

**Part A. PERSONAL INFORMATION**

**CV Date**

07/06/2023

First and Family name	María del Carmen García Martínez	
Social Security, Passport, ID number		
Researcher codes	WoS Researcher ID	K-3984-2014
	Open Researcher and Contributor ID (ORCID) **	<a href="http://orcid.org/0000-0002-9666-4041">http://orcid.org/0000-0002-9666-4041</a>

**A.1. Current position**

Name of University/Institution	Universidad de Córdoba (University of Cordoba)		
Department	Department of Applied Physics, Escuela Politécnica Superior		
Address and Country	C-2 Building; 1 <sup>st</sup> Floor, Campus de Rabanales, Cordoba (Spain)		
Phone number	+34 957212633	e-mail	<a href="mailto:fa1gamam@uco.es">fa1gamam@uco.es</a>
Current position	Full Professor	From	20/08/2019
Key words	Plasma Physics, plasma diagnosis, plasma applications, plasma-liquid interactions, plasma-medicine, plasma catalysis		

**A.2. Education**

Degree	University	Year
MS Physics	Universidad de Sevilla (Spain)	1992
PhD Physics	Universidad de Córdoba (Spain)	1999

**A.3. General indicators of quality of scientific production (Web of Science)**

Six-year reasearch periods	4	Dates: 01/01/2004; 01/01/2007; 01/01/2013; 01/01/2019
PhD advisory	2	
Web of Science Publications:	43	
Total times cited:	897	
Average citations per year (last five years):	84,6	
Publications in Q1:	27 (7 D1)	
h-index:	17	

**Part B. CV Summary**

María C. García received her MS degree in Physics from the University of Sevilla (Spain) in 1992 and her Ph.D. degree in Physics from the University of Córdoba (UCO) in 1999. From 1998 to 2003 she served as Assistant Professor with the Applied Physics department at the University of Córdoba, where she also worked as Associate Professor from 2003 to 2019. She is currently a Full Professor of this department.

María C. García is currently the leader of the Research Group “*Física de Plasmas: Diagnosis, Modelos y Aplicaciones*” FQM 136 and is responsible for the “*Plasma Technology and Solar Energy Laboratory*” at the Applied Physics Department (UCO). She is a member of the *Michigan Institute for Plasma Physics and Engineering* (University of Michigan, USA) since 2014. Her areas of research interest include plasma physics, plasma diagnosis, plasma applications, plasma-liquid interactions, plasma-medicine, and plasma catalysis.

She has collaborations with different national and international groups, including the “*Plasma Science and Technology Laboratory*” (University of Michigan), “*Catálisis Orgánica y Materiales Nanoestructurados*” (UCO), and the group headed by G. Brelles from the “*Center for Research and Development on Industrial Fermentations*” (CONICET, Argentina). She also had collaborations with

the group “*Enfermedades Inflamatorias Cutáneas Inmunomediadas*” of the IMIBIC (Córdoba, Spain), and the Research Professor M. S Dimitrijevic from the Belgrade Astronomical Observatory (Serbia).

María C. García has obtained four six-year research periods from the national committee for the assessment of the research action (CNEAI) and five five-year teaching periods.

She has published: 43 JCR articles, 4 articles in non-indexed journals, 1 patent, 2 books, 4 book chapters, and more than 85 conference contributions. She has participated/collaborated in 14 Research Projects, four of which have been headed by colleagues from the University of Michigan.

Since 2012 she has undertaken FIVE short research stays as a *Visiting Scholar* at the University of Michigan (fifteen months in total).

She has supervised 2 Ph.D. thesis, 2 M.S. thesis, 19 B.S. thesis, and she is currently supervising 1 Ph.D. thesis and 1 B.S. thesis.

She is currently co-Director of the inter-university Master “*Plasma, Láser y Tecnologías de Superficie*” (UPM, UCO, ICM-ICMM-CSIC, ICMSE-CSIC). In the scholar year 2020-21 she was a member of the PEvAU panel on Physics in Andalucía.

Since 1995 she has lectured more than 4000 hours corresponding to different subjects in the field of Applied Physics. She belongs to the Teaching Innovative Group “*Aplicación de las Nuevas Tecnologías y Métodos de Enseñanza en la docencia de la Física en Ingeniería*” since 2007, which headed from 2007 to 2013. In April 2018, she was awarded the Mention of Excellence in Teaching in the UCO Docencia Program.

María C. García is a member of the *Real Sociedad Española de Física* and takes part of the governing team of its specialized group *Física de Plasmas*. She is also a member of the *European Physical Society*.

## Part C. RELEVANT MERITS (from 2013)

### C.1. Publications (10 most relevant)

1. Mateo J, **García MC** and Rodero A, *Using laser-induced breakdown spectroscopy for the study of chloride diffusion in mortar and concrete*, Construct. Build. Mater. **385** (2023) 131520
2. **García MC** and Foster JE, *Promise of nonthermal plasmas in addressing emerging environmental and health problems: Present and future*, Physics of Plasmas, **29** (2022) 060601
3. **García MC**, Yubero C, Rodero A, *Gas temperature and air fraction diagnosis of helium cold atmospheric plasmas by means of atomic emission lines*, Spectrochim. Acta B: Atomic Spectroscopy, **193** (2022) 106437
4. Kovach Y, **García MC**, Foster JE, *The variation in self-organised anode plasma pattern structure with solution electrolyte type in 1 atm DC glow discharge*, Plasma Sources Sci. Technol. **30** (2021) 015007
5. **García MC**, Yubero C, Rodero A, *Measuring the air fraction and the gas temperature in non-thermal argon plasma jets through the study of the air influence on the collisional broadening of some argon atomic emission lines*, Plasma Sources Sci. Technol., **29** (2020) 055006
6. Foster JE, Lai J, Kovach Y, **García MC**, *Self-organization in 1 atm DC glows with liquid anodes: current understanding and potential applications*, Plasma Sources Sci. Technol., **29** (2020) 034004
7. Mateo J, Quintero MC, Fernández JM, **García MC**, Rodero A, *Application of LIBS technology for determination of Cl concentrations in mortar samples*, Construct. Build. Mater. **204** (2019) 716-726
8. **García MC**, Mora M, Esquivel D, Foster JE, Rodero A, Jiménez C, Romero FJ, *Microwave atmospheric pressure plasma jets for wastewater treatment: Degradation of methylene blue as a model dye*, Chemosphere **180** (2017) 239-246
9. Gay-Mimbrera J, **García MC**, Isla-Tejera B, Rodero A, Ruano J, *Clinical and Biological Principles of Cold Atmospheric Plasma Application in Skin Cancer*, Adv. Therapy **33** (2016) 894-909
10. Gucker SN, Foster JE, **García MC** *An investigation of an underwater steam plasma discharge as alternative to air plasmas for water purification*, Plasma Sources Sci. Technol. **24** (2015) 055005 (14pp)
10. **García MC**, Gucker SN, Foster JE, *Understanding the plasma and power characteristics of a self-generated steam bubble discharge*, J. Phys. D-Applied Physics **48** (2015) 355203 (10pp)

## **C.2. Research Projects and Grants**

- *Reformado con CO<sub>2</sub> y Plasmacatálisis para la Obtención de Hidrógeno, Combustibles Líquidos y Nanotubos de Carbón* (J. Andalucía, P10-FQM-6181) 06/07/2011-30/04/2016 (147307 €) Researcher
- *An Investigation of Plasma Formation in Electromechanically driven Free Bubbles at Resonance in Water with Applications for the Treatment of Contaminated Water* (National Science Foundation NSF 1033141) 01/09/2010-31/08/2013 (\$296445) Collaborator
- *Tratamiento de atmósferas y aguas con tecnología de plasma. Aplicaciones a las industrias agropecuarias* (Plan Propio UCO) (25/06/2015-30/06/2016) (3000 €) Principal Investigator
- *An Investigation of Plasma Formation in Electromechanically driven Free Bubbles at Resonance in Water with Applications for the Treatment of Contaminated Water* (National Science Foundation NSF 1336375) 01/09/2013-31/08/2016 (\$250000) Collaborator
- *Nanostructured multi-layered architectures for the development of optofluidic responsive devices, smart labels and advanced surface functionalization* (MINECO, MAT2016-79866-R) 2017-2020 (275000€) Researcher
- *Understanding the Mechanisms of Self-Organization in Atmospheric Pressure DC Glows* (Department of Energy, Office of Science, DE-SC0018058) 01/07/2017-30/06/2020 (\$275000) Collaborator
- *Micro-Plasmas Through Porous Media* (Department of Energy, Office of Science, NSF 1519117) 01/09/2015-31/08/2018 (\$405000) Collaborator
- *Nucleation and Growth Mechanisms on Piezoelectric Surfaces under Acoustic Excitation in Plasma/Vacuum Environments (MONET)* (Ministerio de Ciencia e Innovación, PID2020-112620GB-I00), 01/09/2021-31/08/2024 (88.000,00 + 18.480,00 €) Researcher
- *Atmospheric Pressure Gliding Arc Discharges for Sustainable Applications [FIREBOW]* (Ministerio de Ciencia e Innovación, PID2020-114270RA-I00) 01/09/2021-31/08/2024 Researcher
- *Development of intermittent plasmas ignited by renewable electricity for the CO<sub>2</sub> splitting and revalorization processes [RENOVACO<sub>2</sub>]* TED2021-130124A-I00, (148.925,00 €) Researcher
- *Understanding the Role of Thermally-Driven Processes in Pattern Formation and Droplet Emission in DC Glows with Applications to Water Treatment* (National Science Foundation NSF-2206039) Collaborator

## **C.3. Patents**

- C. Yubero, M.D. Calzada, M.C. García “Procedimiento de calibración absoluta en intensidad de un dispositivo óptico” ES 2 323 206 B1 **REQ. NUMBER:** P200602607 **PRIOR. DATE:** 07-04-2010 (UCO)

## **C.4. Short term stays in foreign institutions**

- Michigan Institute for Plasma Physics and Engineering (Univ. of Michigan) Ann Arbor (Michigan) (USA) **Date:** 01/02/2012 **Extent (weeks):** 26; **Subject:** Plasma Assisted Technologies for Advanced Industrial Applications (Visiting Scholar) (<http://mipse.umich.edu/visitors/index.htm>) (**Junta Andalucía Grant:** 7804 €)
- Michigan Institute for Plasma Physics and Engineering (Univ. of Michigan) Ann Arbor (Michigan) (USA) **Date:** 01/07/2014 **Extent (weeks):**13; **Subject:** OES Study of Plasma Bubbles with Applications to Water Treatment (Visiting Scholar) (**Ministerio de Educación Grant:** 9668,06 €)
- Michigan Institute for Plasma Physics and Engineering (Univ. of Michigan) Ann Arbor (Michigan) (USA) **Date:** 01/07/2016 **Extent (weeks):**13; **Subject:** Diagnosis of Plasmas in Contact with Liquids with Applications to Water Treatment (Visiting Scholar) (**UCO Grant:** 1867 €)
- Michigan Institute for Plasma Physics and Engineering (Univ. of Michigan) Ann Arbor (Michigan) (USA) **Date:** 01/07/2018 **Extent (weeks):** 9; **Subject:** Diagnosis of Plasmas in Contact with Liquids with Applications to Water Treatment and Biofilms (Visiting Scholar) (**UCO Grant:** 1490 €)
- Michigan Institute for Plasma Physics and Engineering (Univ. of Michigan) Ann Arbor (Michigan) (USA) **Date:** 01/11/2022 **Extent (weeks):** 5; **Subject:** Diagnosis of Plasmas in Contact with Liquids with Applications to Water Treatment and Biofilms (Visiting Scholar)

## **C.5. Organization of research activities**

- Member of the Local Organizing Committee of *VII Congreso Ibérico de Espectroscopía* (September 2012)
- Secretary of the Local Organizing Committee of *IX International Workshop on Microwave Discharges: Fundamentals and Applications* (September 2015)

- Member of the International Scientific Committee of the International Conference on Green Construction ICGC2019 (April 2019)

#### **C.6. Conference contributions**

27 contributions in the last ten years.

#### **C.7. Graduate Student, Post-Doctoral and Scientist Supervision (last ten years)**

- 6 BS Theses, 2 MS Theses, 1 PhD These (in progress)
  - *Activación de medios acuosos mediante plasma*, (BS These), UCO Fac. Ciencias, 2019
  - *Desarrollo y caracterización de un reactor de plasma para el tratamiento de materiales y superficie* (BS These), UCO, EPSC, 2019
  - *Diagnosis Espectroscópica de Plasmas Fríos Atmosféricos de Utilidad Biomédica* (BS These), UCO, Fac. Ciencias, 2018
  - *Activación de medios acuosos mediante plasma* (BS These), UCO, Fac. Ciencias, 2017
  - *Tratamiento de aguas mediante descargas de microondas* (MS These), Máster Interuniversitario UCO UPM, 2016
  - *Plasma de vapor de Agua* (MS These) Máster Interuniversitario UCO UPM, 2016
  - *Análisis de la reproducción cromática de rgb leds para su uso en el mundo de la señalización de carreteras* (BS These) UCO, Fac. Ciencias, 2015
  - *Aplicación web para la representación vectorial en 3D* (BS These), UCO, EPSC, 2013
  - *Aplicación de la técnica LIBS para el estudio de la degradación de morteros y hormigones*, PhD These (in progress)
- Responsible for internal students of the Dep. of Applied Physics at the University of Córdoba: *José María Serrano Barranco* (curso 2012/13), *Pascual Espinar Cortecero* (curso 2014/15), *José Carlos Parra Silva* (curso 2014/15), *Encarnación Arroyo Porriño* (cursos 2016/17 y 2017/18), *José Antonio Romero Rosales* (curso 2018/19).
- Responsible for the stay at the Dep. of Applied Physics at the University of Córdoba of the student *Juliana Soler Arango* (Univ. Nacional de la Plata, Argentina) (Beca Movilidad AUIP) (01/09/2017-31/10/2017)

#### **C.8. Evaluation activities**

- Member of the **Doctoral Committee** of the following **PhD defenses**: *Paula Nvascués* (Univ, Sevilla, 01/06/2022), *Inés Hamouda* (Univeritat Politèctica de Catalunya, 16/12/2020), *Yao Kovack* (University of Michigan, 11/11/2020), *Antonio Méndez Montoro* (Universidad de Sevilla, 09/03/2018), *Álvaro Martínez Valle* (Universidad de Córdoba, 30/09/2013).
- Member of the **Doctoral Committee of the PhD Prospectus** of *Yao Kovack* (University of Michigan, 22/02/2019).
- **Peer review activities** in *Plasma Sources Sci. Technol.*, *J. Phys. D*, *Spectrochim. Acta B*, *IEEE Trans. Plasma Sci.*, *Australasian Physical and Engineering Sciences in Medicine*.

#### **C.9. Professional Memberships**

- Member of the *Michigan Institute for Plasma Physics and Engineering* (University of Michigan, USA) since September 2014-today (<https://mipse.umich.edu/members.php#garcia>)
- COST action TD1208 (*Electrical discharge plasmas in contacts with liquids*) (2014-2017)
- COST action CA20114 (2021-)
- Member of the *Real Sociedad Española de Física* since 2010-today
- Member of the *European Physical Society* since 2008-today

#### **C.10. Institutional responsibilities**

University of Córdoba:

- Responsible for PEVAU Physics Panel at the University of Córdoba (Scholar year 2020-21)
- Member of the Senate of the University of Córdoba from 09/04/2014-december 2020
- Member of the Governing Board of the University of Córdoba since 17/10/2018-today
- Member of the Committee on Economic Affairs of the University of Córdoba since 21/12/2018-today

Higher Polytechnic School of Córdoba

- Member of the Faculty Board (19/12/2014-13/12/2018)
- Member of the Committee on Study Programs of Mechanical Eng. Degree (17/03/2015-13/12/2018)
- Member of the Committee on Internal Regulations (17/03/2015-13/12/2018)

### **C.11. Awards and Honors**

- Roche-IMIBIC Prize 2016
- Mention in Teaching Excellence from the UCO (evaluated period 2013-17)-April 2018