

CURRICULUM VITAE ABREVIADO (CVA)

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

Part A. PERSONAL INFORMATION

First name	José Ignacio		
Family name	Martínez		
Gender (*)	Male	Birth date	22/06/1979
ID number	12407687S		
e-mail	Joseignacio.martinez@icmm.csic.es	URL Web	https://wp.icmm.csic.es/esisna/jose-ignacio-martinez/
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-2086-8603		

(*) Mandatory

A.1. Current position

Position	Tenured CSIC Scientist		
Initial date	31/07/2020		
Institution	Consejo Superior de Investigaciones Científicas (CSIC)		
Department/Center	Low-dimensional systems	Instituto de Ciencia de Materiales de Madrid (ICMM)	
Country	Spain	Teleph. number	913349095
Key words			

A.2. Previous positions (research activity interruptions, indicate total months)

Period	Position/Institution/Country/Interruption cause
2003-2007	FPI Fellow at Facultad de Ciencias (UVA), Spain
2007-2009	Postdoctoral researcher at CAMD-DTU, Denmark
2009-2013	Postdoctoral researcher at Facultad de Ciencias (UAM), Spain (including a JdC Fellowship)
2013-2020	Postdoctoral researcher at ICMM-CSIC, Spain (including JaeDOC and RyC Fellowships)
2020-present	Tenured CSIC Scientist

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Theoretical Physics	University of Valladolid / Spain	2007
Advanced Studies Diploma	University of Valladolid / Spain	2004
Degree in Physics	University of Valladolid / Spain	2002

Part B. CV SUMMARY

Tenured CSIC Scientist at the ICMM-CSIC (Madrid) since 2020. Bachelor in Physics at University of Valladolid (UVA), 2002. PhD summa cum laude in Physics (J. A. Alonso's group: catalytic, mechanical and photoresponse properties of small metal and organometallic clusters) at UVA, 2007. Post-doctoral positions in prestigious Research Groups of Catalysis and Surface Science: FP7 post-doc at CAMD-DTU (Denmark), 2007-2009 (J. K. Nørskov's group: stability and catalytic properties of inexpensive catalysts); FP7 and JdC post-docs at the Autonomous University of Madrid (UAM), 2009-2013 (F. Flores' group: organic/inorganic interfaces). CSIC-JaeDOC scientist (2013-2015) at the ICMM-CSIC (Madrid) carrying out first-

principles simulations of low-dimensional systems to guide Surface Science experiments. Afterwards, I held a contracted scientist FC3 position associated to the ERC-Synergy NANOCOSMOS Project (15M€) at ICMN-CSIC, devoted to the first-principles-based simulation of the interaction of small nanoparticles with gas at the circumstellar environment. Ramón y Cajal fellowship (2017-2020) in the area of "Physics and Space Science" at ICMN/CSIC.

Throughout my research career, I've taken an interdisciplinary approach, combining chemistry, physics, and computational science to guide material science experimentalists efficiently. My research interests encompass three main branches. The first involves the "Theory and First-principles Simulation of Low-dimensional Functional Materials," focusing on developing theoretical tools, characterizing properties, and applying first-principles frameworks to various fields. The second branch is the "In-silico Design and Characterization of Novel Low-dimensional Functional Materials and Processes," covering diverse areas such as functionalization of graphene, TMDCs nanostructures, on-surface-driven formation of organic nanostructures, and advanced functional nanostructured catalysts. Finally, my overarching goal is "Developing Simple and Predictive First-principles-based Descriptors Across Dimensionality of Materials" to correlate different material properties.

Bibliometric Indicators. (ResearcherID: H-2645-2012 / Scopus Author ID: 27667815700 / ORCID: 0000-0002-2086-8603) I authorized >175 JCR articles (first/last and corresponding author in >50%) in the most relevant scientific journals of the field (>85% in Q1/ > 35% in D1), which have attracted > 9500(WoS)/12000(Google Scholar) citations, 18 artistic journal covers, 6 book chapters (one in a CRC Handbook of Nanophysics).

Academic Honors and Awards. 2007: Extraordinary PhD thesis award (UVA), 2015: Ramón y Cajal Fellowship (Spanish Ministry of Science and Technology). 3 six-year term periods (2003-2020) of research (sexenios) and 4 CSIC five-year term periods (2003-2018) of excellence (quinquenios).

Activity as supervisor. 2 TFG, 2TFM and 2 PhD students (running), 1 Postdoc.

Teaching. over 60 ECTS (~500 teaching hours validated by the ANECA) in courses of Physics and Chem. Eng. Degrees. Invited to teach a number of national and international master classes and post-degree courses (CNRS Nanotechnology Master Program, "Fronteras en Ciencia de Materiales"). Ad-honorem Professor at UAM since 2013; and accredited Professor (Assistant, Contracted and Private University Professor) by Spanish ANECA

Memberships of scientific societies and evaluation committees. Member of two specialized groups (GEFES and GEFAM) of the Spanish Royal Society of Physics (RSEF). Member of ASEVA. Experts panel of different scientific national agencies: ANEP and AEI (Spain), FWF (Austria) and ANPCyT (Argentina). Member of the scientific committee of the "European Workshop on Epitaxial Graphene and 2D Materials". Frequent referee for the most prestigious scientific editorials (Nature PG, APS, ACS, RSC, Wiley, IOP, Elsevier). Thesis examiner: 4 (Spain).

Collaborations. A wide network of national and international collaborations: F. Zamora's (UAM/Spain: 2D Coordination-polymers), M. Gottfried's (University of Marburg/Germany: Organic-oxide Interfaces), M.T.M Koper's (Leiden University/The Netherlands: Theoretical Electrochemistry), R.A. Bartynski's (University of New Jersey: Organometallic Interfaces), A. Zak's (HIT/Israel: Layered Materials: Hydrogen Storage), R. Fasel's (EMPA/Switzerland: On-surface Chemistry). J. Coraux (Neel Inst./France), among many others.

Participation in R&D+i projects. Participation and leading >25 R&D+i international, national and regional projects, including 3 FP7 and 1 ERC-Synergy (>15M€) European projects. In 2017, I coordinated my first PN researching project "Fun-LDS" (200.000 €) on functional low-dimensional materials for electrochemical (bio)sensors. I've attracted (as PI leading 6 R&D+i projects) > 1.500.000€ of research funding.

Scientific management. Currently, I am head of the Dept. of Low-dimensional Materials and executive member of the IA commission within the ICMN-CSIC.

Contracts, technological or transfer merits. Co-inventor of 1 National and 1 European patent. Additionally, I've engaged in technological and knowledge transfer activities with various enterprises (DYNASOL S.L.) and coordinated numerous scientific divulgation and outreach activities.

Facilities. Setting up of High-performance Scientific Computing Clusters (3) at the UAM and the ICMN-CSIC (Madrid) with >800 calculation nodes.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications I select 10 representative articles for different areas for the last 7 years. See full list at: <https://scholar.google.com/citations?user=qk06ZlQAAAAJ&hl=es>

- 1.- *Cyclodehydrogenation of Molecular Nanographene Precursors Catalyzed by Atomic Hydrogen*. R. Zuzak, P. Dabczynski, J. Castro-Esteban, **J. I. Martínez**, M. Engelund, D. Pérez, D. Peña, Szymon Godlewski. *Nature Communications* 2025, 16, 691.
- 2.- *Implantation of Gallium into Layered WS₂ Nanostructures in Facilitated by Hydrogenation*. **J. I. Martínez**, A. Laikhtman, A. Zak, M. Sezen, J. A. Alonso. *Small* 2024, 20(30), 2312235.
- 3.- *Attomolar detection of hepatitis C virus core protein powered by molecular antenna-like effect in a graphene field-effect aptasensor*. I. Palacio, M. Moreno, A. Nández, A. Purwidyantri, T. Domingues, P. D. Cabral, J. Borme, M. Marciello, J. I. Mendieta-Moreno, B. Torres-Vázquez, **J. I. Martínez**, M. F. López, M. García-Hernández, L. Vázquez, P. Jelínek, P. Alpuim, C. Briones, J. A. Martín-Gago. *Biosensors and Bioelectronics* 2023, 222, 115006.
- 4.- *Concentration asymmetry and carbon enrichment in titanium carbide and silicon carbide clusters*. **J. I. Martínez**, J. A. Alonso. *Physical Review A* 2022, 105(6), 062820.
- 5.- *Structure, stability, and optical absorption spectra of small Ti_nC_x clusters: a first-principles approach*. S. Gámez-Valenzuela, J. A. Alonso, G. Santoro, **J. I. Martínez**. *Monthly Notices of the Royal Astronomical Society* 2021, 508(4), 5074-5091.
- 6.- *Role of the structure and reactivity of Cu and Ag surfaces in the formation of a 2D Metal-Hexahydroxytriphenylene network*. A. Rochefort, L. Vernisse, A. C. Gómez-Herrero, C. Sánchez-Sánchez, J. A. Martín-Gago, F. Chérioux, S. Clair, J. Coraux, **J. I. Martínez**. *The Journal of Physical Chemistry C* 2021, 125(31), 17333-17341.
- 7.- *A Trapezoidal Octacyanoquinoid Acceptor Forms Solution & Surface Products by Antiparallel Shape Fitting with Conformational Dipole Momentum Switch*. J. Casado, S. Medina, J. Urieta-Mora, A. Molina-Ontoria, C. Martín-Fuentes, J. I. Urgel, M. Zubiria-Ulacia, V. Lloveras, D. Casanova, **J. I. Martínez**, J. Veciana, D. Ecija, N. Martín. *Angewandte Chemie International Edition* 2021, 60(3), 17887-17892.
- 8.- *Metal-catalyst-free gas-phase synthesis of long-chain hydrocarbons*. L. Martínez, P. Merino, G. Santoro, **J. I. Martínez**, J. Ault, A. Mayoral, L. Vázquez, S. Katsanoulis, M. Accolla, A. Dazzi, J. Mathurin, F. Borondics, E. Blázquez-Blázquez, J. E. Quintanilla-López, R. Jelínek, N. Shauloff, R. Lebrón-Aguilar, J. Cernicharo, V. A. de la Peña O'Shea, H. A. Stone, P. L. de Andrés, G. Haller, G. J. Ellis, J. A. Martín-Gago. *Nature Communications* 2021, 12, 5937.
- 9.- *On-Surface Hydrogen-Induced Covalent Coupling of Polycyclic Aromatic Hydrocarbons via a Superhydrogenated Intermediate*. C. Sánchez-Sánchez, **J. I. Martínez**, N. Ruiz del Arbol, P. Ruffieux, R. Fasel, M. F. López, P. L. de Andres, J. A. Martín-Gago, *J. Amer. Chem. Soc.* 141, 3550-3557 (2019).
- 10.- *Highly Selective Covalent Organic Functionalization of Epitaxial Graphene*. R. Bueno, **J. I. Martínez**, R. Luccas, N. Ruiz del Árbol, C. Munuera, I. Palacio, F. J. Palomares, S. Thakur, J. M. Baranowski, W. Strupinski, M. F. López, F. Mompean, M. García-Hernández, J. A. Martín-Gago. *Nature Communications* 2017, 8, 15306.

C.2. Congresses. Results of my research have been communicated in >80 national/international symposiums (40 oral, and 12 invited and keynote contributions). Recent and more representative congresses/symposiums/workshops with Oral (OC) and Invited (IC) contributions:

- 1.- ICTF2023. Burgos (Spain). Sept. 26th-29th, 2023. "On-surface Design of a 2D Co-Organic Network preserving Large Orbital Magnetic Moment". OC
- 2.- 6th Graphene Flagship WP3 "Enabling Materials". Gran Canaria (Spain) Oct. 3rd-7th, 2022. "Hydrogen Interaction with Tungsten Disulfide Nanostructures". IC
- 3.- 5th Graphene Flagship WP3 "Enabling Materials" Online Meeting. Feb. 14th-18th, 2022. "Modelling of layered WS₂ nanostructures: Interaction with hydrogen". IC
- 4.- Riva2021 On-line. Oct. 4-6, 2021. "A Novel Trapezoidal Octacyanoquinoid Acceptor". OC
- 5.- CMD2020GEFES On-line. Aug. 31st-4th Sept. "Cathodoluminescence in Single- and Multi-wall WS₂ Nanotubes". OC

- 6.- Symposium on Progress in Organic Electronics and Energy Conversion. Malaga (Spain). Dec. 12th-13th, 2019. "Stout Fluorescence Enhancement of Fungicide Thiabendazole by vdW Interaction with TMDC Nanosheets for Highly-specific Sensors". IC
- 7.- IPOE2019. Cergy-Pontoise (France). July 8th-11th, 2019. "On-surface Bottom-up Synthesis of Azine Derivatives Displaying Strong Acceptor Behavior". OC
- 8.- OSS2018. Sant Feliu (Spain). Sept. 24th-28th, 2018. "Universal Trends in the Covalent Functionalization of Epitaxial Graphene by Amino-terminated Organic Molecules". OC

C.3. Research projects. Recent and more representative R&D+i projects, some as PI.

Regional/National Projects

- 1.- CAM Technologies R&D+i call: "Synthesis of Molecular Materials at Interfaces – SYNMOLMAT-CM" TEC-2024/TEC-459. From jan-2025 to dic-2028. Total: 952.000€ / group: 119.626,20€. Coord.: Nazario Martín León. **ICMM-MASLab subproject PI: José I. Martínez.**
- 2.- "Fundamentos de la interacción de contaminantes emergentes con materiales de baja dimensionalidad – NANOSENS4ENV". MICINN. **PI and Coord.: José I. Martínez** (ICMM) Period: 01/09/2024 – 31/08/2027. Ref.: PID2023-149077OB-C31). Funding: 262.500€.
- 3.- Strategic lines call: "Solar catalysis for a renewable energy Future"-SOLFUTURE PLEC2021-007906. From dic-2021 to dic-2024. Total: 1.148.591€ / group: 188.340€. Main PI: Victor de la Peña. ICMM-subproject: J. A. Martín-Gago. Member of the research team.
- 4.- National plan project ("Retos"): "Synthesis, characterization, and applications of nanomaterials: from Laboratory to Technology (nanoLabTech)" (PID2020-113142RB-C21. ICMM-UAM. 250 K€. PI and Coord.: C. Sánchez. Member of the research team.
- 5.-Research R&D network Comunidad de Madrid: "New generation of materials for artificial photosynthesis" (FotoArt-CM). S2018/NMT-4367 From Jan. 2018 to Dec. 2021. Total amount: 1080K€ (all consortium); Our group: 120k€. Main PI: Victor de la Peña. ICMM-subproject: José A. Martín-Gago. Member of the research team.
- 6.- "Materiales funcionales de baja dimensionalidad para (bio)sensores electroquímicos – FUNLDS". MICINN. **PI and C: José I. Martínez** (ICMM) Period: 01/01/2018 – 30/09/2021. Ref.: MAT2017-85089-C2-1-R). Funding: 181.500€.
- 7.- CVCSIC-AEPP-AYUDAS EXTRAORDINARIAS PREPARACION PROYECTOS 2020 (associated to MAT2017-85089-C2-1-R). Funding: 13.040€. 01-2021/08-2021. **PI.**
- 8.- PROGRAMA DE INCENTIVAC., DE INCORPORACION E INTENSIFICACION DE LA ACT. INVESTIGADORA. CSIC. "Desarrollo y caracterización in silico de materiales funcionales de baja dimensionalidad para aplicaciones optoelectrónicas y (bio)sensores electroquímicos" (Ref. 202060I007). Funding: 5.000€. 11/2020-12/2022. **PI.**

EU Projects

- 1.- "Gas and Dust: From the stars to the laboratory: Exploring the NANOCOSMOS". European "Ideas" ERC Synergy Grants. PIs: J. A. Martín-Gago, Ch. Joblin, J. Cernicharo. 2014-2021. Ref.: ERC-2013-SYG-610256. Funding: 15M€ (4M€ ICMM). Member of the research team.
- 2.- "Flagship Graphene: Future ICT, GrapheneCore1, GrapheneCore2, GrapheneCore3", WP3. "Materials" Coordinator at ICMM: M. García-Hernández. 2013-2016/2016-2018/2018-2020/2020-2023. Funding: 1.2M€/900k€/650k€/918k€. Member of the research team.

C.4. Contracts, technological or transfer merits.

Contracts - PI "Technological assistance contract" with the enterprise DYNASOL GESTION S.L., "TRABAJOS DE SIMULACIÓN DE INTERACCIÓN DE OLIGÓMEROS DE BUTADIENO FUNCIONALIZADO SOBRE UNA SUPERFICIE DE SILICE". Invoiced: 2000 € (2017)

- PI "Technological assistance contract" with the enterprise DYNASOL GESTION S.L., "TRABAJOS DE SIMULACIÓN DE OLIGÓMEROS DE BUTADIENIL-LITIO ACOMPLEJADOS POR DIFERENTES COMPUESTOS QUÍMICOS". Invoiced: 3000 € (2017)

Patents - R. Bueno, **J. I. Martínez**, R. Luccas, M. F. López, F. Mompeán, M. García-Hernández: "Procedimiento de obtención de un grafeno funcionalizado covalentemente con una molécula orgánica" (2016). National: P201630971 | European: EP17827054 (CSIC).