

Fecha del CVA	29/08/2024
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Parte A. DATOS PERSONALES

Nombre	AMADOR MIGUEL		
Apellidos	GONZALEZ CRESPO		
Sexo		Fecha de Nacimiento	
DNI/NIE/Pasaporte			
URL Web			
Dirección Email	amador.m.gonzalez@upm.es		
Open Researcher and Contributor ID (ORCID)	0000-0003-1845-7300		

A.1. Situación profesional

Periodo	Puesto / Institución / País
2017 - actualidad	Director ETSI / Universidad Politécnica de Madrid / España
2013 - 2017	Subdirector / Universidad Politécnica de Madrid / España
2010 - 2013	Secretario/a ETSI / Universidad Politécnica de Madrid / España
2008 - actualidad	Titular Universidad / Universidad Politécnica de Madrid / España
1992 - 2008	Profesor Titular Escuela Univ. / Universidad Politécnica de Madrid / España
1990 - 1992	Profesor Interino Titular E.U. / Universidad Politécnica de Madrid / España
1990 - 1990	Profesor Interino Titular E.U. / Universidad Politécnica de Madrid / España
1986 - 1986	Funcionario de carrera / Agencia Estatal de Meteorología (AEMET)

A.2. Formación académica

Grado/Master/Tesis	Universidad / País	Año
Doctor en Ciencias Físicas	Universidad Autónoma de Madrid / España	1995
Licenciado en Ciencias (Físicas)	Universidad Autónoma de Madrid / España	1987

Parte B. RESUMEN DEL CV

Parte C. LISTADO DE APORTACIONES MÁS RELEVANTES (últimos 10 años)

C.1. Publicaciones más importantes en libros y revistas con “peer review” y conferencias

AC: Autor de correspondencia; (nº x / nº y): posición firma solicitante / total autores. Si aplica, indique el número de citaciones

- Artículo científico.** Manuel Vázquez-Rodríguez, Francisco J. Jiménez, Lorena Pardo, Pilar Oc...[et al.]. (5/). 2022. A New Prospect in Road Traffic Energy Harvesting Using Lead-Free Piezoceramics. Smart Materials And Devices For Energy Harvesting. MDPI. pp.79-94. ISBN 9783036531229.
- Artículo científico.** Jimenez, F.J; Jiménez F.J.; González AM...[et al.]. (2/6). 2021. A virtual instrument for measuring the piezoelectric coefficients of a thin disc in radial resonant mode. Sensors. MDPI AG. 21(12), pp.4107. ISSN 1424-8220. <https://doi.org/10.3390/s21124107>
- Artículo científico.** Ochoa-Perez P; Gonzalez-Crespo AM; Garcia-Lucas A...[et al.]. (2/ 6). 2021. FEA Study of Shear Mode Decoupling in Nonstandard Thin Plates of a Lead-Free Piezoelectric Ceramic. IEEE Transactions On Ultrasonics Ferroelectrics And Frequency Control. Institute of Electrical and Electronics Engineers Inc.. 68(2), pp.325-333. ISSN 0885-3010. SCOPUS (4) <https://doi.org/10.1109/TUFFC.2020.2996083>
- Artículo científico.** Pardo L; Reyes-Montero A; Garcia A...[et al.]. (6/9). 2020. A modified

- iterative automatic method for characterization at shear resonance: Case study of Ba_{0.85}Ca_{0.15}Ti_{0.90}Zr_{0.10}O₃ eco-piezoceramics. *Materials*. MDPI. 13(7), pp.E1666. ISSN 1996-1944. <https://doi.org/10.3390/ma13071666>
- 5 **Artículo científico.** VAZQUEZ RODRIGUEZ, MANUEL; JIMENEZ MARTINEZ, FRANCISCO JAVIER; Pardo, L...[et al.]. (5/6). 2019. A New Prospect in Road Traffic Energy Harvesting Using Lead-Free Piezoceramics. *Materials*. MDPI. 12(22), pp.E3725. ISSN 1996-1944. <https://doi.org/10.3390/ma12223725>
 - 6 **Artículo científico.** Reyes-Montero A; Pardo L; Garcia A...[et al.]. (4/5). 2019. Ba_{1-x}CaxTi_{0.90}Zr_{0.10}O₃ shear properties and their frequency dependence determined from ceramic plates by an effective method for resonance decoupling. *Journal Of Alloys And Compounds*. Elsevier BV. 806, pp.428-438. ISSN 0925-8388. SCOPUS (4) <https://doi.org/10.1016/j.jallcom.2019.07.210>
 - 7 **Artículo científico.** Vivar-Ocampo, Rodrigo; Pardo, Lorena; Avila, David...[et al.]. (5/7). 2017. Piezoelectric Ceramics of the (1-x)Bi_{0.50}Na_{0.50}TiO₃-xBa_{0.90}Ca_{0.10}TiO₃ Lead-Free Solid Solution: Chemical Shift of the Morphotropic Phase Boundary, a Case Study for x=0.06. *Materials*. MDPI. 10(7), pp.E736. ISSN 1996-1944. SCOPUS (7) <https://doi.org/10.3390/ma10070736>
 - 8 **Artículo científico.** Reyes-Montero, Armando; Ramos-Alvarez, Paola; Gonzalez, Amador M...[et al.]. (3/5). 2017. Dielectric and Impedance Analysis on the Electrical Response of Lead-Free Ba_{1-x}CaxTi_{0.9}Zr_{0.1}O₃ Ceramics at High Temperature Range. *Applied Sciences-Basel*. MDPI AG, Basel, Switzerland (open access). 7(3). ISSN 2076-3417. SCOPUS (13) <https://doi.org/10.3390/app7030214>
 - 9 **Artículo científico.** Gonzalez, Amador M.; Garcia, Alvaro; Benavente-Peces, Cesar...[et al.] (AC). (1/4). 2016. Revisiting the Characterization of the Losses in Piezoelectric Materials from Impedance Spectroscopy at Resonance. *Materials*. MDPI. 9(2), pp.E72. ISSN 1996-1944. SCOPUS (35) <https://doi.org/10.3390/ma9020072>
 - 10 **Artículo científico.** González, A. M.; Pardo, L.; Montero-Cabrera, M. E...[et al.]. (1/4). 2016. Analysis of the rhombohedral-tetragonal symmetries coexistence in lead-free 0.94(Bi_{0.5}Na_{0.5})TiO₃-0.06BaTiO₃ ceramics from nanopowders. *Advances In Applied Ceramics*. Taylor & Francis LTD. 115(2), pp.96-105. ISSN 1743-6753. SCOPUS (9) <https://doi.org/10.1080/17436753.2015.1131906>
 - 11 **Artículo científico.** Reyes-Montero, A.; Pardo, L.; Lopez-Juarez, R...[et al.]. (4/7). 2015. Sub-10 μm grain size, Ba_{1-x}CaxTi_{0.9}Zr_{0.1}O₃ (x=0.10 and x=0.15) piezoceramics processed using a reduced thermal treatment. *Smart Materials And Structures*. IOP Publishing Ltd.. 24(6). ISSN 0964-1726. SCOPUS (13) <https://doi.org/10.1088/0964-1726/24/6/065033>
 - 12 **Artículo científico.** Garcia-Zaleta, D. S.; Torres-Huerta, A. M.; Dominguez-Crespo, M. A...[et al.]. (5/6). 2014. Solid solutions of La-doped BiFeO₃ obtained by the Pechini method with improvement in their properties. *Ceramics International*. Elsevier Ltd. 40(7), pp.9225-9233. ISSN 0272-8842. WOS (34) <https://doi.org/10.1016/j.ceramint.2014.01.143>
 - 13 **Artículo científico.** Gonzalez, A. M. (4/6). 2014. Lead-free Ba_{0.9}Ca_{0.1}Ti_{0.9}Zr_{0.1}O₃ piezoelectric ceramics processed below 1300 degrees C. *Journal Of Alloys And Compounds*. Elsevier BV. 584, pp.28-33. ISSN 0925-8388. SCOPUS (41) <https://doi.org/10.1016/j.jallcom.2013.08.165>
 - 14 **Artículo de divulgación.** Amador M. González. (1/1). 2015. Ciencia Ficción e Ingeniería: de la imaginación a la realidad. *Revista Upm (Nueva Época)*. Universidad Politécnica de Madrid. (31), pp.39-41.
 - 15 **Capítulo de libro.** Pardo L; Villafuerte-Castrejón ME; Morán E...[et al.]. (6/6). 2018. Ecological, lead-free ferroelectrics. *Magnetic, Ferroelectric, And Multiferroic Metal Oxides*. pp.201-219. ISBN 10.1016/B978-0-12-811180-2.00009-8. SCOPUS (2) <https://doi.org/10.1016/B978-0-12-811180-2.00009-8>
 - 16 **Capítulo de libro.** N.Cereceda, B.Noheda, J.R. Fdez.del Castillo, J.A.Gonzalo, J. de Fruto...[et al.]. (6/6). 2008. Piezoelectric resonance investigation of Zr-rich PZT at room temperature. *Effective Field Approach To Phase Transitions And Some Applications To Ferroelectrics*. pp.377-384.
 - 17 **Capítulo de libro.** Amador M. González. (1/1). 2003. Determinación de propiedades piezoeléctricas. *Introducción A La Electrocerámica*. pp.23-1-23-9.

- 18 **Capítulo de libro.** Amador M. González. (1/1). 2003. Piezoelectricidad. Introducción A La Electrocerámica. pp.19-1-19-11.
- 19 **Capítulo de libro.** A M González y Ruth Maicas. (2/2). 1995. Dentalia, Un système expert pour la classification de restes osseux. Aplicaciones Informáticas En Arqueología: Teoría Y Sistemas. pp.231-238.
- 20 **Libro de divulgación.** Ruth Maicas, Amador M. González, Margarita Martínez, Ana Belén García,...[et al.]. (2/). 2019. Telecas, en los dos extremos del cable. Fundación General de la Universidad Politécnica de Madrid. ISBN 978-84-16397-92-1.
- 21 **Revistas de difusión General.** Pardo L; González AM; Bartolomé JF...[et al.]. (2/ 4). 2022. Editorial: special issue on PIEZO2017: Electroceramics for End Users IX. Advances In Applied Ceramics. Taylor & Francis LTD. 121(5-8), pp.157-158. ISSN 1743-6753. <https://doi.org/10.1080/17436753.2022.2141994>
- 22 Matutes-Aquino, J. A.; Botello-Zubiate, M. E.; Corral-Flores, V....[et al.]. (8/ 8). 2008. Synthesis and Characterization of Nickel Ferrite-Barium Titanate Ceramic Composites. Integrated Ferroelectrics. Taylor & Francis LTD. 101(1), pp.22-28. ISSN 1058-4587. (12) <https://doi.org/10.1080/10584580802451397>
- 23 de Frutos, J; Gonzalez, AM; Duro, C...[et al.]. (2/5). 1998. Poling process in ferroelectric ceramics. Electron Microscopy 1998, Vol 2. pp.733-734.
- 24 AlvarezArenas, G; Gonzalez, AM; Defrutos, J...[et al.]. (2/4). 1996. Piezoelectric characterisation of porous piezoceramics. Proceedings Of The IEEE Ultrasonics Symposium. The International Tissue Elasticity ConferenceTM. pp.519-522. ISSN 1051-0117. SCOPUS (9)
- 25 Lopez, F; Defrutos, J; Gonzalez, AM...[et al.]. (3/4). 1992. INTEGRATED OPTICAL FILTERS FOR INFRARED ELECTROOPTICAL GAS SENSORS. Sensors And Actuators B-Chemical. ELSEVIER SCIENCE SA. 6(1-3), pp.170-175. ISSN 0925-4005. WOS (10) [https://doi.org/10.1016/0925-4005\(92\)80051-X](https://doi.org/10.1016/0925-4005(92)80051-X)

C.2. Proyectos o líneas de investigación

- 1 **Proyecto.** EITD19217, MASTER ITA - Programme Execution - EIT - I&E Education Program 2019. European Institute of Innovation and Technology (EIT). GONZALEZ CRESPO, AMADOR MIGUEL. 01/01/2019-31/12/2019. 7.500 €. Investigador principal.
- 2 **Proyecto.** MAT2016-80182-R, Ensamblaje Dirigido de Cerámicas Funcionales a Escala Nanométrica: Materiales Fosforescentes y Sistemas Multiferroicos. Ministerio de Economía y Competitividad (MINECO/SEIDI). PEITEADO LOPEZ, MARCO. 30/12/2016- 29/12/2019. Miembro de equipo.
- 3 **Proyecto.** EIT Digital Master School Programmes. European Institute of Innovation and Technology (EIT). GONZALEZ CRESPO, AMADOR MIGUEL. 01/01/2018- 31/12/2018. 12.500 €. Investigador principal.
- 4 **Proyecto.** EIT Digital Master School Programmes. EIT ICT LABS IVZW; European Institute of Innovation and Technology (EIT). GONZALEZ CRESPO, AMADOR MIGUEL. 01/01/2017-31/12/2017. 21.930 €. Investigador principal.
- 5 **Proyecto.** MAT2013-47878-C2-2-R, Control del guiado y la conmutación de excitaciones de espín para pROcesado MAGNÓNico: anisotropías de intercara y redes de motivos litografiados. Ministerio de Economía y Competitividad (MINECO/SEIDI). CEBOLLADA BARATAS, FEDERICO ALBERTO; SANCHEZ AGUDO, MARTA. 01/01/2014- 31/12/2017. 91.120,41 €. Miembro de equipo.
- 6 **Proyecto.** MAT2013-40722-R, Procesamiento sostenible de nanoarquitecturas complejas basadas en óxidos. Ministerio de Economía y Competitividad (MINECO/SEIDI). PEITEADO LOPEZ, MARCO; DURO CARRALERO, MARIA DEL CORAL. 01/01/2014- 31/07/2017. 189.648,98 €. Miembro de equipo.
- 7 **Proyecto.** CB-2011-01 166108, Materiales cerámicos multifuncionales: sistemas ferroeléctricos y multiferroicos libres de plomo. Villafuerte Castrejón, María Elena. 01/01/2012-31/12/2014. 112.330 €. Miembro de equipo.
- 8 **Proyecto.** MAT2010-21088-C03-03, Grain boundary and interphase effects of single and multiferroic ceramics. Ministerio de Ciencia e Innovación (MICINN). FRUTOS VAQUERIZO, JOSE DE. 01/01/2011-30/06/2014. 121.000 €. Miembro de equipo.

- 9 **Proyecto.** C10091501, Grain Boundary and Interfase effects of single and multiferroic ceramics oxides for the spintronics. Ministerio de Ciencia e Investigación. FRUTOS VAQUERIZO, JOSE DE. 01/01/2011-31/12/2013. Miembro de equipo.
- 10 **Proyecto.** MAT2007-66845-C02-02, Nanostructured multifunctional ceramics through hierarchically ordered nanoparticles. Sub2. INAEL ELECTRICAL SYSTEMS S.A.; Keraben; Ministerio de Educación y Ciencia (MEC); Vicar S.A.. FRUTOS VAQUERIZO, JOSE DE. 01/10/2007-30/09/2010. Miembro de equipo.
- 11 **Proyecto.** AL08-P(I+D)-20, Desarrollo de materiales cerámicos multiferroicos basados en perovskitas de bismuto. GONZALEZ CRESPO, AMADOR MIGUEL. 13/01/2008-31/12/2008. 10.000 €. Investigador principal.
- 12 **Contrato.** CURSO SEÑALIZACIÓN Y CONMUTACIÓN. PROYECTO ABIERTO 01/06/2022-02/01/2025.

C.5. Estancias en centros de I+D+i públicos o privados

- 1 Instituto Politécnico do Cávado e do Ave. Portugal. 17/02/2013-21/02/2013. 4 días.
- 2 Universidad Nacional Autónoma de México (UNAM). México. Ciudad de México. 01/10/1990-31/12/1990. 3 meses.

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	Amalia		
Family name	Williart Torres		
Open Researcher and Contributor ID (ORCID) (*)	0000-0001-9963-9602		

(*) Mandatory

A.1. Current position

Position	Profesora Titular de Universidad		
Initial date	21/04/2003		
Institution	Universidad Nacional de Educación a Distancia		
Department/Center	Física Interdisciplinar	Facultad de Ciencias	
Country	Spain	Teleph. number	913987184
Key words	Radiaciones ionizantes. Interacción de la radiación con materiales de interés radiológico y medioambiental		

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

Period	Position/Institution/Country/Interruption cause
1/05/1990-1/05/1991	Profesora asociada a tiempo parcial/F. de Ciencias/UNED
1/05/1991-1/10/1999	Profesora asociada a tiempo completo/F.de Ciencias/UNED
1/10/1999-2/07/2001	PTEU interina//F. de Ciencias/UNED
1/07/2001-21/04/2003	PTEU /F .de Ciencias/UNED

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Licenciada en Ciencias Físicas	Universidad Complutense de Madrid	1988
Doctora en Ciencias Físicas	Universidad Complutense de Madrid	1996

(Include all the necessary rows)

Part B. CV SUMMARY

Valoración positiva de dos sexenios de investigación, el último concedido en resolución del 5 de junio de 2019.

Número total de citas: 1149

Promedio de citas: 9,3 citas/año

Publicaciones totales en Q1: 7

Índice h = 8

Participación en los sucesivos proyectos de investigación liderados por el IP Gustavo García Gómez-Tejedor del CSIC, en los que se ha estudiado la interacción de la radiación (electrones secundarios, rayos X, rayos gamma) con sistemas de interés biomédico y su relación con el daño por radiación (véase C2). Esta colaboración se ha llevado a cabo tanto en los locales del CSIC como en los de la UNED. Fruto de esta colaboración han sido varias publicaciones y la presentación de diversos resultados en congresos, tanto nacionales como internacionales.



En el laboratorio de interacción radiación-materia (Unidad Asociada al CSIC durante 11 años) sito en la Facultad de Ciencias de la UNED, cuya investigadora responsable es A. Williard, se ha puesto a punto un sistema experimental de rayos X para el estudio de las interacciones de electrones secundarios. Montaje de diversos sistemas espectroscópicos para realizar medidas de distintos emisores de radiación (I-125, Ru-106, entre otros) y de la interacción de las distintas emisiones (electrones, positrones, gamma) con varios materiales.

También ha realizado labores de gestión de la investigación, en el Comité de Organización de tres congresos celebrados en Madrid.

Además durante 9 años (2005-2014) ha realizado actividades de gestión de la investigación como Vicedecana de Investigación de la Facultad de Ciencias de la UNED.

En la actualidad es Directora del Departamento de Física Interdisciplinar (antes de los Materiales) de la UNED (desde noviembre 2015).

Ha participado en numerosas actividades de divulgación científica sobre temas relacionados con el uso de las Radiaciones Ionizantes, Energía e Impacto ambiental de la energía en colaboración con la Real Sociedad Española de Física, entre otros.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications

- Autores (p.o. de firma): A. Williard, A. Muñoz, D. Boscolo, E. Scifoni M. Krämer, G. García
Título: ***Study on Tl-204 simultaneous electron and photon spectra and their interaction with gold absorbers. Experimental results and Monte Carlo simulations.***
Ref. Nucl. Inst. Meth. Phys. Res. A
Volumen: 927 pags. 435-442. Fecha: Marzo 2019
- Autores (p.o. de firma): R. Colmenares, A. Williard, A. Muñoz, F. Blanco, G. García and K. Krupa
Título: ***A process to describe radiation damage at the molecular level. Application to I-125 seeds in water.***
Ref. Applied radiation and isotopes
Volumen: 140 pags. 163-170. Fecha: Mayo 2018
- Autores (p.o. de firma): A. Ferrer, M.Shaw y A. Williard
Título: ***Física Nuclear y de Partículas***
Fecha: 2013
Número de páginas: 520
Editorial: UNED 6104403GR02A01
Lugar de publicación: Madrid
- Autores (p.o. de firma): M.Shaw y A. Williard
Título: ***Física Nuclear y de Partículas: Problemas Resueltos***
Fecha: 2013
Número de páginas: 262
Editorial: UNED 6104403GR01A01
Lugar de publicación: Madrid
- Autores (p.o. de firma): M.C. Fuss, A. Muñoz, J.C. Oller, F. Blanco, A. Williard, P. Limão-Vieira, M.J.G. Borge, O. Tengbland, C. Huerga, M. Téllez and G. García
Título: ***Energy deposition by a ¹⁰⁶Ru/¹⁰⁶Rh eye applicator simulated using LEPTS, a Low-Energy Particle Track Simulation***
Ref. Applied Radiation and Isotopes
Volumen: 69 pags. 1198-1204 Fecha: Abril 2011
Lugar de publicación: Holland
- Autores (p.o. de firma): M.C. Fuss, A. Muñoz, J.C. Oller, F. Blanco, P. Limão-Vieira, A. Williard, C. Huerga, M. Téllez and G. García
Título: ***Energy deposition model for I-125 photon radiation in water***
Ref. Eur. Phys. J. D
Volumen: 60 pags. 203-208 Fecha: Octubre 2010



Lugar de publicación: Germany

- Autores (p.o. de firma): B. de Celis, R. de la Fuente, A. Williard, B. de Celis Alonso
Título: ***Coincidence measurements in $\alpha/\beta/\gamma$ spectrometry with phoswich detectors using digital pulse shape discrimination analysis***
Ref. Nucl. Inst. Meth. Phys. Res. A
Volumen: A 580 pags. 206-209 Fecha: Mayo 2007
Lugar de publicación: Holland
- Autores (p.o. de firma): M. Shaw, A. Báguena, A. Williard, G. García
Título: ***Development of an X-Ray installation for the study of secondary electrons: preliminary measurements and calculations***
Ref. Proceedings of “Second European IRPA Congress on radiation Protection”
Volumen: P-324 pag. 1-17 Fecha: Mayo 2006
Lugar de publicación: Paris
- Autores (p.o. de firma): A. Muñoz, A. Williard, G. García, J.M. Pérez
Título: ***A new approach to the modeling of low energy gamma photon interaction in air***
Ref. Proceedings of “11th International Congress of the International Radiation Protection Association”
Volumen: 3b28 pag. 1-10 Fecha: Mayo 2004
Lugar de publicación: Madrid
- Autores (p.o. de firma): A. Roldán, J.M. Pérez, A. Williard, F. Blanco and G. García
Título: ***Energy deposition model for low-energy electrons (0.01 – 10 keV) in air***
Ref. Journal of Applied Physics
Volumen: 95 Páginas, inicial: 5865 final: 5870 Fecha: Mayo 2004
Lugar de publicación: USA

C.2. Congress,

- Título: *Low energy particle track simulation for biomedical applications*
Autores: M.C. Fuss, A.G. Sanz, A. Muñoz, J.C. Oller, F. Blanco, A. Williard, C. Huerga, M. Tellez and G. García
Tipo de participación: Oral
Congreso: “Radam 2010” (Radiation damage in biomolecular systems)
Lugar de celebración: Madrid Fecha: 30 de junio – 4 de julio de 2010
- Título: *Analysis and modeling of secondary electron generation in condensed biomolecular systems*
Autores: A.G. Sanz, M.C. Fuss, A. Williard, C. Cruz, A. Perea, M.J.G. Borge, O. Tengbland, Y. Prezado, A. Muñoz, F. Blanco and G. García
Tipo de participación: Poster
Congreso: “Radam 2010” (Radiation damage in biomolecular systems)
Lugar de celebración: Madrid Fecha: 30 de junio – 4 de julio de 2010
- Título: *LEPTS, una simulación de trayectorias de partículas de baja energía, en aplicaciones biomédicas*
Autores: M.C. Fuss, A.G. Sanz, A. Muñoz, J.C. Oller, F. Blanco, A. Williard, C. Huerga, M. Tellez y G. García
Tipo de participación: Oral
Congreso: XXXIII Reunión Bienal de la Real Sociedad Española de Física
Lugar de celebración: Santander Fecha: 19-23 de septiembre de 2011
- Título: *Estudio de la absorción de las emisiones del Na²² por distintos materiales.*
Autores: A. Williard, A. Muñoz, F. Blanco y G. García
Tipo de participación: Oral
Congreso: XXXIII Reunión Bienal de la Real Sociedad Española de Física
Lugar de celebración: Santander Fecha: 19-23 de septiembre de 2011

C.3. Research projects,

- Título del proyecto: **“Radiological Effect of RADicals and MolEcular Radiosensitisers (REFRAMER)”**
Entidad financiadora: MICINN (PID20198-104727RB-C21)
Entidades participantes: CSIC - UNED – CIEMAT- Universidad Complutense de Madrid
Duración, desde: 2019 hasta: 2022
Investigador responsable: G. García Gómez-Tejedor (CSIC)
Número de investigadores participantes: 10
- Título del proyecto: **“Interacción de partículas de baja energía y radicales en aplicaciones biomédicas de la radiación”**
Entidad financiadora: MINECO (FIS2016-80440-p)
Entidades participantes: CSIC - UNED – CIEMAT- Universidad Complutense de Madrid
Duración, desde: 2017 hasta: 2019
Investigador responsable: G. García Gómez-Tejedor (CSIC)
Número de investigadores participantes: 10
- Título del proyecto: **“Interacción de la radiación a escala nanométrica y sus aplicaciones en radioterapia y radiodiagnóstico”**
Entidad financiadora: MINECO (FIS2012-31230)
Entidades participantes: CSIC - UNED – CIEMAT- Universidad Complutense de Madrid
Duración, desde: 2012 hasta: 2016
Investigador responsable: G. García Gómez-Tejedor (CSIC)
Número de investigadores participantes: 10
- Título del proyecto: **“Estudio de procesos atómicos y moleculares con aplicaciones en el uso biomédico de las radiaciones”**
Entidad financiadora: CICYT (FIS2009-10245)
Entidades participantes: CSIC - UNED – CIEMAT- Universidad Complutense de Madrid
Duración, desde: 2009 hasta: 2012
Investigadora responsable: G. García Gómez-Tejedor (CSIC)
Número de investigadores participantes: 7
- Título del proyecto: **“Estudio del daño por radiación producido por electrones secundarios en sistemas biomoleculares”**
Entidad financiadora: CSN
Entidades participantes: UNED
Duración, desde: 2004 hasta: 2009
Investigadora responsable: M. Shaw Martos (UNED)
Número de investigadores participantes: 2
- Título del proyecto: **“Interacción de electrones secundarios con la materia y sus implicaciones en el daño por radiación”**
Entidad financiadora: CICYT (BMF04648/FISI)
Entidades participantes: CSIC - UNED – CIEMAT- Universidad Complutense de Madrid
Duración, desde: 2004 hasta: 2007
Investigador responsable: G. García Gómez-Tejedor (CSIC)
Número de investigadores participantes: 7

Parte A. DATOS PERSONALES		Fecha del CVA	15/04/2024
Nombre y apellidos	Arantzazu Mascaraque Susunaga		
DNI/NIE/pasaporte		Edad	
Núm. identificación del investigador			
	Código Orcid		

A.1. Situación profesional actual

Organismo	Universidad Complutense de Madrid		
Dpto./Centro	Facultad de CC. Físicas		
Dirección	Av. Complutense s/n		
Categoría profesional	Catedrático		
Espec. cód. UNESCO	221109,221110,221114,221128,221191,220208		
Palabras clave	Física de Superficies. Propiedades magnéticas de láminas delgadas. Propiedades electrónicas y estructurales de sistemas de baja dimensionalidad. Transiciones de fase en superficies. Nanomagnetismo		

A.2. Formación académica (título, institución, fecha)

Licenciatura/Grado/Doctorado	Universidad	Año
Licenciatura en CC. Físicas. Especialidad de Óptica y Estructura de la Materia	Universidad Autónoma de Madrid	1994
Licenciatura en CC. Físicas. Especialidad de Física Teórica del Estado Solido	Universidad Autónoma de Madrid	1995
Doctor en CC. Físicas: "Pb/Ge(111) y Sn/Ge(111): estructura electrónica, geométrica y transición de fase", dirigida E. G. Michel.	Universidad Autónoma de Madrid	1999

A.3. Indicadores generales de calidad de la producción científica

SEXENIOS DE INVESTIGACIÓN

- Numero sexenios: 4 (1995-2000), (2001-2006), (2007-2012); (2013- 2018)

TESIS DOCTORALES

- 1 tesis doctoral dirigida: (Marzo 2009). Premio extraordinario de Doctorado
- 4 tesis doctoral co-dirigidas (Abril 2009, Mayo 2016, Diciembre 2019, Diciembre 2023)
- 2 tesis doctoral co-dirigidas en curso (fecha prevista lectura octubre 2024, octubre 2025)

PUBLICACIONES

- Total publicaciones científicas=75; 74% en Q1. Citas totales ISI-WOK>1700, h-index: 23.

Parte B. RESUMEN LIBRE DEL CURRÍCULUM

Arantzazu Mascaraque es Catedrático en el Dpto. de Física de Materiales de la Universidad Complutense de Madrid. Se doctoró en 1999 en la Universidad Autónoma de Madrid con la tesis doctoral titulada "Pb/Ge(111) y Sn/Ge(111): estructura electrónica, geométrica y transición de fase", dirigida por el Prof. E. G. Michel y que recibió el Premio Extraordinario de Doctorado. Realizó una estancia posdoctoral de 4 meses en la Universidad Técnica de Munich, en el Grupo de W. Moritz. Con posterioridad obtuvo una "Marie Curie" Fellowship para trabajar en el sincrotrón francés LURE, en Orsay Francia, durante 24 meses. En el año 2002 se reincorporó al sistema científico español como investigador en la Universidad Autónoma de Madrid, para incorporarse finalmente a la Universidad Complutense de Madrid en el año 2003 gracias al programa "Ramón y Cajal". En el año 2006 obtuvo un puesto permanente como Profesor Contratado Doctor, en 2009 fue Profesor Titular de Universidad y desde 2021 es Catedrático.

Su principal interés científico es el análisis de las propiedades fisicoquímicas de materiales de dimensionalidad reducida, tanto con técnicas sensibles al espacio recíproco

como con técnicas que sondan el espacio real. Dado que muchas de estas técnicas experimentales requieren luz monocromática sintonizable, gran parte de la investigación la ha realizado en Centros de Radiación Sincrotrón. Al principio de su carrera se centró en el estudio de la estructura electrónica utilizando la fotoemisión angular como principal técnica experimental, con el objetivo de analizar la superficie de Fermi de metales e interfases metal/semiconductor. Con esa técnica estudió las transiciones de fase en sistemas que presentan alta correlación electrónica, como los aislantes de Mott. Esta línea de trabajo tuvo gran repercusión y mereció una portada en *Phys. Rev. Lett* y fue objeto de reseña en la sección *News and Views* de la revista *Nature*. Más adelante, al incorporarse al Grupo de Ciencia de Superficies de la UCM extendió su trabajo al estudio con técnicas de microscopía de campo cercano, tanto STM como AFM. Estos últimos años ha ampliado su experiencia a otras técnicas de microscopía avanzadas, como la microscopía de fotoemisión (PEEM) y la de electrones de baja energía (LEEM), incluso con resolución en espín (SPLEEM), lo que le ha permitido extender su investigación al estudio de las propiedades magnéticas. Esta línea es en la actualidad uno de sus intereses principales. Como resultado de estos trabajos ha publicado un artículo sobre la estabilización de *skyrmiones* sin campo magnético externo a temperatura ambiente que forma parte de los “Highly Cited Papers” del WOK.

A lo largo de su carrera científica ha colaborado con diferentes grupos de investigación, tanto nacionales como internacionales, realizando estancias de investigación de larga duración. De entre todas ellas destaca la colaboración con el Grupo del Prof. K. Horn, en el *Fritz Haber Institut*, Berlín, Alemania (con una estancia de 13 meses) o el Grupo del Dr. A. K. Schmid en el *Lawrence Berkeley Lab*. Berkeley, EEUU (con una estancia de 17 meses). En el ámbito nacional mantiene varias colaboraciones estables entre las que destacan el Grupo del Dr. J. de la Figuera (IQFR-CSIC), con el que dirige desde hace 8 años una Unidad Asociada al CSIC, el Grupo del Prof. E.G. Michel (UAM) o el Grupo del Prof. J.E. Ortega (UPV).

Finalmente, y con relación a la gestión académica y de investigación, ha sido Vicedecana de Investigación de la Facultad de CC. Físicas en el periodo 2010-2014 y coordinadora del “Master Nanofísica y Materiales Avanzados” entre 2015 y 2017. Entre 2018 y 2021 dirigió la Plataforma de Talleres (Centro de Apoyo a la Investigación) de la UCM. Desde 2013 dirige el Grupo de Investigación UCM “Ciencia de Superficies y Nanoestructuras”. Desde 2022 es la coordinadora UCM del Hub “Future Materials” de la Alianza UNA.EUROPA.

Parte C. MÉRITOS MÁS RELEVANTES (ordenados por tipología)

C.1. 10 Publicaciones más relevantes en los últimos 10 años

1./ “Physical delithiation of epitaxial LiCoO₂ battery cathodes as a platform for surface electronic structure investigation”

Elena Salagre, Pilar Segovia, Miguel Ángel González-Barrio, Matteo Jugovac, Paolo Moras, Igor Pis, Federica Bondino, Justin Pearson, Richmond Shiwei Wang, Ichiro Takeuchi, Elliot J. Fuller, Alec A. Talin, Arantzazu Mascaraque, and Enrique G. Michel

ACS Ap. Mat. & Interfaces **15**, 36224 (2023), DOI: doi.org/10.1021/acsmi.3c06147

2./ “Fermi surface of LaSb₂ and direct observation of a CDW transition”

I. Palacio, J. Obando-Guevara, L. Chen, M.N. Nair, M.A. Gonzalez Barrio, E. Papalazarou, P. Le F`evre, A. Taleb-Ibrahimi, E.G. Michel, A. Mascaraque, A. Tejeda

Appl. Surf. Sci. **610**, 155477 (2023), DOI: 10.1016/j.apsusc.2022.155477

3./ “Imaging phase segregation in nanoscale Li_xCoO₂ single particles”

Fuller, E. Ashby, D.; Polop, C.; Salagre, E.; Bhargava, B.; Song, Y.; Vasco, E.; Sugar, J.; Albertus, P.; Menteş, T.; Locatelli, A.; Segovia, P.; González-Barrio, M.; Mascaraque, A.; Michel, E. G.; Talin, A. A.

ACS Nano **16**, 16363–16371 (2022); DOI: 10.1021/acsnano.2c05594

4./ “Large Dzyaloshinskii-Moriya interaction induced by chemisorbed oxygen on a ferromagnet surface”

G. Chen, A. Mascaraque, H. Jia, B. Zimmermann, M. Robertson, R. LoConte, M. Hoffmann, M. A. González Barrio, H. Ding, R. Wiesendanger, E. Michel, S. Blügel, A. K. Schmid, K. Liu *Science Advances* **6**, eaba4924, (2020); DOI: 10.1126/sciadv.aba4924

5./"In-plane Néel wall chirality and orientation of interfacial Dzyaloshinskii-Moriya vector in magnetic films"

M. Robertson, C. J. Agostino, G. Chen, S. P. Kang, A. Mascaraque, E. G. Michel, C. Won, Y. Wu, A. K. Schmid, K. Liu

Physical Review B **102**, 024417 (2020); DOI: 10.1103/PhysRevB.102.024417

6./"Observation of a topologically protected state in a magnetic domain wall stabilized by a ferromagnetic chemical barrier"

Ruiz-Gomez, S; Foerster, M; Aballe, L; Proenca, MP; Lucas, I; Prieto, JL Mascaraque, A; de la Figuera, J ; Quesada, A; Perez, L

Sci. Rep. **8** 16695 (2018); DOI: 10.1038/s41598-018-35039-6

7./"Memory effect and magnetocrystalline anisotropy impact on the surface magnetic domains of magnetite(001)"

Laura Martín-García, Gong Chen, Yaiza Montaña, Arantzazu Mascaraque, Beatriz M. Pabón, Andreas K. Schmid, Juan de la Figuera

Sci. Rep. **8** 5991 (2018); DOI:10.1038/s41598-018-24160-1

8./"Geometrically defined spin structures in ultrathin Fe₃O₄ with bulk like magnetic properties"

Sandra Ruiz-Gómez, Lucas Pérez, Arantzazu Mascaraque, Adrian Quesada, Pilar Prieto, Irene Palacio, Laura Martín-García, Michael Foerster, Lucía Aballe and Juan de la Figuera

Nanoscale **10**, 5566 (2018); DOI: 10.1039/C7NR07143D

9./"Formation of titanium monoxide (001) single-crystalline thin film induced by ion bombardment of titanium dioxide (110)"

B.M. Pabón, J.I. Beltran, G. Sanchez-Santolino, I. Palacio, J. Lopez-Sanchez, J. Rubio-Zuazo, J.M. Rojo, P. Ferrer, A. Mascaraque, M.C. Muñoz, M. Varela, G.R. Castro and O Rodríguez de la Fuente

Nature Commun. **6** (2015) 6147; DOI: 10.1038/ncomms7147.

10./"Room temperature skyrmion ground state stabilized through interlayer exchange coupling"

G. Chen, A. Mascaraque, A. T. N'Diaye and A. K. Schmid

Appl. Phys. Lett. **106**, (2015) 242404; DOI:10.1063/1.4922726.

WOK Highly cited paper.

C.2. Proyectos como IP

1.-Título: "Compuestos basados en nanohilos para la fabricación de imanes permanentes" TED2021-130957B-C52

Entidad financiadora: Ministerio de Ciencia e Innovación Co-IP: A. Mascaraque

2.-Título: "New materials for efficient magnetic switching at the nanoscale" PID2020-117024GB-C43

Entidad financiadora: Ministerio de Ciencia e Innovación Co-IP: A. Mascaraque

3.-Título: "Nuevos materiales para el control de la dinamica de paredes de dominio magnetico excitadas con corrientes polarizadas en espin" MAT2017-87072-C4-2-P

Entidad financiadora: Ministerio de Economía y Competitividad Co-IP: A. Mascaraque

4.-Título: "Nuevos materiales para el control de la dinamica de paredes de dominio magnetico excitadas con corrientes polarizadas en espin" MAT2014-52477-C5-2-P

Entidad financiadora: Ministerio de Economía y Competitividad Co-IP: A. Mascaraque

5.-Título: “Propiedades electrónicas y estructurales de moléculas auto-ensambladas en interfases oxido/metal” MAT2010-21156-C03-02

Entidad financiadora: Ministerio de Ciencia y Tecnología, IP: A. Mascaraque

6.-Título: “Propiedades estructurales y electrónicas en materiales de dimensionalidad reducida: transiciones de fase y confinamiento electrónico” FIS2007-64982

Entidad financiadora: Ministerio de Ciencia y Tecnología, IP: A. Mascaraque

C.3. Patentes

United States Patent No: 8,826,726 B2 / Date of Patent: 9 sept 2014

Título: Hydrogen sensitive magnetic structure: Gas sensor

Inventors: SCHMID, A. K. MASCARAQUE, A. SANTOS B.; DE LA FIGUERA, J.

Laboratorio: Lawrence Berkely Lab, International Electron-microscopy Center

C.4. Conferencias, seminarios y presentaciones

- 6 Ponencias invitadas en Congresos
- Mas de 20 Seminarios en Centros de Investigacion
- Mas de 180 presentaciones en Congresos

C.5. Experiencia en Centros de Radiacion Sincrotron

Gran parte de la investigacion se ha realizado en Centros de Radiacion Sincrotron. Todas las estancias han sido sometidas a aceptación por comité científico. Ratio de éxito >90%

- Más de 75 estancias en Laboratorios de Radiación Sincrotrón (1 semana de promedio por estancia), incluyendo 9 sincrotrones europeos y 1 en EEUU.

C.6. Experiencia en dirección y organización de actividades de I+D

Organización (junto con el Prof. A. Tejeda) del Workshop Hispano Francés "Novel topics in surfaces and interfaces" en el Synchrotron "Soleil", Paris, Francia. Enero 2012

Miembro del Comité Organizador del Congreso Internacional ACSIN-10 (Atomically Controlled Surfaces, Interfaces and Nanostructures) en Granada (España), Septiembre 2009

Miembro del Comité Organizador del Congreso Internacional RIVA-online 2021. Octubre 2021

C.7. Méritos docentes (últimos 10 años)

.- Docencia impartida en los Grados de Física, Grado en Ingeniería de Materiales, Grado en Ingeniería Química, Grado en Química, Master de Nanofísica y Materiales Avanzados y Master del Profesorado.

.- Docencia impartida teórica y práctica (laboratorios)

.- Coordinación del "Master Nanofísica y Materiales Avanzados" entre 2015 y 2017

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	Eva María		
Family name	Fernández Sánchez	Date:	
ID number			
Open Researcher and Contributor ID (ORCID) (*)	0000-0003-2085-0478		

(*) *Mandatory*

A.1. Current position

Position	Associate Professor (Titular de Universidad)		
Initial date	30/09/2020		
Institution	Universidad Nacional de Educación a Distancia (UNED)		
Department/Center	Departamento de Física Fundamental	Facultad de Ciencias	

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

Period	Position/Institution/Country/Interruption cause
05/03/2020-29/09/2020	Tenured Professor / UNED / Spain
01/11/2015-04/03/2020	Ramón y Cajal contract / UNED / Spain
01/11/2012-31/10/2015	Postdoc / UNED / Spain
16/03/2008-31/10/2012	Postdoc / Instituto de Ciencia de Materiales de Madrid (ICMM) / Consejo Superior de Investigaciones Científicas (CSIC) / Spain
01/03/2006-29/02/2008	Postdoc / Technical University of Denmark / Denmark
01/01/2002-31/12/2005	Predoc FPU (beca de formación de personal universitario) / Universidad de Valladolid / Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Physics degree	Universidad de Valladolid	2001
Physics PhD	Universidad de Valladolid	2005

(Include all the necessary rows)

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

- 44 JCR articles (most in Q1). Citations: 2050. H-index: 18
- 5 articles with more than 100 citations.
- PI of a national project (along with Javier Rodríguez Laguna).
- PI of a research group at UNED.

Trajectory. I graduated in Physics at Universidad de Valladolid in 2001. Then I started my research career with a FPU grant from the Spanish Ministry of Science to work on the PhD at the department of “Física Teórica, Atómica y Óptica” at Universidad de Valladolid supervised by Prof. Luis C. Balbás. In December 2005 I obtained the PhD degree with the highest marks. My PhD was awarded Special Doctorate Award by Universidad de Valladolid in 2007. From March 2006 to March 2008 I joined as postdoc at the Technical University of Denmark for two years. From March 2008 to October 2018 I worked as a researcher at Insituto de Ciencia de Materiales de Madrid (ICMM) which is part of the Consejo Superior de Investigaciones Científicas (CSIC), firstly with a JaeDoc Postdoctoral contract and then with a Comunidad de Madrid postdoctoral contract associated to project. Since November 2012 I develop my research work at the department of Física Fundamental of Universidad Nacional de Educación a Distancia, initially with a competitive postdoctoral contract of UNED and since November



2015 with a Ramón y Cajal contract. Finally, I obtained a permanent position in the same department in March 2020.

Scientific publications. I have published 44 papers in JCR journals (one Angew. Chem. Int., one Physical Review Letters and seven Physical Review B), which have received more than 2000 citations altogether. Fifteen of my papers have received more than 25 citations (one of them has received more than 500 citations) and my Hirsch index is $h=18$.

Funding. I have participated in 12 research projects, one international project funded by the Danish Research Agency and 6 national projects (one of them in collaboration with Osnabrück University, Germany). At this moment I am PI of a national project (Ref. PID2019-105182GB-I00). In 2017 and in 2019 I was assigned a 1 year undergraduate contract under the competitive Programa de Garantía Juvenil de la Comunidad de Madrid.

Since 2022 I am evaluator of national project for the Agencia Estatal de Investigación.

Awards. I was awarded the L'Oreal-UNESCO prize for Women in Science in Spain 2017, and the Prize of the Real Sociedad Española de Física – Fundación BBA for Young Researchers in theoretical physics in its 21th edition (year 2007) in 2008.

Other contributions. I am PI of the research group of the Statistical Mechanics of Complex Systems group at UNED.

I have supervised four master thesis and four bachelor thesis.

From 2018 I am an editorial board member for “Revista Española de Física”.

Recently, I have carried out scientific outreach such as giving a conference at the academic act of San Alberto Magno for the Faculty of Science of UNED 2018, giving a Masterclass within the “Stem Talent Girl Proyecto de innovación educativa” program in Valladolid (February 2019) and publishing an article at “Revista Española de Física”.

Research lines.

My research is focused on the analysis of the structural, electronic and thermodynamic properties, by means of first-principles simulation methods, of new tentative materials for applications in catalysis.

I work on two research lines:

1. Nanometric cluster

Improvement and proposal of catalysts for the adsorption of H_2 , O_2 , CO , NO on doped clusters. The main interest is the search for new catalysts more active that reduce air pollutant emissions into the atmosphere and more efficient materials for hydrogen storage. The analysis of the role played by the dopant atom in the reactivity of these aggregates according to their size and composition allows to improve or design new more efficient catalysts for the oxidation of CO and NO *decomposition* (avoiding or reducing their emission to the atmosphere) or for H storage (the main difficulty for the use of hydrogen as an energy source is its storage in a safe, reliable and compact way).

2. Analysis of the liquid-solid interface: the wetting problem in smooth and rough surfaces.

This problem presents a great technological interest as the partial or complete wetting of the surface by the fluid is one of the main influences on a catalyst efficiency. A partial wetting situation, where the fluid only wet a part of the catalyst, implies a low use of the catalyst, as well as the formation of hot spots and, in addition, affects its selectivity.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications

1. E. M. Fernández and L. C. Balbás. *Adsorption of multiple NO molecules on Au_{10}^- and Au_9Zn^- planar clusters. A comparative DFT study.* Phys. Chem. Chem. Phys. 25, 17176 (2023).

2. E. M. Fernández and L. C. Balbás. *Interactions of nitric oxide molecules with pure and oxidized silver clusters Ag_n^\pm/Ag_nO^\pm ($n=11-13$): A computational study*. J. of Chem. Phys. 157, 074310 (2022).

In this paper we show that species Ag_n^\pm and Ag_nO^\pm with odd number of electrons are more reactive toward the adsorptions of one and two NO molecules than their neighbors.

3. E. M. Fernández, S. N. Santalla, J. E. Alvarellos, J. Rodríguez-Laguna. *Nanowire reconstruction under external magnetic fields*. J. of Chem. Phys. 153, 244106 (2020).

Can nanowires reconstruct differently in the presence of external magnetic (or electric) fields? After our calculations, we can conjecture that this can indeed be the case.

4. E. M. Fernández and L. C. Balbás. *Multiple adsorption of molecular oxygen on small Au/Pd cationic clusters at finite temperature. A van der Waals density functional study*. J. of Chem. Phys. 114, 224308 (2016).

The reactivity of Au_n^+ cluster toward O_2 is strongly enhanced when Au atoms are changed by Pd ones for all cluster sizes.

5. E. Chacón, E. M. Fernández and P. Tarazona. *Effect of dispersion forces on the capillary-wave fluctuations of liquid surfaces*. Phys. Rev. E (89), 042406 (2014).

Shows molecular dynamics evidence for the nonanalytic effects of the long-range dispersion forces on the capillary waves fluctuations of a Lennard-Jones liquid surface.

6. E. M. Fernández, E. Chacón, P. Tarazona, A. O. Parry and C. Rascón. *Intrinsic Fluid Interfaces and Nonlocality*. Phys. Rev. Lett. 111, 096104 (2013).

Explores the local or nonlocal nature of the interfacial Hamiltonians that are used to analyze the structure and fluctuations of a liquid-gas interface.

7. E. M. Fernández, A. Vega and L. C. Balbás. *Theoretical study of Al_nV^+ clusters and their interaction with Ar*. J. Chem. Phys. 139, 214305 (2013).

DFT calculations confirms that the V atoms on Al_nV^+ clusters becomes encapsulated at the critical size of 17 atoms as suggested photofragmentation mass experiments.

8. E. M. Fernández et. al. (1/11) *Scaling relationships for adsorption energies on transition metal oxide, sulfide, and nitride surfaces*. Ang. Chem. Int. ed. 107, 4683 (2008).

We propose a method that may facilitate the description of the bonding of gas molecules to transition metal oxides, sulfides, and nitrides by density functional theory calculations.

9. E. M. Fernández, J. M. Soler and L. C. Balbás. *Planar and cage-like structure of gold clusters: Density-functional pseudopotential calculations*. Phys. Rev. B 73, 235438 (2006). In this paper we analyze the influence of the exchange-correlation functional (LDA and GGA) in the structure of formation of planar and pure surface (cage-like) clusters.

10. E. M. Fernández, J. M. Soler, I. L. Garzón and L. C. Balbás. *Trends in the structure and bonding of noble metal clusters*. Phys. Rev. B 70, 165303-14 (2004).

Analysis of the differences and similarities between small clusters of noble metals (gold, silver and copper; both neutral and charged).

C.2. Congress, indicating the modality of their participation (invited conference, oral presentation, poster)

1 *Adsorption of multiple NO molecules on Au_{10}^- and Au_9Zn^- planar clusters. A comparative DFT study*. ISSPIC XXIII, Berlin, Germany (2023). Poster presentation.

2. *H_2 adsorption on Al_nCo^+ clusters*. Gordon Research Conference on Clusters and Nanostructures. Les Diablerets, Switzerland (2019). Poster presentation.

3. *Multiple adsorption of molecular oxygen on small Au/Pd cationic clusters at finite temperature. A van der Waals density functional study*. ISSPIC XVIII, Jyväskylä, Finland (2016). Poster presentation.



4. *Static polarizability of Ar-AuX complexes (X = F, Hg) and Au_n clusters. DFT calculations with a non local correlation van der Waals functional compared to GGA results.* ISSPIC XV, Oaxaca, Mexico (2010). Oral presentation.
5. *Aplicación del ISM al estudio de la transición de mojado.* FISES09, Huelva, Spain (2009). Oral presentation.
6. *O₂ adsorption on cationic gold clusters pure and doped with a 3d transition metal.* XXX Reunión bienal de la RSEF, Ourense, Spain (2005). Oral presentation.
7. *Theoretical study of O₂ and CO adsorption on gold clusters in gas phase and supported on alumina nano-particles and surfaces.* XXX Reunión bienal de la RSEF, Ourense, Spain (2005). Oral presentation.
8. *Trends in the structure and bonding of pure and doped noble metal clusters. Application to O₂ and CO adsorption.* Quantum system in chemistry & physics, Les Houches, France (2004). invited conference.
9. *Trends in the structure and bonding of neutral and charged noble metal clusters. Siesta-Meeting,* Madrid, Spain (2004). Oral presentation.
10. *Tendencias en la estructura atómica y enlace químico de agregados neutros y cargados de metales nobles.* Segunda reunión mexicana de físico-química teórica, Guanajuato, Mexico (2003). Oral presentation.

C.3. Research projects, indicating your personal contribution. In the case of young researchers, indicate lines of research for which they have been responsible.

1. *Quantum Complex Systems: Fundamentals and Applications.* Ministerio de Ciencia, Innovación e Universidades. 06/2019-05/2022 PI: Eva María Fernández (UNED) and Javier Rodríguez-Laguna (UNED) Role: IP1.
2. *Structure and dynamics of complex fluids and their interfaces.* Ministerio de Ciencia e Innovación. 2011-2013; Enrique Chacón Fuertes (CSIC). Researcher.
3. *Structure, dynamics and electronic properties of atomic clusters, nanoalloys, interfaces and metallic liquids of technological interest in spintronics, catalysis and nuclear reactors.* Junta de Castilla y León. 2011-2013. Andrés Aguado Rodríguez (UVa). Researcher.
4. *Modeling and simulation of complex systems. Comunidad de Madrid. 2010-2013. Enrique Lomba García (CSIC).* Researcher.
5. *Electronic and morphological properties of nanostructures materials of interest in spintronics, catalysis and new nanoalloys.* Ministerio de Ciencia e Innovación. 2009-2011. Andrés Vega (UVa). Researcher.
6. *New electrode materials for hydrogen evolution.* Danish Research Agency, Ministry of Science Technology and Innovation (Dinamarca). 2005-2007. Ib Chorkendorff (UTD). Researcher.
7. *Theoretical study of structural, electronic and thermal properties of nanodimensional systems of technological interest.* Ministerio de Ciencia y Tecnología. 2005-2007. Andrés Vega (UVa). Researcher.

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	Javier		
Family name	Rodríguez Vázquez de Aldana		
Gender (*)		Birth date (dd/mm/yyyy)	
ID number			
e-mail	jrval@usal.es	URL Web	https://diarium.usal.es/jrval/ https://produccioncientifica.usal.es/investigadores/55973/detalle
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-5264-8525		

(*) Mandatory

A.1. Current position

Position	Profesor Titular de Universidad		
Initial date	16/08/2018		
Institution	Universidad de Salamanca		
Department/Center	Física Aplicada, Facultad de Ciencias		
Country	Spain	Teleph. number	923294678
Key words	Photonics, Lasers, Non-linear optics, Laser-matter interaction, Ablation, Microfabrication		

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

Period	Position/Institution/Country/Interruption cause
2002-2006	Ayudante de Facultad, Universidad de Salamanca
2006-2018	Contratado Doctor, Universidad de Salamanca

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Science	Universidad de Salamanca	2001
Graduate in Physics	Universidad de Salamanca	1997

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

The scientific career of the researcher has been mainly focused on the interaction of ultrashort laser pulses with matter, both from the fundamental point of view as in the applications one. He did his PhD in the Ultraintense Lasers Group (Prof. Luis Roso, University of Salamanca) in theory and numerical simulation, and then he moved to experimental research in ultrashort laser pulses. At present, he is member of the “Aplicaciones del Láser y Fotónica” Research Group (Prof. Luis Plaja) where he leads the research line about fabrication of photonic devices with femtosecond lasers.

He is coauthor of more than 170 papers in JCR-indexed journals, being more than 140 related to materials processing with ultrashort lasers. In his professional trajectory, he was involved in the “Laser Service” of the University of Salamanca, giving scientific and technical support to external users, as well as in the “Spanish Center for Pulsed Lasers-CLPU” (Spanish scientific infrastructure) being responsible for the Materials Processing Laboratory. In the last years, his work at the University of Salamanca has been mainly focused on the design and fabrication of photonic devices by femtosecond laser irradiation for different fields: biosensing, atmospheric sensing, lab-on-a-chip devices or astro-photonics. He has also experience and publications in subcellular laser surgery, biological tissues laser damage, and processing of bio-compatible materials. In his current research, he holds active scientific collaboration (several JCR joint papers) with more than 12 international research groups.



He has participated as researcher in more than 25 funded projects, being PI in 3 of them (national and regional research programs). In his professional career it should be highlighted also the research-transfer activity, participating in more than 50 research contracts (art. 83 LOU) both with national as international companies/institutions, being PI in 10 of them.

Concerning teaching and training skills, he has supervised 4 Doctoral Thesis (Dra. Carolina Romero (2012), Dra. Rocío Borrego (2013), Dr. Gabriel Castillo (2017), Dr. Javier García (2021)), 14 Master Thesis (Máster en Física y Tecnología de los Láseres, Universidad de Salamanca) and 10 undergraduate final projects (Grado en Física, Universidad de Salamanca). Moreover, he participates in several science dissemination programs, such as “Salamanca Ciudad de Saberes” or “Science for gifted children”, offering guided visits to the Laser Laboratory and interactive experiments.

Concerning evaluation of research activities, he has taken part of 10 thesis dissertation committees, he has been international evaluator of research projects (Hertha Fimberg Program (Austria), Programa Ciencia de Frontera (México)) and taken part of the selection committee for a Marie Curie Grant Agreement (Cofund Martí Marques, Universitat Rovira Virgili, Spain, 2020 and 2021 calls). Moreover, he has experience as reviewer for more than 30 JCR international journals (editorials Nature.com, Optical Society of America, Springer, IEEE, SPIE, IOP, MDPI).

General quality indicators:

- *Research evaluations* (6-years): 4/4 approved.
- *Bibliometric data* (extracted from Web of Science):
 - H-index: 32.
 - Number of papers in indexed WoS journals: 205.
 - Total number of citations: 4111 (3459 without self-citations).
 - Citations/year in the last 5 years: 370.

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

C.1. Publications

1. M. Grotevent, S. Yakunin, D. Bachmann, [...] I. Shorubalko, (5/9) “Integrated photodetectors for compact Fourier-transform waveguide spectrometers” *Nature Photonics* 17, 59 (2023).
2. E. Kifle P. Loiko, C. Romero, [...] X. Mateos, (4/10) “Watt-level ultrafast laser inscribed thulium waveguide lasers”, *Progress in Quantum Electronics* 72, 100266 (2020).
3. J.R. Vázquez de Aldana, C. Romero, J. Fernandez, G. Gorni, M.J. Pascual, A. Durán y R. Balda, “Femtosecond laser direct inscription of 3D photonic devices in Er/Yb-doped oxyfluoride nano-glass ceramics” *Optical Materials Express* 10, 2695 (2020).
4. E. Kifle, P. Loiko, J.R. Vázquez de Aldana, [...] X. Mateos, “Passively Q-switched fs-laser-written thulium waveguide laser based on evanescent field interaction with carbon nanotubes”, *Phot. Res.* 6, 971-980 (2018).
5. W. Nie, R.Li, Ch. Cheng, [...] F. Chen, (7/9) “Room-temperature subnanosecond waveguide lasers in Nd:YVO₄ Q-switched by phase-change VO₂: A comparison with 2D materials”, *Scientific Reports* 7, 46162 (2017).
6. G.H. Li, HY. Li, R.M. Gong, Y. Tan, J.R. Vázquez de Aldana, F. Chen, “Intracavity biosensor based on the NdYAG waveguide laser: tumor cells and dextrose solutions”, *Photonics Research* 5, 728-732 (2017).
7. R. He, J.R. Vázquez de Aldana, G. Lifante, F. Chen, D. Jaque, “Two-photon luminescence thermometry: towards 3D high-resolution thermal imaging of waveguides”. *Optics Express* 24, 16156-16166 (2016).
8. F. Chen, and J. R. Vazquez de Aldana, “Optical waveguides in crystalline dielectric materials produced by femtosecond- laser micromachining,” *Laser & Photonics Reviews* 8, 251-275 (2014).



9. Y. Jia, C. Cheng, J.R. Vázquez de Aldana, [...] F. Chen, "Monolithic crystalline cladding microstructures for efficient light guiding and beam manipulation in passive and active regimes", *Scientific Reports* 4, 5988 (2014).
10. F. Chen and JR Vázquez de Aldana, "Direct Femtosecond Laser Writing of Optical Waveguides in Dielectrics" Book Chapter in "Laser Micro-Nano-Manufacturing and 3D Microprinting, Springer Series in Materials Science, Anming Hu Editor, ISBN 978-3-030-59312-4, ISSN 0933-033X (2020).

C.2. Congress (*invited, last 5 years*)

1. I. López-Quintás, N. Sevilla-Sierra, J.R. Vázquez de Aldana. "Second harmonic generation in femtosecond laser-induced damage structures in NdYAG crystals", *International Symposium on Optical Materials*, Tarragona (Spain, 2023). Invited talk.
2. J.R. Vázquez de Aldana. "Dispositivos fotónicos 3D en medios cristalinos: fabricación con pulsos ultracortos y aplicaciones", 1st North-West meeting of Young Researchers, Santiago de Compostela (Spain, 2022). Invited talk.
3. J.R. Vázquez de Aldana. "Femtosecond laser inscription in crystalline materials for 3D integration of photonic elements", *Iberoamerican Optics Meeting*, Cancún (México, 2019). Invited talk.
4. C. Romero, J.R. Vázquez de Aldana, J. García, A. Ródenas, F. Chen, X. Mateos, P. Moreno. "New strategies for the fabrication of photonic devices by direct inscription with femtosecond laser pulses", *International Conference on Advanced Laser Technologies (ALT)*, Praga (República Checa, 2019). Invited talk.
5. X. Mateos, E. Kifle, P. Loiko, C. Romero, J. Rodríguez, A. Ródenas, S. Choi, F. Rotermund, V. Petrov, M. Aguiló, F. Díaz, "Femtosecond laser written waveguide lasers at 2 microns", *Conference on Lasers and Electrooptics-Europe*, Munich (Alemania, 2019). Invited talk.

C.3. Research projects.

1. "Estudio y desarrollo de un proceso de fabricación aditiva de alta protección basado en la deposición directa de metal por hilo mediante multi laser (LWMD) para el procesado de materiales de alta reactividad. Aplicación a implantes en Ti64-ELI. ATiLA (PLEC2022-009392)". Funding agency: Ministerio de Ciencia e Innovación. 10/2022-10/2025. 1.002.162 €. Role: researcher, ultrafast ablation experiments.
2. "Advanced Ultrafast Optics and Integrated photonics for organ-on-chip and biomedical applications (AUTOGRAPH) (PID2020-119818GB-I00)". P.I.: Iñigo Sola y Javier Rodríguez (Universidad de Salamanca). Funding agency: Ministerio de Ciencia e Innovación. 09/2021-12/2024. 157.300 €. Role: P.I.
3. "Nuevas aplicaciones de la fotónica ultrarrápida en el campo de la fecundación in vitro (FIV): lab-on-a-chip y monitorización no invasiva (SA136P20)". P.I.: Javier Rodríguez Vázquez de Aldana (Universidad de Salamanca). Funding agency: Consejería de Educación de la Junta de Castilla y León. 11/2020-12/2023. 264.000 €. Role: P.I.
4. "Structured attosecond pulses for ultrafast nanoscience (Attoestructura, 851201)". P.I.: Carlos Hernández García (Universidad de Salamanca). Funding agency: European Research Council, ERC starting grant. 3/2020—08/2025. 1.425.000€. Role: researcher, non-linear ultrafast optics experiments.
5. "Generación, modelado y caracterización de haces láser pulsados especiales: nuevas herramientas fotónicas (SA287P18)". P.I.: Iñigo Sola (Universidad de Salamanca). Funding agency: Consejería de Educación de la Junta de Castilla y León. 1/2019-12/2021. 119.499 €. Role: researcher, application of integrated photonics to pulse characterization.
6. "Fotónica integrada ultrarrápida (FIS 2017-87970-R)". P.I.: Pablo Moreno e Iñigo Sola (Universidad de Salamanca). Funding agency: Ministerio de Economía y Competitividad. 01/2018-12/2020. 90.750 €. Role: researcher, femtosecond laser microstructuring of compact photonic devices.



7. “Desarrollos tecnológicos de los láseres de potencia y pulso corto: Fabricación de dispositivos fotónicos 3D y aplicaciones de la respuesta óptica ultrarrápida (SA046U16)”. P.I.: Luis Plaja (Universidad de Salamanca). Funding agency: Junta de Castilla y León. 01/2016 a 12/2018. 119.949 €. Role: researcher, microfabrication of optimized optical waveguides in crystals.
8. “Fabrication of Biocompatible Green colloidal nanoparticles by spatial and temporal focusing of femtosecond pulses (AICO/2016/036)”. P.I.: Gladys Minguez Vega (Universitat Jaume I, Castelló). Funding agency: Generalitat Valenciana. 01/2016 a 12/2017. 40.000 €. Role: researcher, laser fabrication of nanoparticles in colloidal suspension.
9. “Fronteras de la Óptica Ultrarrápida: ciencia y aplicaciones de los pulsos de femto y attosegundo (FIS2013-44174-P)”. P.I.: Luis Plaja Rustein y Pablo Moreno Pedraz (Universidad de Salamanca). Funding agency: Ministerio de Economía y Competitividad. 01/01/2014- 31/12/2016. 100.000 €. Role: researcher, femtosecond laser microstructuring of transparent dielectrics.
10. “Science and applications of Ultrashort Ultraintense Lasers SAUUL (CSD2007-00013)”. Funding agency: Ministerio de Educación y Ciencia. P.I.: Luis Roso. (Universidad de Salamanca). 01/2007-12/2013. 4.500.000 €. Role: researcher, non-linear optics experiments and ultrafast ablation studies.

C.4. Contracts, technological or transfer merits

1. “Optical waveguides for astrophotonic fabricated by directed laser irradiation” Institut de Planetologie et d’Astrophysique de Grenoble. 1/02/2022 a 30/04/2022. P.I.: C. Romero Vázquez. 3.000 €
2. “Fabrication of complex photonic circuits in glasses with femtosecond pulses (ID18LI7L)” Institut de Planetologie et d’Astrophysique de Grenoble. 15/11/2019 a 29/02/2020. P.I.: J.R. Vázquez de Aldana. 1.500 €
3. “Fabrication of complex photonic circuits in glasses with femtosecond pulses” Institut de Planetologie et d’Astrophysique de Grenoble. 1/5/2019 a 15/9/2020. P.I.: J.R. Vázquez de Aldana. 3.000 €
4. “Inscription of circular cladding waveguides by femtosecond laser irradiation (2017/00233/001)”. MICOS Engineering for Remote GmbH (Suiza). 15/9/2017 a 15/10/2017. P.I.: J.R. Vázquez de Aldana. 795 €
5. “Fabricación de patrones de micro-poros en muestras de grafeno por irradiación con pulsos ultracortos (2017/00248/001)”. Universitat Politècnica de Valencia. 1/7/2017 a 30/9/2017. P.I.: J.R. Vázquez de Aldana. 1.355 €
6. “Fabrication of surface cladding waveguides in LiNbO₃ crystals by femtosecond laser irradiation (2017/00009/001)”. MICOS Engineering GmbH (Suiza). 10/1/2017 a 30/06/2017. P.I.: J.R. Vázquez de Aldana. 2.500 €
7. “Tabletop Coherent X-ray nano-bio imaging at the space-time limits (NANO-X). University of Colorado at Boulder (USA). 29/11/2016 a 30/4/2018. P.I.: Carlos Hernández. 22.500 €
8. “Fabrication of optical waveguides in glasses with femtosecond pulses (2017/00009/001). Institut de Planetologie et d’Astrophysique de Grenoble. 15/10/2016 a 31/12/2016. P.I.: J.R. Vázquez de Aldana. 3.000 €
9. “Fabrication of cladding waveguides in LiNbO₃ crystal by femtosecond laser” (2015/00099/001).” MICOS Engineering GmbH. 01/05/2015 a 01/06/2015. P.I.: J.R. Vázquez de Aldana. 785 €. “Fabrication of optical waveguides in LiNbO₃ crystal by femtosecond laser irradiation (2015/00098/001).” MICOS Engineering GmbH. 01/05/2015. P.I.: J.R. Vázquez de Aldana. 735 €
10. “Preliminary tests for the fabrication of 3D optical waveguides in crystals by femtosecond laser irradiation”. Institut de Planetologie et d’Astrophysique de Grenoble. 14/04/2015. P.I.: J.R. Vázquez de Aldana. 750 €

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	Leonor		
Family name	Chico Gómez		
Gender (*)			
Open Researcher and Contributor ID (ORCID) (*)	0000-0002-7131-1266		

(*) Mandatory

A.1. Current position

Position	Catedrática de Universidad (equiv. to Full Professor in USA)		
Initial date (dd/mm/yyyy)	11/07/2023		
Institution	Universidad Complutense de Madrid (UCM)		
Department/Center	Dept. Física de Materiales / Facultad de Ciencias Físicas		
Country	Spain	Phone number	
Keywords	Nanomaterials, quantum transport, low-dimensional physics		

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

Period (dd/mm/yyyy)	Position/Institution/Country/Interruption cause
30/10/2020-10/7/2020	Profesora Titular de Universidad (equiv. to Assoc. Prof. In USA) promotion
06/08/2008-29/10/2020	Científica Titular (Staff Scientist) / Consejo Superior de Investigaciones Científicas /Spain / position@UCM
15/11/1999-05/08/2008	Profesora Titular de Universidad (Asoc. Prof.) / Universidad de Castilla-La Mancha (UCLM) / Spain / position@CSIC
01/10/1997-14/11/1999	Profesora Asociada (non-permanent Prof.) / UCLM / Spain / promotion
23/12/1996-30/09/1997	Ayudante de Facultad (Teaching Assistant) / UCLM / Spain / promotion
12/01/1996-22/12/1996	Investigadora Contratada (Research Associate) / CSIC / Spain / position@UCLM
01/01/1994-31/12/1995	Becaria Postdoctoral MEC (Postdoctoral fellow Spanish Min. of Science and Education) / University of California at Berkeley (UCB) / position@CSIC
01/01/1990-31/12/1993	Becaria Predoctoral MEC (Predoctoral fellow Spanish Min. of Science and Education) / CSIC/ position@UCB

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Physics	Universidad Complutense de Madrid / Spain	1993
Licenciada (graduate-MSc) in Physics	Universidad Complutense de Madrid / Spain	1989

(Include all the necessary rows)

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

I currently hold a Full Professorship at Universidad Complutense de Madrid (UCM), to where I moved in 2020 thanks to a Program of Excellence of University Professors, funded by V Plan Regional de Investigación Científica e Innovación Tecnológica (PRICIT), the V Regional Plan for Scientific Research and Technological Innovation.

Within the field of the theory and simulation of materials, I have worked in diverse materials and systems with the common characteristic of being low-dimensional, employing both



analytical and numerical approaches. I have studied semiconductor quantum wells and superlattices, magnetic multilayers, carbon-based materials, such as **carbon nanotubes** and **graphene, two-dimensional (2D) materials, topological insulators** and semiconductor nanowires. Besides their electronic and more specially their transport properties, I have modeled magnetic, optical, vibrational, and more recently, thermoelectric properties. Spin-orbit interaction in low-dimensional materials, its relationship with symmetry and its relevance in spin-dependent transport has been also one important contribution in the last years.

I am currently interested in effects relevant in low dimensions, i.e., one-dimensional (1D) and 2D materials, in which defects and **symmetry** may play a crucial role and are key ingredients in the proposal of novel nanoscale devices. Along this line, **twisted bilayer graphene, moiré physics**, and **2D penta-materials**, all being low-symmetry materials, constitute a central part of my current research, as well as the exploration of their novel, nontrivial and topological phases of matter.

Generation of knowledge. I have published more than **90 articles**, most of them in high-impact journals. Among those, it can be highlighted **4 Phys. Rev. Lett., 1 Nano Lett., 5 Carbon and 7 Nanoscale**. They sum more than 3100 citations in Web of Science (WoS) and more than 4100 in Google Scholar (GS). My Hirsch index is $h=26$ (WoS) / $h=28$ (GS) as of 27/08/24. Due to my research activity, I have been granted **5 sexenios** (6-year research periods positively evaluated), the 6th being active.

During my career, I have contributed with several scientific findings, among which I would highlight the following:

- Modeling of carbon nanotube junctions. The prediction of carbon nanotube junctions, later found experimentally, and the calculation of transport in carbon nanotubes were **Highly Cited Papers** during the 1996-2006 decade and considered seminal works in the field.
- Identification of localized states in carbon nanotube junctions with graphene edge states.
- Obtention of symmetry relations for the different components of the spin-resolved conductance in quasi-1D systems, allowing for the prediction of spin-polarized currents in spin-orbit systems without magnetic fields.
- Prediction of topologically confined states in corrugated bilayer graphene, and its control with electric potentials.
- Exploration of the topological properties of 2D penta-materials.

Supervisor of 3 PhD students, Dr. Hernán Santos Expósito, Extraordinary Prize for PhD Thesis at UNED (2012), Dr. Sergio Bravo Castillo, in co-supervision with Prof. Mónica Pacheco, Universidad Técnica Federico Santa María, Chile (2019) and Carlos Rojas Leiva, in co-supervision with Prof. Pedro Orellana, Universidad Técnica Federico Santa María, Chile (2023). Currently supervising the PhD thesis of MSc. Olga Arroyo Gascón (since 2019, defense expected in September 2024) and MSc. Pablo Moles Matías (since 2022).

Responsible for predoctoral stays of 6 PhD students since 2003. I have also **supervised 1 postdoctoral researcher**, 2013-2015, and **received 2 sabbatical professors** 2014 and 2016.

I have made **10 international research stays** of 1 month or longer, e.g. **2-year postdoc** at University of California, Berkeley (1994-1995) and a 1-month stay as **Invited Professor** at U. Nicolaus Copernicus, Torun, Poland (2011), **financed by the EU Human Capital and Mobility Program**. The number of international short stays is **45**.

I act as **Referee** for several **international journals**, among others Physical Review Letters, Nano Letters, Phys. Rev. B, Phys. Rev. Applied, Carbon, Nanoscale, Nanotechnology, New Journal of Physics... I am also **Reviewer** for several **national and international funding agencies**, e.g. European Science Foundation, Agencia Nacional de Evaluación y Prospectiva (National Grants, RyC-JdIC 2009 and RyC 2023), Comisión Nacional de Investigación Científica y Tecnológica (CONICYT) Chile, Department of Energy (USA), Nadorowe Centrum Nauki (National Science Centre), Poland.



I have served (2018-2022) as **Vocal** in the Steering Committee of the **Women in Physics** Group of the Spanish Royal Physics Society. Since 2012 I am in the Scientific Advisory Committee of El CSIC en la Escuela. I am currently a member of Ciencia a la Carta, non-profit organization for science outreach, with workshops and talks, and participate regularly in the **11February** initiative, International Day for Women and Girls in Science.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions) I have listed 10 recent publications (last 5 years) plus the most relevant article of my career.

(1) Victor Nuñez, Sergio Bravo, J.D. Correa, Leonor Chico and M. Pacheco, *Higher-order obstructed atomic insulator phase in pentagonal monolayer PdSe₂*, *2D Materials* **11** (2024) 015015.

(2) Olga Arroyo-Gascón, Ricardo Fernández-Perea, Eric Suárez Morell, Carlos Cabrillo and Leonor Chico, *Universality of moiré physics in collapsed chiral carbon nanotubes*, *Carbon* **205** (2023) 394-401.

(3) Sergio Bravo, M. Pacheco, J.D. Correa and Leonor Chico, *Topological bands in monolayer PdSe₂*. *Phys. Chem. Chem. Phys.* **24** (2022) 15749 – 15755.

(4) Olga Arroyo-Gascón, Yuriko Baba, Jorge I. Cerdá, Oscar de Abril, Ruth Martinez-Casado, Francisco Domínguez-Adame, Leonor Chico, *Persistence of symmetry-protected Dirac points at the surface of the topological crystalline insulator SnTe upon impurity doping*. *Nanoscale* **14** (2022) 7151-7162 (selected for back cover of the issue).

(5) D. Vaquero, V. Clericò, J. Salvador-Sánchez, E. Díaz, F. Domínguez-Adame, L. Chico, Y. M. Meziani, E. Diez, J. Quereda, *Fast response photogating in monolayer MoS₂ phototransistors*. *Nanoscale* **13** (2021) 16156 -16163.

(6) S. Bravo, M. Pacheco, V. Nuñez, J.D. Correa, L. Chico, *Two-dimensional Weyl points and nodal lines in pentagonal materials and their optical response*. *Nanoscale* **13** (2021) 6117-6128.

(7) Hernán Santos, A. Latgé, L. Brey and Leonor Chico, *Spin-polarized currents in corrugated graphene nanoribbons*. *Carbon* **168** (2020) 1-11.

(8) Olga Arroyo-Gascón, Ricardo Fernández-Perea, Eric Suárez Morell, Carlos Cabrillo, and Leonor Chico, *One-dimensional moiré superlattices and flat bands in collapsed chiral carbon nanotubes*. *Nano Lett.* **20** (2020) 7588-7593.

(9) J. D. Correa, M. Pacheco, Sergio Bravo, and Leonor Chico, *Electronic and magnetic properties of pentagonal nanoribbons*. *Carbon* **162** (2020) 209-219.

(10) F. J. Culchac, R. R. Del Grande, Rodrigo B. Capaz, Leonor Chico, E. Suárez Morell, *Flat bands and gaps in twisted double bilayer graphene*. *Nanoscale* **12** (2020) 5014 – 5020.

(11) L. Chico, V. H. Crespi, L.X. Benedict, S. G. Louie, and M. L. Cohen, *Pure Carbon Nanoscale Devices: Nanotube Heterojunctions*, *Phys. Rev. Lett.* **76** (1996) 971-974. **863 citations WoS (27/08/24), Highly Cited Paper in the decade 1996-2006.**

C.2. Congress, indicating the modality of their participation (invited conference, oral presentation, poster)

(1) L. Chico, *Nanoestructuras de carbono: localización y estados topológicos*. **Invited Plenary Talk**. LXV Congreso de la Sociedad Mexicana de Física, Zacatecas (México), 2-8 October 2022.

(2) L. Chico, *Topología no trivial en materiales pentagonales bidimensionales*. **Opening Invited Talk**. Decimosexto Taller de Física de la Materia Condensada y Molecular de la Universidad Autónoma del estado de Morelos: Cuernavaca (México) 20-22 June 2022.

(3) L. Chico, *Nontrivial band topology in palladium diselenide monolayer*. **Invited Talk**. NANO 2022, Sevilla (Spain), 2-6 June 2022.

(4) L. Chico, *Controlling the layer localization of topological states in gated bilayer graphene*. **Invited Talk**. Brazilian Workshop of Semiconductor Physics 2019. Fortaleza (Brasil) 18-22 November 2019.

(5) L. Chico, *All-electrical production of spin-polarized currents: The Rashba effect*. **Invited Talk**. 2D Materials: From fundamentals to spintronics. Natal (Brasil). 16 Sept.- 4 Oct. 2019.

(6) L. Chico, *Grafeno bicapa: dos mejor que una*. **Invited Minicourse**. X Escuela de Nanoestructuras. Valparaíso (Chile). 14-18 January 2019.

(7) L. Chico, *All-electrical production of spin-polarized currents in carbon systems*. **Invited Talk**. Coma-ruga 2018, 14th International Workshop on Magnetism & Superconductivity at the Nanoscale. Coma-ruga (Spain). 2-6 July 2018.

(8) L. Chico, P. A. Orellana, L. Rosales, M. Pacheco, *Spin and charge caloritronics of bilayer graphene flakes*. **Invited Talk**. IX Escuela de Nanoestructuras. Valparaíso (Chile) 7-10 January 2018.

(9) Leonor Chico, Eric Suárez Morell, Luis Brey. *Circular dichroism in twisted bilayer graphene*. **Oral Communication**. SLAFES XXIII Bariloche (Argentina). 10-13 April 2018.

(10) L. Chico, L. Brey, H. Santos, J. E. Alvarellos, A. Latgé. *Symmetries of quantum transport with Rashba spin-orbit: carbon spintronics*. **Invited Talk**. XL Encontro Nacional de Física de la Materia Condensada. Búzios (Brasil) 27-31 August 2017.

C.3. Research projects, indicating your personal contribution (selection, last 5 years) .

(1) PID2022-136285NB-C31 Fenómenos cuánticos emergentes en nanomateriales rotados y con ingeniería de simetrías (EQUASET), MICINN, from 01/09/2023 to 31/08/2026, **Principal Investigators (coordinators)**: Francisco Domínguez-Adame and **Leonor Chico Gómez** 150.000 euro, (subproject1).

(2) PGC2018-097018-B-I00, Topología y correlaciones en materiales cuánticos y tecnologías cuánticas de estado sólido, AEI, from 01/01/2019 to 30/09/2022 (extended). PIs: M.J. Calderón and R. Aguado, (**L. Chico: Research team member**), 242.000 euro.

(3) FIS2015-64654-P, Correlaciones, aspectos cuánticos y topología en materiales emergentes, DGICYT, from 01/01/2016 to 31/12/2019 (extended), **Principal Investigators**: M.J. Calderón and **Leonor Chico** (CSIC), 107.800 euro.

Part A. PERSONAL INFORMATION		CV date	20/01/2024
First and Family name	Manuel Muñoz Sánchez		
Social Security, Passport, ID number		Age	
Researcher codes	Open Researcher and Contributor ID (ORCID**)	0000-0003-0781-4763	
	SCOPUS Author ID (*)		
	WoS Researcher ID (*)	D-9532-2011	

(*) *Optional*

(**) *Mandatory*

A.1. Current position

Name of University/Institution	Consejo Superior de Investigaciones Científicas		
Department	Instituto de Tecnologías Físicas y de la Información (ITEFI)		
Address and Country	Calle Serrano, 144; 28006 Madrid (España)		
Phone number	E-mail		
Current position	Tenured Scientist	From	2006
Key words	Nanoscience; nanotechnology; spintronics; magnonics		

A.2. Education

PhD, Licensed, Graduate	University	Year
PhD in Physics	Universidad Autónoma de Madrid	2002

A.3. General indicators of quality of scientific production (see instructions)

As indicators of the quality of scientific production, it should be noted that Manuel Muñoz has four Sexenios (six-year research periods positively evaluated). He also has 4 positive evaluations of the research merits of CSIC (QUINQUENIOS). He has been **co-director of 3 doctoral theses**.

As can be seen in the Clarivate, he has authored **54 articles** in international journals (ISI journals), all of them within the first quartile (Q1). These publications have resulted in a **total of 2469 citations**. The resulting **h-index is 23**

Part B. CV SUMMARY (max. 3500 characters, including spaces)

Manuel Muñoz, is tenured scientist in the Institute of Physical and Information Technologies of the Spanish Research Council (CSIC). His research activity focuses on fundamental and applied research on various topics within the field of nanoscience and nanotechnology. He has extensive experience in advanced techniques for the fabrication, characterization and manipulation of nanostructures.

In particular, the scientific activity of Manuel Muñoz is mainly focused to the manufacture and study of nanostructures for their application in spin electronics devices for computing and telecommunications. He is an expert in nanofabrication techniques and electrical characterization, both DC and RF.

He has participated in multiple national research projects, he has been PI on 4 projects of the national R&D plan ("**Interference phenomena and manipulation of magnetic domain walls in nanostructures**") (MAT2009-08771); "**Manipulation of magnetic domain walls by means of magnetic currents for high frequency applications and logic devices**") (MAT2014-52477-C5-3-P) and "**RF studies of heterostructures for application in magnetic devices**" (MAT2017-87072-C4-4-P); design and characterization of magnonics devices (PID2020-117024GB-C44). Manuel is also PI of the CSIC in the European project entitled "**K-NET: k-space Neural computation with magnEtic exciTations (FETOPEN Grant agreement ID: 899646)**". He has participated in several European projects related to the theme of this proposal: "**Computational Magneto-electronics**" dedicated to research on new strategies for reading and writing magneto-electronic devices Manuel took part in the design of the devices and also in the



development of nanofabrication techniques of nanowires and nano-spin valves, and in the development of the experimental setups used in the spin transfer experiments
In the line of spin transfer phenomena in spin valve nano-columns, the influence of the insertion of thin rare earth layers to improve the stability of the layers has been studied and the properties for microwave emission of these structures have been characterized.
In collaboration with CNRS-THALES, he has studied the formation of vortices in the magnetic layers of spin valve nanocolumns. He has investigated the magnetotransport properties of these structures and how to improve the bandwidth of these RF emitters through the generation of several coupled vortices and the synchronization of the emission of several nano columns.
More recently he has been involved in the field of Magnonics, the branch of spintronics that studies the design of structures for the generation, control and detection of spin waves, in order to implement new functionalities in logic devices and information processing. . In this field, he has developed experimental systems for measuring the dynamics of the magnetization of nanostructures at high frequencies and for the injection and detection of spin waves.

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

C.1. Publications (*see instructions*)

AUTHORS: Srivastava, T; Merbouche, H; Yemeli, IN; Beaulieu, N (Beaulieu, N.); Ben Youssef, J; **Muñoz, M**; Che, P; Bortolotti,; Cros, V; Klein, O; Sangiao, S; De Teresa, JM; Demokritov, SO; Demidov, VE; Anane, A; Serpico, C; d'Aquino, M; de Loubens, G
TITLE: Identification of a Large Number of Spin-Wave Eigenmodes Excited by Parametric Pumping in Yttrium Iron Garnet Microdisks
REF. JOURNAL/BOOK: **PHYSICAL REVIEW APPLIED** 4, 19, 064078 (2023).
DOI: 10.1103/PhysRevApplied.19.064078

AUTHORS: Castilla, D ; **Muñoz, M**, Sinusia, M; Yanes, R; Prieto, JL
TITLE: Magnetization process of a ferromagnetic nanostrip under the influence of a surface acoustic wave
REF. JOURNAL/BOOK: **SCIENTIFIC REPORTS**, Article number: 8586 (2021).
DOI: 10.1038/s41598-021-88113-x

AUTHORS: Riccardo Frisenda, Yue Niu, Patricia Gant, **Manuel Muñoz** & Andres Castellanos-Gomez
TITLE: Naturally occurring van der Waals materials
REF. JOURNAL/BOOK: **npj 2D Materials and Applications** 4, Article number: 38 (2020).
DOI: 10.1038/s41598-020-66144-0

AUTHORS: Castilla, D ; Yanes, R; Sinusia, M; Fuentes, G; Grandal, J ; Maicas, M; Alvarez-Arenas, TEG ; **Muñoz, M** ; Torres, L ; López, L ; Prieto, JL
TITLE: Magnetization process of a ferromagnetic nanostrip under the influence of a surface acoustic wave
REF. JOURNAL/BOOK: **SCIENTIFIC REPORTS**, Article number: 9413 (2020).
DOI: 10.1038/s41598-020-66144-0

AUTHORS: Proenca, MP ; **Muñoz, M**; Villaverde, I; Migliorini, A; Raposo, V; Lopez-Diaz, L; Martinez, E; Prieto, JL
TITLE: Deterministic and time resolved thermo-magnetic switching in a nickel nanowire
REF. JOURNAL/BOOK: **SCIENTIFIC REPORTS**, Article number: 17339 (2019).
DOI: 10.1038/s41598-019-54043-y



AUTHORS: Li, Y ; Naletov, VV ; Klein, O; Prieto, JL; **Muñoz, M** ; Cros, V ; Bortolotti, P ; Anane, A ; Serpico, C; de Loubens, G
TITLE: Nutation Spectroscopy of a Nanomagnet Driven into Deeply Nonlinear Ferromagnetic Resonance
REF. JOURNAL/BOOK: **PHYSICAL REVIEW X**, Article number: 041036 (2019).
DOI: 10.1038/srep32781

AUTHORS: Migliorini, A ; Kuerbanjiang, B; Huminiuc, T; Kepaptsoglou, D ; **Muñoz, M**; Cunado, JLF; Camarero, J ; Aroca, C; Vallejo-Fernandez, G; Lazarov, VK; Prieto, JL
TITLE: Spontaneous exchange bias formation driven by a structural phase transition in the antiferromagnetic material
REF. JOURNAL/BOOK: **NATURE MATERIALS**, 17, pages28–35(2018)
DOI: 10.1038/NMAT5030

AUTHORS V. E. Demidov, M. Evelt, V. Bessonov, S. O. Demokritov, J. L. Prieto, **M. Muñoz**, J. Ben Youssef, V. V. Naletov, G. de Loubens, O. Klein, M. Collet, P. Bortolotti, V. Cros & A. Anane
TITLE: Direct observation of dynamic modes excited in a magnetic insulator by pure spin current
REF. JOURNAL/BOOK: **Scientific Reports 6**, Article number: 32781 (2016).
DOI: 10.1038/srep32781

AUTHORS M. Collet, X. de Milly, O. d'Allivy Kelly, V. V. Naletov, R. Bernard, P. Bortolotti, J. Ben Youssef, V. E. Demidov, S. O. Demokritov, J. L. Prieto, **M. Muñoz**, V. Cros, A. Anane, G. de Loubens & O. Klein
TITLE: Generation of coherent spin-wave modes in yttrium iron garnet microdiscs by spin-orbit torque
REF. JOURNAL/BOOK: **Nature Communications**, Volume 7 Pages: 8 (2016).
DOI: 10.1038/ncomms10377

AUTHORS A. Hamadeh, O. d'Allivy Kelly, C. Hahn, H. Meley, R. Bernard, A. H. Molpeceres, V. V. Naletov, M. Viret, A. Anane, V. Cros, S. O. Demokritov, J. L. Prieto, **M. Muñoz**, G. de Loubens and O. Klein
TITLE: Full Control of the Spin-Wave Damping in a Magnetic Insulator Using Spin-Orbit Torque
REF. JOURNAL/BOOK: **Phys. Rev. Lett.** ,113, 197203 (2014).
DOI: 10.1038/ncomms10377

AUTHORS **Muñoz, Manuel**; Prieto, José L.
TITLE: Suppression of the intrinsic stochastic pinning of domain walls in magnetic nanostripes
REF. JOURNAL/BOOK: **Nature Communications**, Volume 2, id. 562 (2011).
DOI: 10.1038/ncomms1575

AUTHORS C. Hahn;V. V. Naletov;G. de Loubens;O. Klein¹;O. d'Allivy Kelly;A. Anane;R. Bernard;E. Jacquet;P. Bortolotti;V. Cros;J. L. Prieto and **M. Muñoz**
TITLE: Measurement of the intrinsic damping constant in individual nanodisks of Y₃Fe₅O₁₂ and Y₃Fe₅O₁₂|Pt
REF. JOURNAL/BOOK: **Applied Physics Letters**, Volume 104, 152410 (2014).
DOI: 10.1063/1.4871516



C.2. Research projects (Only those that Manuel is PI)

PROJECT NAME: "k-space Neural computation with magnEtic exciTations"

ENTIDAD FINANCIADORA: UNION EUROPEA (FETOPEN) Grant agreement ID: 899646

BUDGET: 295 787,50 EUR

FROM: Ene 2021

TO: DIC 2024

PRINCIPAL INVESTIGATOR: M. Muñoz

PROJECT NAME: "INGENIERIA DE DEFORMACION DE ONDAS DE ESPIN"

ENTIDAD FINANCIADORA: Agencia Estatal de Inv.

BUDGET: 90.750 EUR

FROM: SEP 2021

TO: AUG 2024

PRINCIPAL INVESTIGATOR: M. Muñoz

PROJECT NAME: "Estudios RF de heteroestructuras para aplicación en dispositivos magnónicos"

ENTIDAD FINANCIADORA: Agencia Estatal de Inv.

BUDGET: 62.500,00 EUR

FROM: Ene 2017

TO: DIC 2020

PRINCIPAL INVESTIGATOR: M. Muñoz

PROJECT NAME: Manipulación de paredes de dominio magnético mediante corrientes magnónicas para aplicaciones de alta frecuencia y dispositivos lógicos"

ENTIDAD FINANCIADORA: MINECO

BUDGET: 72.600,00 EUR

FROM: Ene 2015

TO: DIC 2017

PRINCIPAL INVESTIGATOR: M. Muñoz

PROJECT NAME: FENOMENOS DE INTERFERENCIA Y MANIPULACION DE PAREDES DE DOMINIO MAGNETICO EN NANOESTRUCTURAS

ENTIDAD FINANCIADORA: CICYT

BUDGET: 48.400,00 EUR

FROM: Ene 2010

TO: DIC 2013

PRINCIPAL INVESTIGATOR: M. Muñoz

PROJECT NAME: DESPLAZAMIENTO DE PAREDES DE DOMINIO MEDIANTE TRANSFERENCIA DE ESPIN EN NANOHILOS CON ANISOTROPIA MAGNETICA PERPENDICULAR

ENTIDAD FINANCIADORA: MECD

FROM: Febrero 2012

TO: Agosto 2012

PRINCIPAL INVESTIGATOR: M. Muñoz

PROJECT NAME: Fabricación electroquímica y caracterización de dispositivos de espintrónica molecular

ENTIDAD FINANCIADORA: CSIC

FROM: Sep 2007

TO: DIC 2009

PRINCIPAL INVESTIGATOR: M. Muñoz

C.3. Contracts, technological or transfer merits

C.4. Patents

INVENTORS: Vincent Cros, Julie Grollier, M. Muñoz, Albert Fert and Frédéric Nguyen Van Dau

SPINTRONIC DEVICE WITH CONTROL BY DOMAIN WALL DISPLACEMENT INDUCED BY A CURRENT OF SPIN-POLARIZED CARRIERS

Nº DE SOLICITUD: US20090273421

PAÍS DE PRIORIDAD: EEUU

FECHA

DE

PRIORIDAD:

Extensión Internacional

Nov 2009

ENTIDAD TITULAR: Thales research and Technology

CV Date	21/01/2024
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Part A. PERSONAL INFORMATION

First Name	Miguel Angel		
Family Name	Rubio Alvarez		
Sex		Date of Birth	
ID number Social Security, Passport			
URL Web			
Email Address	mar@fisfun.uned.es		
Open Researcher and Contributor ID (ORCID)	0000-0002-4210-0443		

A.1. Current position

Job Title	Catedrático de Universidad		
Starting date	1996		
Institution	Universidad Nacional de Educación a Distancia		
Department / Centre	Física Fundamental / Facultad de Ciencias		
Country	Spain	Phone Number	(+34) 913987129
Keywords	Monolayers; Rheology; Colloids; Complex fluids; Biological physics		

A.2. Previous positions (Research Career breaks included)

Period	Job Title / Name of Employer / Country
2016 - 2024	Director del Departamento de Física Fundamental / Universidad Nacional de Educación a Distancia
2010 - 2013	Vicerrector Primero / Universidad Nacional de Educación a Distancia
2009 - 2013	Vicerrector de Profesorado / Universidad Nacional de Educación a Distancia
1997 - 1999	Director del Departamento de Física Fundamental / Universidad Nacional de Educación a Distancia

Part B. CV SUMMARY

Scientific achievements: I started my PhD studies at the end of 1981 under the supervision of Prof. Manuel G. Velarde. In the pre-doctoral period, I carried out experimental research stays at CEA (Saclay, France, 6 months in total; supervised by Dr. Pierre Bergé and Dr. Monique Dubois), where we obtained the first experimental demonstration of the Type III intermittency route to chaos, and at the Istituto Nazionale di Ottica (Florence, Italy, 16 months in total; supervised by Prof. F.Tito Arcelli and Dr. Sergio Ciliberto), where I studied the existence of localized and traveling wave perturbances in Rayleigh-Bénard convection. I obtained a PhD in Physics in 1985 from UNED and a permanent position as Associate Professor at UNED in 1988. I published several scientific articles stemming from my PhD Thesis which had wide repercussions, e.g., 2 in Phys Rev. Lett., with 191 and 174 citations, respectively, according to Web of Science - WoS -, (325 and 291 according to Scholar Google - SG-). From November 1988 to January 1990, I enjoyed a research stay at Prof. Jerry P. Gollub's lab (Haverford College, USA), funded by a senior fellowship from the Scientific Office of NATO, during which I worked on the structure of fluid interfaces in porous media imbibition as model systems for surface growth with quenched noise, also with wide repercussion (Phys. Rev. Lett., citations: 288 in WoS and 397 in SG).

At the beginning of 1990 I started the activities of the Complex Systems Laboratory at UNED. Since then my interests have focused on experimental Soft Matter Physics (colloids and interfaces). In 1996 I obtained a Professor position at UNED, in the Applied Physics area. Between 1996 and 2009 I focused on magnetic colloids, collaborating with GG Fuller (U. Stanford, USA) and A.A. García (U. Arizona State, USA). We obtained relevant results on the

aggregation kinetics of superparamagnetic particles in suspension under external magnetic fields and on the use of magnetic particles in the microfluidics of drops on superhydrophobic surfaces. In July 2009 I was appointed Vice-Rector for Teaching Staff of the UNED, in September 2010 also First Vice-Rector, positions that I held for 4 years (until July 15, 2013). In 2013 I started a new line of research focused on the interfacial mechanical properties of Langmuir monolayers, where we have achieved significant improvements in the magnetic needle interfacial shear rheometer (ISR), using magnetic microwire probes and a mobile magnetic trap to force their movement. The results are impressive gains in the instrument's resolution (3 decades) and in the stability of the sample-probe system. Furthermore, we have developed specific flow field-based data analysis techniques to the magnetic trap ISR, that we have later adapted to other ISRs based on standard rotational rheometers with different geometries (bicone, micro-button, and double wall ring).

Overall, I have published 71 scientific articles in highly recognized scientific journals such as Phys. Rev. Lett. (7), Phys. Rev. E (9), Appl. Phys. Lett. (3), J. of Rheology (3), J. Colloid Interf. Sci. (3), Adv. Coll. Interf. Sci (1), Current Opinion in Coll. Interf. Sci. (1), etc., which have accumulated 2006 (WoS) and 2991 (SG) citations. This scientific activity has been funded uninterruptedly since 1992 through 16 research projects, in which I was PI or co-PI, submitted to competitive calls published by European, national and regional institutions.

Technology transfer achievements: The work on the magnetic trap ISR produced 2 national and 1 european patents, that were licensed to Biolin Scientific for the commercialization, through its subsidiary KSV.Nima, of a new interfacial shear rheometer. I have collaborated with KSV-Nima in all of the phases of commercial instrument development, and I am part of the standing contracts for software development.

Researchers' formation: I have supervised or co-supervised 8 PhD students. All of them obtained their PhD with the maximum grade (Sobresaliente "Cum laude") and 5 of them obtained the (competitive) Premio Extraordinario de Doctorado (Extraordinary Doctorate Prize) of UNED's Faculty of Science in their corresponding year. Their later research careers have led 7 of them to spend postdoc periods at prestigious foreign or national institutions (U. Oxford; I. Paul Pascal, CNRS; U. Wisconsin-Madison; I. Microelectrónica Madrid, CSIC; EPFL, Laussane; U. Stanford; I. Laue-Langevin, Grenoble) and 6 of them to be appointed as Associate Professors in other universities (1 in Universidad Complutense de Madrid and 3 in Universidad Politécnica de Madrid) or at UNED (2 in a different department than mine).

At present my main research interests are: i) the development of new interfacial rheology techniques, both shear and dilatational, and ii) the interfacial rheology of monomolecular films of soft matter systems (fatty acids, insoluble polymers, proteins, lipids of biomedical interest, biofilms, etc.).

Part C. RELEVANT ACCOMPLISHMENTS

C.1. Most important publications in national or international peer-reviewed journals, books and conferences

AC: corresponding author. (n° x / n° y): position / total authors. If applicable, indicate the number of citations

- 1 Scientific paper.** Pablo Sánchez Puga; Javier Tajuelo Rodríguez; Juan Manuel Pastor Ruiz; Miguel Ángel Rubio Álvarez. 2020. Flow field-based data analysis in interfacial shear rheometry. *Advances in Colloid and Interface Science*. Elsevier. <https://doi.org/10.1016/j.cis.2020.102332>
- 2 Scientific paper.** Pablo Sánchez-Puga; Javier Tajuelo; Juanma Pastor; M.A. Rubio. 2019. BiconeDrag—A data processing application for the oscillating conical bob interfacial shear rheometer. *Computer Physics Communications*. Elsevier. 239, pp.184-196.

- 3 **Scientific paper.** E. Guzmán; J. Tajuelo; J.M. Pastor; M.A. Rubio; F. Ortega; R.G. Rubio. 2018. Shear rheology of fluid interfaces: Closing the gap between macro- and micro-rheology. *Current Opinion in Colloid & Interface Science*. Elsevier. 37, pp.33-48. <https://doi.org/10.1016/j.cocis.2018.05.004>
- 4 **Scientific paper.** J. Tajuelo; J.M. Pastor; M.A. Rubio. 2017. Flow field based data processing for the oscillating conical bob interfacial shear rheometer. *Journal of Rheology*. The Society of Rheology. 62-1, pp.295-312. <https://doi.org/10.1122/1.5012764>
- 5 **Scientific paper.** J. Tajuelo; J.M. Pastor; M.A. Rubio. 2016. A new interfacial stress rheometer based on a mobile magnetic trap. *Journal of Rheology*. American Institute of Physics. <https://doi.org/http://dx.doi.org/10.1122/1.4958668>
- 6 **Scientific paper.** J. Tajuelo; J.M. Pastor; F. Martínez-Pedrero; M. Vázquez; F. Ortega; R.G. Rubio; M.A. Rubio. 2015. Magnetic microwire probes for the magnetic rod interfacial stress rheometer. *Langmuir*. American Chemical Society. 31-4, pp.1410-1420. <https://doi.org/DOI:10.1021/la5038316>
- 7 **Scientific paper.** Dominguez-Garcia, P; Melle, S; Pastor, JM; Rubio, MA. 2007. Scaling in the aggregation dynamics of a magnetorheological fluid. *PHYSICAL REVIEW E*. 76-5. ISSN 1539-3755.
- 8 **Scientific paper.** Garcia, AA; Egatz-Gomez, A; Lindsay, SA; et al; Wang, J. 2007. Magnetic movement of biological fluid droplets. *JOURNAL OF MAGNETISM AND MAGNETIC MATERIALS*. 311-1, pp.238-243. ISSN 0304-8853.
- 9 **Scientific paper.** Egatz-Gomez, A; Melle, S; Garcia, AA; et al; Gust, D. 2006. Discrete magnetic microfluidics. *APPLIED PHYSICS LETTERS*. 89-3. ISSN 0003-6951.
- 10 **Scientific paper.** Melle, S; Calderon, OG; Rubio, MA; Fuller, GG. 2003. Microstructure evolution in magnetorheological suspensions governed by Mason number. *PHYSICAL REVIEW E*. 68-4. ISSN 1539-3755.

C.2. Conferences and meetings

- 1 M.A. Rubio. Interfacial Shear Rheology: Principles, Experimental Techniques and Some Applications. Reunión Nacional de Física Estadística, FisEs23. GEFENOL - RSEF. 2023. Spain. Participatory - invited/keynote talk. Conference.
- 2 A. Esteban; J. Tajuelo; P. Sánchez-Puga; M.A. Rubio; J. Hernández. On the Numerical Simulation of Interfacial Rheology. 2nd Spanish Fluid Mechanics Conference - SFMC23. 2023. Spain. Participatory - oral communication. Conference.
- 3 P. Sánchez-Puga; J. Tajuelo; J.M. Pastor; M.A. Rubio. Nonlinear interfacial strain profiles in the magnetic needle ISR and the constant strain operation modes. Annual European Rheology Conference. European Society of Rheology. 2022. Spain. Participatory - oral communication. Conference.
- 4 M.A. Rubio; P. Sánchez-Puga; J. Tajuelo; J.M. Pastor. Two-dimensional melting in untilted phases of fatty acid Langmuir monolayers: a thermo-rheological study. 12th Liquid Matter Conference. European Physical Society. 2021. Participatory - oral communication. Conference.
- 5 P. Sánchez-Puga; J. Tajuelo; J.M. Pastor; M.A. Rubio. Flow field-based data analysis for rotating microfabricated probes (the microbutton ISR). Annual European Rheology Conference. European Society of Rheology. 2021. Participatory - oral communication. Conference.
- 6 P. Sánchez-Puga; J. Tajuelo; Juan Manuel Pastor Ruiz; M.A. Rubio. Thermo-rheological studies of phase transitions in fatty acid Langmuir monolayers: Transitions to the LS phase. 18th International Congress on Rheology. International Comitee on Rheology. 2020. Brazil. Participatory - oral communication. Conference.
- 7 M.A. Rubio; J. Tajuelo; J.M. Pastor; P. Sánchez-Puga. Dynamic measurements with the bicone interfacial shear rheometer: Flow field based data processing.. 16th Conference of the International Association of Colloid and Interface Scientists. International Association of Colloid and Interface Scientists. 2018. Holland. Participatory - oral communication. Conference.

- 8 J. Tajuelo; J.M. Pastor; M.A. Rubio. The bicone interfacial shear rheometer revisited: Flow field based data processing for the oscillating conical bob. 12th Annual European Rheology Conference. The European Society of Rheology. 2018. Italy. Participatory - oral communication. Conference.
- 9 Javier Tajuelo Rodríguez; Eduardo Guzmán; Francisco Ortega; Ramón González Rubio; Miguel Ángel Rubio Álvarez. The unusual interfacial shear rheology of fatty acid/alcohol Langmuir monolayers. 11th Annual European Rheology Conference. European Society of Rheology. 2017. Denmark. Participatory - oral communication. Conference.
- 10 Javier Tajuelo Rodríguez; Juan Manuel Pastor Ruiz; Miguel Ángel Rubio Álvarez. A high sensitivity magnetic trap driven Interfacial Shear Rheometer. XVIIth International Congress on Rheology (ICR2016). 2016. Japan. Participatory - oral communication.

C.3. Research projects and contracts

- 1 **Project.** Teoría del Coarse-Graining y técnicas experimentales para sistemas biológicos multiescala. Ministerio de Ciencia e Innovación. Miguel Ángel Rubio Álvarez. (Universidad Nacional de Educación a Distancia). 01/09/2021-31/08/2024. 145.200 €. Principal investigador.
- 2 **Project.** Estructura y Dinámica Multiescala en Materia Blanda. Ministerio de Ciencia e Innovación. Investigación. José Español Garrigós. (Universidad Nacional de Educación a Distancia). 01/01/2017-31/12/2019. 54.450 €.
- 3 **Project.** Reología interfacial y estabilidad de películas delgadas fluidas. Ministerio de Ciencia e Innovación. Investigación. Miguel Ángel Rubio Álvarez. (Universidad Nacional de Educación a Distancia). 01/10/2017-30/09/2018. 10.000 €.
- 4 **Project.** Materia blanda y nanofluidos en múltiples escalas. Ministerio de Economía y Competitividad. Miguel Ángel Rubio Álvarez. (Universidad Nacional de Educación a Distancia). 01/01/2014-31/12/2017. 50.000 €.
- 5 **Project.** MICRO-REOLOGIA: Estructura y dinámica de sistemas coloidales confinados. Ministerio de Ciencia e Innovación. Miguel Angel Rubio Alvarez. (Universidad Nacional de Educación a Distancia). From 2009. 78.000 €. Co-ordinator.
- 6 **Project.** Estructura y dinámica de fluidos complejos: Problemas de volumen y de interfase.. M.E.C. (Ref. FIS2006-12281-C02-02). Miguel Angel Rubio Alvarez. (UNED, UCM,). From 2007. 64.000 €.
- 7 **Project.** Estructura y dinámica de fluidos complejos: fluidos magnetoreológicos y fluidos poliméricos. MINISTERIO DE EDUCACION Y CIENCIA. Miguel Angel Rubio Alvarez. (Universidad Nacional de Educación a Distancia). From 2005. 10.710 €. Co-ordinator.
- 8 **Contract.** Addendum Contract to Collaboration agreement by and between UNED and Biolin Scientific. Extension of the software programming period Miguel Ángel Rubio Álvarez. 16/02/2024-16/08/2024. 22.500 €.
- 9 **Contract.** Addendum Contract to Collaboration agreement by and between UNED and Biolin Scientific. Extension of the software programming period Miguel Ángel Rubio Álvarez. 16/08/2023-15/02/2024. 18.000 €.
- 10 **Contract.** Collaboration agreement by and between UNED and Biolin Scientific Miguel Ángel Rubio Álvarez. 15/02/2021-15/02/2036.

C.4. Activities of technology / knowledge transfer and results exploitation

- 1 Miguel Ángel Rubio Álvarez; Javier Tajuelo Rodríguez; Juan Manuel Pastor Ruiz. 16829899.0 - 1001 / 3330695. Magnetic needle interfacial shear rheometer and system and method for actuating same 09/09/2020. Universidad Nacional de Educación a Distancia.
- 2 Miguel Ángel Rubio Álvarez; Javier Tajuelo Rodríguez; Juan Manuel Pastor Ruiz. P201531113. Reómetro interfacial de cizalla por aguja magnética y sistema y método de accionamiento del mismo Spain. 01/12/2017. Universidad Nacional de Educación a Distancia, Universida Politécnica de Madrid.

Fecha del CVA	27/08/2024
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Parte A. DATOS PERSONALES

Nombre	Pablo		
Apellidos	Dominguez García		
Sexo		Fecha de Nacimiento	
DNI/NIE/Pasaporte			
URL Web			
Dirección Email	pdominguez@fisfun.uned.es		
Open Researcher and Contributor ID (ORCID)			

A.1. Situación profesional actual

Puesto	Profesor Titular de Universidad		
Fecha inicio	2024		
Organismo / Institución	Universidad Nacional de Educación a Distancia		
Departamento / Centro	Física Interdisciplinar / Facultad de Ciencias		
País	España	Teléfono	(0034) 91398 - 9345
Palabras clave	Física ed -- física educacional; Física cs -- sistemas complejos		

A.2. Situación profesional anterior (incluye interrupciones en la carrera investigadora - indicar meses totales, según texto convocatoria-)

Periodo	Puesto / Institución / País
2011 - 2024	Profesor Contratado Doctor / Universidad Nacional de Educación a Distancia
2010 -	Profesor Ayudante Doctor / Universidad Nacional de Educación a Distancia
2007 -	Ayudante / Universidad Nacional de Educación a Distancia

A.3. Formación académica

Grado/Master/Tesis	Universidad / País	Año
Programa Oficial de Doctorado en Física de Sistemas Complejos	Universidad Nacional de Educación a Distancia	2007
Licenciado en Física Especialidad Física Fundamental	Universidad Complutense de Madrid	2002

Parte B. RESUMEN DEL CV

Licenciado en Ciencias Físicas por la Universidad Complutense de Madrid con especialidad en Física Fundamental (2002) y doctor en Ciencias Físicas por la UNED (2007) con Premio Extraordinario de Doctorado de la Facultad de Ciencias de la UNED.

Investigador principal (IP) de un proyecto de investigación para grupos emergentes (UNED), segundo investigador principal (MINECO) y ha participado como investigador en otros 7 proyectos de investigación financiados con fondos públicos.

Evaluación positiva en los tramos solicitados de actividad investigadora (3) y docente (3). Ha realizado estancias de investigación en Arizona State University (ASU, EEUU) y en École Polytechnique Fédérale de Lausanne (EPFL, Suiza). Temas de investigación abordados: micro-estructura y propiedades de coloides magnéticos, microfluídica de gotas sobre superficies superhidrofóbicas, simulaciones de dinámica browniana, y microrreología con técnicas ópticas aplicada a fluidos complejos y biofluidos. Los resultados de esta labor investigadora se recogen en 25 publicaciones (2005-2023) en revistas internacionales de prestigio, en su mayoría como primer autor (17).

Parte C. LISTADO DE APORTACIONES MÁS RELEVANTES

C.1. Publicaciones más importantes en libros y revistas con “peer review” y conferencias

AC: Autor de correspondencia; (nº x / nº y): posición firma solicitante / total autores. Si aplica, indique el número de citas

- 1 **Artículo científico.** (1/1) P Domínguez-García (AC). 2020. Brownian Disks Lab: Simulating time-lapse microscopy experiments for exploring microrheology techniques and colloidal interactions. *Computer Physics Communications*. Elsevier. 252, pp.107123. ISSN 0010-4655. Google Scholar (1) <https://doi.org/10.1016/j.cpc.2019.107123>
- 2 **Artículo científico.** (1/4) P. Domínguez-García (AC); Giovanni Dieter; László Forró; Sylvia Jeney. 2020. Filamentous and step-like behavior of gelling coarse fibrin networks revealed by high-frequency microrheology. *Soft Matter*. ROYAL SOC CHEMISTRY. 16-17, pp.4234-4242. ISSN 1744-683X. Google Scholar (3) <https://doi.org/10.1039/c9sm02228g>
- 3 **Artículo científico.** (1/3) P. Domínguez-García (AC); László Forró; Sylvia Jeney. 2016. Interplay between optical, viscous, and elastic forces on an optically trapped Brownian particle immersed in a viscoelastic fluid. *Applied Physics Letters*. American Institute of Physics. 109-14, pp.143702. ISSN 0003-6951. Google Scholar (7) <https://doi.org/10.1063/1.4964405>
- 4 **Artículo científico.** (1/6) P. Domínguez-García (AC); Frédéric Cardinaux; Elena Bertseva; László Forró; Frank Scheffold; Sylvia Jeney. 2014. Accounting for inertia effects to access the high-frequency microrheology of viscoelastic fluids. *Physical Review E*. The American Physical Society. 90-060301(R). Google Scholar (19)
- 5 **Artículo científico.** (1/3) P. Domínguez-García (AC); J.M. Pastor; M.A. Rubio. 2011. Aggregation and disaggregation dynamics of sedimented and charged superparamagnetic micro-particles in water suspension. *European Physical Journal E*. EDP Sciences / Società Italiana di Fisica / Springer-Verlag 2011. 34-4. Google Scholar (30)
- 6 **Artículo científico.** (1/4) P Domínguez-García (AC); Sonia Melle; JM Pastor; M.A. Rubio. 2007. Scaling in the aggregation dynamics of a magnetorheological fluid. *Physical Review E*. The American Physical Society. 76-5. Google Academics (96)
- 7 **Artículo científico.** Ana Egatz-Gómez; Sonia Melle; A. A. García; et al; Devens Gust; (5/11) P Domínguez-García. 2006. Discrete magnetic microfluidics. *Applied Physics Letters*. American Institute of Physics. 89-3. Google Academics (108)
- 8 **Artículo científico.** (1/4) Pablo Domínguez-García (AC); Jose R. Pinto.; Sylvia Jeney; Ana Akrap. 2023. Micro-mechanical response and power-law exponents from the longitudinal fluctuations of F-actin solutions. *Soft Matter*. ROYAL SOC CHEMISTRY. 19-20, pp.3652-3660. ISSN 1744-683X. <https://doi.org/10.1039/D2SM01445A>
- 9 **Artículo científico.** (1/4) P Domínguez-García (AC); M. Pancorbo; F. Ortega; M.A. Rubio. 2018. JColloids: Image analysis for video-microscopy studies of colloidal suspensions. *Computer Physics Communications*. Elsevier. 231, pp.243-244. ISSN 0010-4655. Google Scholar (5) <https://doi.org/10.1016/j.cpc.2018.04.033>
- 10 **Artículo científico.** A. Butykai; (2/6) P Domínguez-García; F.M. Mor; R. Gaál; L. Forró; S. Jeney. 2017. PFMCal: Photonic force microscopy calibration extended for its application in high- frequency microrheology. *Computer Physics Communications*. Elsevier. 220, pp.507-508. ISSN 0010-4655. Google Scholar (3) <https://doi.org/10.1016/j.cpc.2017.07.019>
- 11 **Artículo científico.** Manuel Pancorbo Castro; Miguel Ángel Rubio Alvarez; (3/3) Pablo Domínguez García (AC). 2017. Brownian dynamics simulations to explore experimental microsphere diffusion with optical tweezers. *Procedia Computer Science*. Elsevier. 108, pp.166-174. ISSN 1877-0509. Google Scholar (6) <https://doi.org/10.1016/j.procs.2017.05.231>

- 12 Artículo científico.** A. Butykai; F.M. Mor; R. Gaál; (4/6) P Domínguez-García; L. Forró; S. Jeney. 2015. Calibration of optical tweezers with non-spherical probes via high-resolution detection of Brownian motion. *Computer Physics Communications*. Elsevier. 196, pp.599-610. Google Scholar (5)
- 13 Artículo científico.** (1/2) P Domínguez-García (AC); M. A. Rubio. 2013. Single and multi-particle passive microrheology of low-density fluids using sedimented microparticles. *Applied Physics Letters*. American Institute of Physics. 102-074101, pp.074101. ISSN 0003-6951. Google Scholar (9)
- 14 Artículo científico.** (1/4) Pablo Domínguez-García; Flavio Mor; László Forró; Sylvia Jeney. 2013. Exploiting the color of Brownian motion for high-frequency micro-rheology of Newtonian fluids. *Proc. SPIE, Optical Trapping and Optical Micromanipulation X*. SPIE. 8810-881015. Google Scholar (1)
- 15 Artículo científico.** (1/1) P Domínguez García (AC). 2012. Microrheological consequences of attractive colloid-colloid potentials in a two-dimensional Brownian fluid. *European Physical Journal E*. EDP Sciences / Società Italiana di Fisica / Springer-Verlag 2011. 35-73. Google Scholar (4)
- 16 Artículo científico.** (1/2) P Domínguez-García (AC); M.A. Rubio. 2010. Three-dimensional morphology of field-induced chain-like aggregates of superparamagnetic microparticles. *Colloids and Surfaces A- Physicochemical and Engineering Aspects*. Elsevier. 358-1-3, pp.21-27. Google Scholar (18)
- 17 Artículo científico.** (1/2) P Domínguez-García (AC); M.A. Rubio. 2009. JChainsAnalyser: an ImageJ-based stand-alone application for the study of magneto-rheological fluids. *Computer Physics Communications*. Elsevier. 180-10, pp.1956-1960. Google Scholar (13)
- 18 Artículo científico.** (1/3) P Domínguez-García (AC); Sonia Melle; M. A. Rubio. 2009. Morphology of anisotropic chains in a magneto-rheological fluid during aggregation and disaggregation processes. *Journal of Colloid and Interface Science*. Elsevier. 333-1, pp.221-229. Google Scholar (23)
- 19 Artículo científico.** (1/4) P. Domínguez-García (AC); J.M. Pastor; Sonia Melle; M.A. Rubio. 2009. Electrostatic and hydrodynamics effects in a sedimented magnetorheological suspension. *Physical Review E*. The American Physical Society. 80-2. Google Scholar (7)
- 20 Artículo científico.** John Schneider; Ana Egatz-Gómez; Sonia Melle; S. Lindsay; (5/8) P. Domínguez-García; M.A. Rubio; M. Márquez; Antonio A. García. 2008. Motion of viscous drops on superhydrophobic surfaces due to magnetic gradients. *Colloids and Surfaces A- Physicochemical and Engineering Aspects*. Elsevier. 323-1-3, pp.19-27. Google Scholar (37)
- 21 Artículo científico.** Ana Egatz-Gómez; J Schneider; P Aella; et al; Antonio A. García; (5/11) P Domínguez-García. 2007. Silicon nanowire and polyethylene superhydrophobic surfaces for discrete magnetic microfluidics. *Applied Surface Science*. Elsevier. 254-1, pp.330-334. Google Scholar (50)
- 22 Artículo científico.** Antonio A. García; Ana Egatz-Gómez; Solitaire A. Lindsay; et al; Joseph Wang; (4/15) P Domínguez-García. 2007. Magnetic movement of biological fluid droplets. *Journal of Magnetism and Magnetic Materials*. Elsevier. 311-1, pp.238-243. Google Scholar (72)
- 23 Artículo científico.** Ana Egatz-Gómez; Sonia Melle; A. A. García; et al; Devens Gust; (6/12) Miguel A. Rubio. 2006. Superhydrophobic Nanowire Surfaces for Drop Movement Using Magnetic Fields. 2006 NSTI Nanotechnology Conference and Trade Show - NSTI Nanotech 2006 Technical Proceedings. 2, pp.501-504. ISBN 0-9767985-7-3.
- 24 Artículo científico.** (1/4) P Domínguez-García; S Melle; OG Calderón; M.A. Rubio. 2005. Doublet dynamics of magnetizable particles under frequency modulated rotating fields. *Colloids and Surfaces A- Physicochemical and Engineering Aspects*. Elsevier. 270, pp.270-276. Google Scholar (23)
- 25 Capítulo de libro.** (1/2) P Domínguez García (AC); M.A. Rubio. 2011. Hydrodynamics on Charged Superparamagnetic Microparticles in Water Suspension: Effects of Low-Confinement Conditions and Electrostatics Interactions. *Hydrodynamics: Advanced Topics*. Intech. 14, pp.1-29. ISBN 978-953-307-596-9.

C.3. Proyectos o líneas de investigación

- 1 **Proyecto.** PID2020-117080RB-C54, Teoría del Coarse-Graining y técnicas experimentales para sistemas biológicos multiescala. Pep Espanyol. (Universidad Nacional de Educación a Distancia). 01/01/2021-31/12/2024. 50.000 €. Miembro de equipo.
- 2 **Proyecto.** FIS2017-86007-C3-X-UNED, Estructura y dinámica multiescala en materia blanda.. Pep Espanyol. (Universidad Nacional de Educación a Distancia). 01/01/2017-31/12/2020. 45.000 €. Miembro de equipo.
- 3 **Proyecto.** FIS2013-47350-C5-5-R, Materia blanda y nanofluidos en múltiples escalas. Miguel Ángel Rubio Álvarez. (Universidad Nacional de Educación a Distancia). 01/01/2014-31/12/2017. 60.500 €. Investigador principal. Segundo investigador principal.
- 4 **Proyecto.** Comportamiento Dinámico de Sistemas Físicos Complejos: Fluidos magnetoreológicos, fluidos poliméricos y convección en sistemas debilmente confinados. Miguel Ángel Rubio. (Universidad Nacional de Educación a Distancia). 28/12/2001-27/12/2004. 56.675,44 €.
- 5 **Proyecto.** Efectos de la estabilidad coloidal sobre los procesos de agregación en un fluido magneto-reológico.. Pablo Domínguez García. (Universidad Nacional de Educación a Distancia). Desde 01/06/2010. 4.000 €.
- 6 **Proyecto.** Microreología: Estructura y Dinámica de Sistemas Coloidales Confinados.. (Universidad Nacional de Educación a Distancia). Desde 31/12/2009.
- 7 **Proyecto.** Estructura y dinámica de Fluidos Complejos: problemas de volumen y de interfase. Miguel Ángel Rubio Álvarez. (Universidad Nacional de Educación a Distancia). Desde 01/10/2006. 65.340 €.
- 8 **Proyecto.** Fluidodinámica computacional lagrangiana. Mar Serrano Maestro. (Universidad Nacional de Educación a Distancia). Desde 04/09/2006. 4.000 €.
- 9 **Proyecto.** Estructura y dinámica de Fluidos Complejos: fluidos magneto-reológicos y fluidos poliméricos. Miguel Ángel Rubio Álvarez. (Universidad Nacional de Educación a Distancia). Desde 31/12/2005. 10.710 €.
- 10 **Proyecto.** Materiales nanoestructurados de base polimérica: Fenómenos de interfase en relación con sus propiedades y aplicaciones avanzados. Consorcio entre Grupos de Investigación de la Comunidad de Madrid. J Baselga. (Universidad Nacional de Educación a Distancia). Desde 2005. 56.450 €.

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

Part A. PERSONAL INFORMATION		CV date	2024, August 28 th
First name	Paloma		
Family name	Fernández Sánchez		
Gender (*)		Birth date (dd/mm/yyyy)	
DNI			
e-mail	arana@ucm.es	http://piloto.fis.ucm.es/paloma/	
Open Researcher and Contributor ID (ORCID) (*)	0000-0003-0780-803X		

(*) *Mandatory*

A.1. Current position

Position	Professor (CU)		
Initial date	November 2007		
Institution	Universidad Complutense		
Department/Center	Materials Physics	Faculty of Physics	
Country	Spain	Teleph. number	+34 913944550
Key words	Characterization of optoelectronic materials, defects, oxides, nanomaterials, semiconductors		

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

Period	Position/Institution/Country/Interruption cause
1986-1990	Ayudante/ U. Complutense/ Promotion to TU
1990-2007	Profesor Titular /U. Complutense/ Promotion to CU

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Lic. Physics	Complutense/ Spain	1985
PhD Physics	Complutense/ Spain	1989

(Include all the necessary rows)

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

I joined the Department of Materials Physics in 1986 as an assistant professor and since 2007 I am a professor in the knowledge area of Materials Science and Metallurgical Engineering.

Along my career I have worked in different materials, although during the last years I am focused on oxides for optoelectronics, photocatalysis and sensing.

I belong to the FINE-UCM research group, of which currently I am codirector.

Scientific contributions and leadership in this field

- I have published around 170 papers, more than 160 indexed. Of these, around 80% belong to Q1 of the corresponding area, and more than 90% to T1. My current index h is 27, with i10 of 86, and circa 3000 cites. I have made more than 160 contributions to national and international Congresses. Of the contributions made more than 50 have been oral communications and more than 20 guests or plenary.
- Throughout these years I have participated in a total of 16 national projects, 5 international projects (two of them personnel training networks) and 6 international cooperation projects.
- Chair of several international conferences (EUROMAT 2009 and 2021; FIMPART 2018; NANO2022)

Academic appointments and leadership in this field

- Academic Secretary of Departamento de Física de Materiales, January 1993 to June 2010.



- Representative of Departamento Física de Materiales in the Academic Commission (Facultad de Ciencias Físicas), November 2018 to July 2010
- Responsible for the Physics and Chemistry Section (Máster de Formación de Profesorado de E.S.O. y Bachillerato, Formación Profesional y Enseñanzas de Idiomas de la Universidad Complutense (since 2011)
- President of the Spanish Materials Society (January 2007-December 2016)
- Vicepresident of the Federation of European Materials Societies (FEMS) (2016-2017)
- President of the Federation of European Materials Societies (FEMS) (2018-2019)

Education and Outreach activities and leadership in this field

- Member of the Permanent Commission of the Projects ENCIENDE and ACIERTAS for the promotion of Science at School -Confederación de Sociedades Científicas de España (COSCE) since 2011.
- Responsible for Materials Education symposia in FEMS-EUROMAT editions since 2015
- Member of Advisory Board of International Materials Education Symposium (Granta & Cambridge University)
- Participation in Materials Week (SOCIEMAT-UPM) 2013 and 2014 Editions
- Leader of Complutense Team in AMASE (ERASMUS+ Project): Advanced Materials in Education (Budget 53204€ Period:2022-2024)
- Education and Outreach in Materials Science, SOCIEMAT 2019

Review work for evaluation agencies and international organizations

- Evaluator of the INTAS program of the European Union
- Member of the panel of experts of the Fundación Telefónica for the Nanotechnology group of the "We create the future" project
- Member of the panel of experts of the Ministry of Industry, Tourism and Trade through the OPTI Foundation for the "STUDY OF PROSPECTIVE ON THE INDUSTRIAL APPLICATIONS OF NANOTECHNOLOGIES IN SPAIN IN THE HORIZON 2020"
- Area Coordinator of the Evaluation Agency for the Quality of the University System of Castilla y León (Calls 2008 and 2009)
- Evaluation of projects in various calls of the ANEP and AVAP agencies
- Project evaluation for the Ministry of Science, Technology and Productive Innovation of the Argentine Republic
- Member of the ANECA Subcommittee for the elaboration of the MECES (Materials Engineering)
- Evaluation of Projects in the Call for aid for the promotion of scientific, technological and innovation culture (FECYT 2015)
- Member of the Materials Technology Panel (AVAP)

Young researchers training

I have supervised 8 Doctoral Theses (2 of them in progress), of which Manuel Herrera Zaldívar received the National Award of the UNAM (Mexico) and Belén Sotillo the Extraordinary Doctorate Award (UCM).

- Manuel Herrera Zaldívar is currently the leader of a research group at CICESE-UNAM (México)
- Ana I. Urbieto Quiroga is Assistant Professor (TU) at U. Complutense
- Belén Alemán Llorente is Head of R+D+i in Artificial Intelligence at 1millionbot
- Belén Sotillo Buzarra is Assistant (Ayudante Doctor) at U. Complutense
- Rocío Ariza García is postdoc at Leuven University (KUL)
- Fernando Pavón Martínez is Secondary School teacher



I have also directed (in the theme of the project) 5 Degree Thesis (Materials Engineering), 12 Degree Thesis (Physical Sciences) and 9 Master's Thesis (Applied Physics and Nanophysics). Some of them have got support for PhD studies in other institutions and others have got support to go on with PhD under my supervision (Dr. Belén Sotillo and Dr. Rocío Ariza; Micaela Rodríguez and Juan Francisco Ramos, PhD still in progress).

Part C. RELEVANT MERITS (sorted by typology)

C.1. Indexed papers (10 selected from the last 10 years)

1. **LTA zeolite particles functionalized with nanomagnetite for effective recovery of dysprosium from liquid solutions**; Lorena Alcaraz, Belen Sotillo, Carlos Iglesias, Félix A. López, Paloma Fernández, Claudia Belviso, Ana Urbieto; *Micro and mesoporous materials* 363 (2024)112843
2. **Effect of lithium codoping on structural, morphological and photocatalytic properties of Nd doped ZnO**; Adalyz Ferreiro, Gregorio Flores-Carrasco, Ana Urbieto, Paloma Fernández, M. E. Rabanal; *Ceramics International* 2023, 49 (21) 33513
3. **Selective Electrochemical Conversion of Carbon Dioxide to Formic Acid on Oxide-Derived Sn_xZn bimetallic Catalysts**; Jiwon Kim, Jae Yong Park, Jin Wook Lim, Won Seok cho, Kisoo Kim, Paloma Fernández and Jong-Lam Lee; *ACS Appl. Energy Mater.* 2022, 5, 11042–11051
4. **Fabrication and Characterization of ZnO: CuO composites for their application in sensing processes**; D.J. Ramos, B.Sotillo, A. Urbieto, P.Fernández; *IEEE Sensors Journal*, vol. 21, no. 3, pp. 2573-2580, 1 Feb.1, 2021
5. **Growth by thermal evaporation of organized ensembles of ZnO structures on femtosecond laser induced periodic structures on silicon**; B. Sotillo, J. Siegel, R. Ariza, J. Solis, P. Fernández; *Nanomaterials* 2020, 10(4), 731
6. **Influence of yttrium doping on the structural, morphological and optical properties of nanostructured ZnO thin films grown by spray pyrolysis**; O. Bazta, A. Urbieto, J. Piqueras, P. Fernández, M. Addou, J.J. Calvino, A.B. Hungría; *Ceramics International* 45 (6) (2019) 6842-6852
7. **Luminescence and gas sensing properties of ZnO obtained from the recycling of alkaline batteries**; Carlos Sardá, Germán Escalante, Irene García-Díaz, Félix A. López, Paloma Fernández; *Journal of Materials Science* DOI: 10.1007/s10853-017-1667-4
8. **Optical spectroscopy characterization of Cu doped ZnO nano- and microstructures grown by vapour-solid method**; S. Señorís, B. Sotillo, A. Urbieto and P. Fernández; *Journal of Alloys and Compounds*, DOI: 10.1016/j.jallcom.2016.06.088
9. **Light guiding and optical resonances in ZnS microstructures doped with Ga or In**; B. Sotillo, P. Fernández, and J. Piqueras; *Journal of Materials Chemistry C*, 3, 10981-10989, 2015; **Seleccionado por la revista como “Hot Paper”**
10. **Controlling plasma distributions as driving forces for ion migration during fs laser writing**; T.T. Fernandez, J. Siegel, J. del Hoyo, B. Sotillo, P. Fernández, and J. Solis; *J. Phys D: Appl. Phys.* **48** (2015) 155101; * **Selected for cover**

C.2. Congress, indicating the modality of their participation (invited conference, oral presentation, poster)

I have sent circa 250 contributions to national and international conferences, almost half as oral contributions, 25 invited and 2 plenaries. For this summary, considering the space restrictions, I only indicate my participation at conferences as organizer during the last ten years

- FEMS JUNIOR EUROMAT 2024 Conference Co-chair
- NANO2022: Conference chair
- Member of Scientific Committee de EUROMAT 2015, 2017, 2019, 2023
- EUROMAT 2013, Chair of the Managing Committee (Sevilla 2013) and Member of Scientific Committee



- EUROMAT 2021: Conference Chair
- EUROMAT Symposium organizer : 2015, 2017, 2019
- Member of the permanent committee TEAM (Collaboration Academics) and member of editorial board Materials and Devices edited by CA
- Member of Managing Committee CARIBMAT 2016, 2018 and 2023
- FIMPART 2017 Conference co-chair
- TEAM 2017 Conference co- chair
- Member of the Scientific Committee Congreso Iberoamericano de Materiales, Argentina 2014

And the international communications sent during the last year 2023 (Invited or Oral)

- E-MRS, Strasbourg, May 2023

Femtosecond laser processing of niobium oxide layers with improved electro-optical properties for environmental applications; B. Sotillo, R. Ariza, P. Fernández, J. Solis

- International Materials Education Symposium (IMES), Cambridge April 2023

Building the house of our dreams with Advanced Materials; A. Urbieto, P. Fernández Sánchez

- Chemical catalyst, Rome 2023

Effect of lithium co-doping on structural, morphological and photocatalytic properties of RE-doped ZnO; M.E. Rabanal, A. Ferreiro, A. Urbieto, P. Fernández

- Euromat 2023, Frankfurt September 2023

Environmental applications of nano- and microstructures of ZnO doped with Ni and Ag; G. Gómez-Muñoz, B. Sotillo, A. Urbieto, P. Fernández

Fast growth of Zr-ZrO₂ core-shell composites by Joule resistive heating; J.F. Ramos-Justicia, J.L. Ballester, A. Urbieto, P. Fernández

- Caribmat 2023, San Juan de Puerto Rico, Octubre 2023

Multifunctional metal oxide composites for sustainable and green Applications
P. Fernández (Invited)

Structural and Compositional Study of ZnO Nanowires Grown by Thermal Oxidation During Joule Heating. Comparison with Nanowires Grown by Vapor-Solid (VS) Method; Janghyun Jo, R.E Dunin-Borkowski, J.Piqueras, P. Fernández, A. Urbieto, B. Sotillo, W. Jaeger;

Fast growth of metal - metal oxide core-shell composites by Joule resistive heating; J.F. Ramos-Justicia, A.Urbieto, and P. Fernández

C.3. Projects (10 last years)

1. **Desarrollo de un hormigón neutro en emisiones de CO₂, que utiliza CO₂ gaseoso para la mineralización del hormigón fresco y 2D-Sílice Mesoporosa Dopada con Iones de Cobre para la absorción y almacenamiento de CO₂ durante su vida útil**
Budget: UCM: 115580€; MR: Paloma Fernández (CPP2022-009910)
2. **Óxidos metálicos para una economía circular y sostenible;**
Budget: 12000€; MR: Paloma Fernández Sánchez (Santander UCM PR87/19-22613)
3. **Caracterización de láminas delgadas de óxidos de niobio y óxidos de tántalo para aplicaciones de almacenamiento de energía (CLOE)**
Budget: 35000€; MR: Belén Sotillo Buzarra, (PR65/19-22464)
4. **Functional nanomaterials based on metal oxides: synthesis and optimization of their optical and electronic properties for energy applications and sensors**
Budget: 435600€; MR: Bianchi Méndez Martín and Ana I. Cremades Rodríguez (MAT2015-65274-R; 2016-2019)
5. **Physical properties of elongated semiconductor nanostructures of technological interest**
MCINN MAT 2009- 07882. Budget: 363000 €; Duration: 01/01/2010-31/12/2012; MR: Javier Piqueras de Noriega)
6. **Imagine: Materials Science at sub-angstrom resolution**
MCINN Consolider CSD 2009-00013. Budget: 496114 €; Duration: 17/12/2009-16/06/2016; Proyecto Consolider- MR: Javier Piqueras de Noriega