simulation, modelling and applications of resistive switching devices" (TEC2017-84321-C4-3-R).

Institution: Ministerio de Ciencia, Innovación y Universidades

Time: 01/01/2018-31/09/2021, budget: 114950 €, status: finished.

2.-Title: "Multidisciplinary study of thermal and magnetic effects, and noise in metallic oxide and organic based memristors for non-volatile memories and neuromorphic circuits" (A-TIC-117-UGR18).

Institution: Junta de Andalucía

Time: 01/01/2020-31/06/2022, budget: 37150 €, status: ongoing.

3.-Title: "Fabrication, characterization and simulation of resistive switching devices based on high-k dielectrics" (TEC2014-52152-C3-2-R)

Institution: Ministerio de Economía y Competitividad

Time: 01/01/2015-31/12/2018, budget: 58100 €, status: finished.

Participation in the research team

4.- Title: "Familia A-RAM: en busca de la celda de memoria universal." (TEC2011-28660)

Institution: Ministerio de Ciencia e Innovación.

Time, 01/01/2012-31/12/2014, Budget: 96800 €, status: finished.

Coordinator: Francisco J. Gámiz Pérez (Universidad de Granada).

C.4. Contracts, technological or transfer merits

1.-Title: Development of solar cell panels for cubesats and small satellites: design, fabrication, characterization and validation (DEEPSAT RTC-2016-4644-3)

Institution: Ministerio de Economía y Competitividad (Proyectos Retos-Colaboración)

Budget: 92000 €, time: 01/01/2017–31/12/2018

Coordinator: Andrés Roldán Aranda (Universidad de Granada)

Company: DHV TECNOLOGÍA ESPACIAL AVANZADA MALAGUEÑA, S.L.

2.- Title: Development of subsystem of power for CubeSats and nano-satellites (POWERNANOSAT) (CTA-16/903)

Institution: Corporación Tecnológica Andalucía (CTA)

Budget: 30000 €, time: 01/01/2017– 31/12/2018

Coordinator: Andrés Roldán Aranda (Universidad de Granada)

3.- Title: Development of an automatic system for measuring closed-loop gain and stability in feedback linear circuits.

Institution: Valeo lighting systems, S.A.

Budget: 1306.26 €, time: 01/06/2014– 31/07/2014

Coordinator: Francisco Jiménez Molinos (Universidad de Granada)