

CURRICULUM VITAE ABREVIADO (CVA)

Part A. PERSONAL INFORMATION

First name	Joaquin		
Family name	Ramirez Rico		
Gender (*)	Male	Birth date	
ID number			
e-mail		URL Web	
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-1184-0756		

A.1. Current position

Position	Full professor - Catedrático		
Initial date	2022		
Institution	University of Seville		
Department/Center	Condensed Matter Physics – School of Physics		
Country	Spain	Phone number	
Keywords	Physics, Materials Science, Advanced Ceramics, Functional Materials, Carbon, Batteries, Supercapacitors		

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

Period	Position/Institution/Country/Interruption cause
2022-today	Full Professor (Catedrático), University of Seville, Spain
2018-2022	Associate Professor (Titular), University of Seville, Spain
2012-2018	Assistant Professor (Contratado Doctor), University of Seville, Spain
2010-2012	Lecturer (Ayudante Doctor), University of Seville, Spain
2009-2010	Postdoctoral Researcher, Northwestern University, USA
2004-2008	Graduate student and Ph.D. candidate, University of Seville, Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Bachelor in physics	University of Sevilla – Spain	2003
Master in Materials Science	University of Sevilla – Spain	2007
PhD in Materials Science	University of Sevilla – Spain	2008

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

I am a full Professor in the Department of Condensed Matter Physics at the University of Sevilla and associated with the Materials Science Institute of Sevilla (ICMS), a joint University of Sevilla-CSIC research institute. My starting area of research was on the characterization and mechanical properties of ceramic materials for thermo-structural applications and obtained my PhD in 2008 working on melt-grown eutectic ceramics. During my PhD I did two research internships at Argonne National Lab, under the supervision of Dr J. L. Routbort, performing neutron scattering measurements at the Intense Pulsed Neutron Source. In a two-year postdoctoral stage I worked with Prof. K. T. Faber at Northwestern University on the determination of stresses in plasma-sprayed ceramic multilayers and the in-situ study of fracture processes in SiC/SiC composites using synchrotron radiation, at beamline 1ID of the Advanced Photon Source.

Within the field of ceramic materials my main lines of research have been the study of complex eutectic oxides, high-temperature proton conductors for SOFC/electrolyser applications, ZrB₂-based ultra-high temperature ceramics, SiC composites and porous ceramics. In the field of porous materials, I have worked on wood-derived porous SiC materials for applications such as catalyst supports, high-temperature filtration or long-bone prostheses in regenerative medicine. My line of research into ceramic materials has resulted in the supervision of two PhD thesis and two grants funded by the Agencia Estatal de Investigación as Co-PI.

Since 2012 I have researched the use of biomass-derived carbon materials for energy and environmental applications. I studied mechanisms to graphitize amorphous carbon and to functionalize porous carbon monoliths with different oxide nanostructures, for applications in supercapacitors, batteries and electrodes in capacitive desalination systems. Under this topic I have supervised two additional PhD theses and I been sole PI in two research projects funded by the Junta de Andalucía (PAIDI 2021 program and FEDER-US program). Our research in the use of graphitized biomass for lithium-ion and sodium-ion battery anodes has resulted in publications in some of the leading journals in the field, and on-going collaborations with the Münster Electrochemical Energy Technology Institute (Prof. Winter) and the University of Birmingham (Prof. Schnepf). Since 2019 I lead the Biomimetic and Multifunctional Materials Research Group (FQM342) at the University of Seville.

In the realm of technology transfer, teaching and research management, have been PI for an industrial contract with ALFRAN within the framework of the INTERCONNECTA call (CDTI) and have published two patents on applications of porous materials. Since 2016 I am the Scientific Director of the General Research Service 'X-ray Laboratory' of the University of Seville, leading a team of 5 permanent technicians supporting X-ray instrumentation, being PI of several EQC projects of the AEI. During my career I have secured over 4,1M€ in funding as PI (combining research and infrastructure projects). I also served as coordinator for the Materials Science MSc program for a three-year period (2013-2016).

I have three recognized 6-year research periods (sexenios): 2004-2009, 2010-2015 y 2016-2021, supervised four PhD theses in the last 10 years, 2415 total citations and 1479 citations in the 2020-2024 period (296 citations/year), h-Index = 29 (source: Google Scholar) / 1991 total citations and 1244 citations in the 2020-2024 period (249 citations/year), h-Index = 26 (source: Scopus). I am the author or co-author of 90 indexed papers (Scopus).

Part C. RELEVANT MERITS

C.1. Publications

1. Scientific paper. Hunter, Robert D.; Takeguchi, Masaki; Hashimoto, Ayako; et al; Schnepf, Zoe; (10/11) **Ramírez-Rico, Joaquín (AC)**. 2024. Elucidating the Mechanism of Iron-Catalyzed Graphitization: The First Observation of Homogeneous Solid-State Catalysis. *Advanced Materials* 36, 2404170.
2. Scientific paper. Fernández-Muñoz, Sol; Alba, María D.; Chacartegui, Ricardo; (4/4) **Ramírez-Rico, Joaquín (AC)**. 2024. Optimising anode supported $\text{BaZr}_{1-x}\text{Y}_x\text{O}_{3-\delta}$ electrolytes for solid oxide fuel cells: Microstructure, phase evolution and residual stresses analysis. *Journal of Power Sources*. 596, pp. 234070.
3. Scientific paper. Gómez-Martín, Aurora; Schnepf, Zoe; (3/3) **Ramírez-Rico, Joaquín (AC)**. 2021. Structural evolution in iron-catalyzed graphitization of hard carbons. *Chemistry of Materials*. 33-9, pp.3087-3097.
4. Scientific paper. Gomez-Martin, A.; Martinez-Fernandez, J.; Rutttert, Mirco; Winter, Martin; Placke, Tobias; (6/6) **Ramírez-Rico, J.** 2020. An electrochemical evaluation of nitrogen-doped carbons as anodes for lithium ion batteries. *Carbon* 164, pp.261-271.
5. Scientific paper. Gomez-Martin, Aurora; Martinez-Fernandez, Julian; Rutttert, Mirco; Winter, Martin; Placke, Tobias; (6/6) **Ramírez-Rico, Joaquín (AC)**. 2019. Correlation of Structure and Performance of Hard Carbons as Anodes for Sodium Ion Batteries. *Chemistry of Materials*. 31-18,
6. Scientific paper. Gomez-Martin, Aurora; Martinez-Fernandez, Julian; Rutttert, Mirco; Heckmann, Andreas; Winter, Martin; Placke, Tobias; (7/7) **Ramírez-Rico, Joaquín (AC)**. 2018. Iron-Catalyzed Graphitic Carbon Materials from Biomass Resources as Anodes for Lithium-Ion Batteries. *ChemSusChem* 11-16, pp.2776-2787.
7. Scientific paper. Gómez-Martín, A.; Orihuela, M. P.; Becerra, J. A.; Martínez-Fernández, J.; (5/5) **Ramírez-Rico, J. (AC)**. 2016. Permeability and mechanical integrity of porous biomorphic SiC ceramics for application as hot-gas filters. *Materials & Design* 107, pp.450-460.

8. Scientific paper. Gutierrez-Pardo, Antonio; Lacroix, Bertrand; Martinez-Fernandez, Julian; (4/4) **Ramirez-Rico, Joaquin**. 2016. Manganese dioxide supported on porous biomorphic carbons as hybrid materials for energy storage devices. ACS Applied Materials & Interfaces. 8-45, pp.30890-30898.
9. Scientific paper. Gutiérrez-Pardo, A.; (2/4) **Ramírez-Rico, J. (AC)**; Cabezas-Rodríguez, R.; Martínez-Fernández, J. 2015. Effect of catalytic graphitization on the electrochemical behavior of wood derived carbons for use in supercapacitors. Journal of Power Sources 278-15, pp.18-26.
10. Review paper. Hunter, R. D.; (2/3) **Ramírez-Rico, J.**; Schnepf, Z. 2022. Iron-catalyzed graphitization for the synthesis of nanostructured graphitic carbons. Journal of Materials Chemistry A 10-9, pp.4489-4516.

C.2. Conferences

1. Invited talk: **J. Ramirez-Rico**, Z. Schnepf, A. Gómez-Martín. Biomass-derived carbon materials: understanding the correlation between atomic structure and electrochemical properties using in-situ techniques, in Brazilian-MRS Meeting, Sep 29-Oct 3, Santos, Brazil.
2. Invited talk: **J. Ramirez-Rico**. Biomass and wood derived materials for structural and energy applications, in ACerS Panamerican Ceramic Congress, Jul 24-28 2022. Panama City, Panama.
3. Invited talk: **J. Ramirez-Rico**, J. Martinez-Fernandez, M. P. Orihuela, A. Gomez-Martin, R. Chacartegui, J. A. Becerra, P. Miceli, and D. Fino. Ceria-based catalytic regeneration of wall-flow Diesel Particulate Filters made of biomorphic Silicon Carbide, in 42nd International Conference and Expo on Advanced Ceramics and Composites. 2018. Daytona Beach, FL, EEUU: The American Ceramic Society.
4. Invited talk: **J. Martinez-Fernandez**, J. Ramirez-Rico, F. M. Varela-Feria, C. Vera-García, A. Gutierrez-Pardo, Bio-inspired Ceramic Composites for Engineering Applications, 36th International Conference & Exposition on Advanced Ceramics & Composites, Daytona Beach, FL, USA. American Ceramic Society 2012.
5. Invited talk: **J. Ramirez-Rico**, J. M. Fernandez, M. Singh, Environmentally Conscious SiC Ceramics Obtained from Natural Precursors: Recent Developments and Challenges, 3rd International Congress on Ceramics, Osaka, Japan, 2010.

C.3. Research projects

1. Project: “Biomorphic materials for energy storage (BioMatStor)”, 2021-23, Consejería de Economía, Conocimiento, Empresas y Universidad, Junta de Andalucía, PAIDI: Proyectos I+D+i. P20/01186, 106.550,00 €. IP: **Joaquín Ramírez Rico**
2. Project: “Biomass for DEsalination via CAPacitive Deionization and Energy Storage, (BioDECADES)” 2022, Consejería de Economía, Conocimiento, Empresas y Universidad, Junta de Andalucía. Programa FEDER Andalucía 2014-2020 US-1380856, 80.000,00 €. IP: **Joaquín Ramírez Rico**.
3. Project: “Cerámicas Conductoras de Protones para Electrolizadores Reversibles de Alta Eficiencia y Aplicaciones Power to X”, 2020-23, Ministerio de Ciencia, Innovación y Universidades, PID2019-107019RB-I00, 72.600,00€. IP1: **Joaquín Ramírez Rico**, IP2: Ricardo Chacartegui Ramírez.
4. Project: “Nuevo concepto de caldera de biomasa basada en materiales biocerámicos y combustión porosa para operación eficiente con residuos”, 2017-2019. Ministerio de Economía y Competitividad, MAT2016-76526-R, 60.500,00 €. IP1: **Joaquín Ramírez Rico**, IP2: Ricardo Chacartegui Ramírez.
5. Project: “SOLar Calcium-looping integRation for Thermo-Chemical Energy Storage (SOCRATCES)”, 2018-2020, Research and Innovation Action H2020, Comisión Europea, PRJ201703228. 401,250.00 € (parte correspondiente a la Universidad de Sevilla). IP: Ricardo Chacartegui Ramírez.

6. Project: “Filtros bio-ceramicos para particulas en motores diésel”. 2014-2016. Ministerio de Economía y Competitividad, MAT2013-41233-R, 197.551,02 €. IP1: Julián Martínez Fernández, IP2: Ricardo Chacartegui Ramírez.
7. Project: “BIOENER: Aplicación de tecnologías biomiméticas en sistemas energéticos”. 2010-2013. Consejería de Innovación, Ciencia y Empresa de la Junta de Andalucía, proyecto motriz (311.167,68€) P09-TEP-5152. IP: Julián Martínez Fernández
8. Project: “Aplicación de una nueva generación de materiales cerámicos bioderivados a procesos industriales de filtración a altas temperatura y presión” (BIOFIL). 2008-2009. MCI, CIT-120000-2008-16 241.530 € (125.720 € correspondientes a la Univ. De Sevilla). IP: Julián Martínez Fernández
9. Project: “FILGAS: Mejora Tecnológica de la Filtración de Gas de Síntesis en Procesos de Gasificación a Alta Temperatura y Presión”. 2007.2008. Ministerio de Medioambiente, Proyectos Medioambientales de Investigación Científica A516/2007/3 (124.530 €). IP: Julián Martínez Fernández
10. “New Bio-ceramization processes applied to vegetable hierarchical structures”. 2006-2010. Specific Targeted Research Projects STRP 033277 TEM-PLANT (VII Programa Marco UE). 314.000 €. IP: Julián Martínez Fernández (Univ. de Sevilla).

C.4. Contracts, technological or transfer merits

1. Infrastructure project: “Haz de luz para laboratorio SAXS/WAXS para medidas in-situ/in-operando en la nanoescala”, 2024, Ministerio de Ciencia, Innovación y Universidades, EQC2024- 007934-P, 1.012.590€. IP: **Joaquín Ramírez Rico**
2. Infrastructure project: “Instrumento de tomografía axial computarizada de altas prestaciones con tubo de alta energía”, 2024, Ministerio de Ciencia, Innovación y Universidades, EQC2024- 008566-P, 1.019.546€. IP: **Joaquín Ramírez Rico**
3. Infrastructure project: “Instrumento versátil de nanotomografía axial computarizada”, 2018-2019. Ministerio de Ciencia, Innovación y Universidades, EQC2018-004027-P, 800.000,00€. IP: **Joaquín Ramírez Rico**
4. Infrastructure project: “Actualización y mejora de las capacidades en difracción y fluorescencia de rayos X de los Servicios Generales de Investigación”, 2019-20. Ministerio de Ciencia, Innovación y Universidades, EQC2019-005577-P. 420.659,00€ IP: **Joaquín Ramírez Rico**
5. Infrastructure project: “Equipo portátil de fluorescencia de rayos x con capacidad de mapeo de área”, 2019-20. Ministerio de Ciencia, Innovación y Universidades, EQC2019-005579-P. 135.700,00 € IP: **Joaquín Ramírez Rico**
6. Research contract: “Materiales Vítreos Cementantes de Alta Eficiencia Energética y Bajo Impacto Ambiental (MAVIT)”. 2012-2015. Contract with Alfran Refractarios, S. L. 120.000 €. IP: **J. Ramirez-Rico**.
7. Patent: A. Tampieri, S. Sprio, A. Ruffini, J. Will, P. Greil, F. Mueller, J. Martínez-Fernández, C. Torres-Raya, F. M. Varela-Feria, **J. Ramírez-Rico** & M. F. Harmand. “Implants for 'load bearing' bone substitutions having hierarchical organized architecture deriving from transformation of vegetal structures”. MI2010A002070, Italy, 2010
8. Patent: J. Martínez-Fernández, R. Chacartegui, **J. Ramírez-Rico**, J. A. Becerra-Villanueva, M. P. Orihuela, A. Gómez-Martín. “Filtro para partículas de motores Diesel utilizando carburo de silicio biomórfico”. ES2759498A1, Spain, 2020.