



Part A. PERSONAL INFORMATION

CV date 11/07/2022

First name	Pilar		
Family name	Ariza Moreno		
Gender (*)	female	Birth date (dd/mm/yyyy)	Not For Public Release
Social Security, Passport, ID number	Not For Public Release		
e-mail	mpariza@us.es		
URL Web	url_pilar.ariza.moreno		
Open Researcher and Contributor ID (ORCID) (*)	0000-0003-0266-0216		

(*) Mandatory

A.1. Current position

Position	Full Professor		
Initial date	08/03/2016		
Institution	Universidad de Sevilla		
Department/Center	Mecánica Medios Continuos y Teoría Estructuras		
Country	Spain	Teleph. number	+34 954487397
Key words	Nanomechanics, coupled problems, multiphysics, multiscale modeling, graphene, nanostructured materials		

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

Period	Position/Institution/Country/Interruption cause
2005 –	Visiting Associate, GARCIT, California Institute of Technology, USA
2019 – 2019	Secretary General of the Innovation, Economy, Research and Universities Regional Ministry, Government of Andalusia, Spain
2005 – 2016	Associate Professor, ETSI, Universidad de Sevilla, Spain
2004 – 2005	Assistant Professor, ETSI, Universidad de Sevilla, Spain
2003 – 2004	Visiting Associate in Aeronautics, GARCIT, California Institute of Technology, USA
2002 – 2003	Postdoctoral Scholar Research, GARCIT, California Institute of Technology, USA
2000 – 2002	Assistant Professor, ETSI, Universidad de Sevilla, Spain
1998 – 2000	Teaching Assistant, Dep. of Continuum Mechanics, Universidad de Sevilla, Spain

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD	Universidad de Sevilla/Spain	2002
Licensed	Universidad de Sevilla/Spain	1997

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

Pilar Ariza is full professor of Solid Mechanics and Structures and head of the Doctoral Program Mechanical Engineering and Industrial Organization at the University of Seville. Her main research fields are modeling and simulation of advanced materials and multiphysics phenomena at different scales, with applications including sustainable energy, hydrogen storage, electronic devices, and others. Since 2019 she oversees the research group TEP972 of PAIDI (Plan Andaluz de Investigación, Desarrollo e Innovación), which is an interdisciplinary group interested in the mechanics and physics of materials and structures. Supported by undergraduate and graduate students, the team use analytical, computational, and experimental techniques to describe, understand and optimize the multiscale nature of materials and their resulting performance.

After her PhD in 2002, she did postdoctoral research for the period of one year at the California Institute of Technology (Caltech), where she worked as visiting associate for a second year. During that stage she worked on the development of a discrete model of the mechanical behavior of crystalline materials at the atomistic level. In September 2004 she returned to Sevilla and started an independent

research activity focused on this area of work. Thus, she is first funded in 2006, through national and regional calls for proposals, both with an allocation for scientific staff. Her funding is maintained through other two projects in 2009, two projects in 2012, and two national projects in 2015 and in 2018. These funds have included *FPI* grants in each of them except the last one. Her team has also included two other *FPU* grants in regional (2008) and national (2009) calls. Over the years, she has broadened her area of research, and in 2019, within the TEP972 group, she initiates new investigations focused on the predictive characterization of nanostructured materials, including theoretical and practical approaches. In the last three years, she has been co-directing two projects financed with FEDER funds, where the main goal is the multi-scale reinforcement by combining graphene oxide nano-sheets and high-capacity steel fibers of very high-strength concretes, to obtain a technologically advanced material with optimum mechanical properties for its application in energy storage systems. In addition, she has obtained in 2017 funding within the program *Acciones de Dinamización* from MINECO to participate in the preparation of a proposal for the H2020 ITN program.

Since 2005, she holds a position as Visiting Associate in Aeronautics at the Graduate Aerospace Laboratories of the Caltech (USA). This has facilitated research stays at the Institute for an average of three months per year, which has in turn allowed her to maintain and expand a network of international collaborators.

She has held an official unipersonal management position as Secretary General of Universities, Research and Technology in the government of the Junta de Andalucía for a period of 100 days (2019). However, her management experience is more extensive, she is and has been responsible for teaching undergraduate, doctoral and master courses, and she has supervised 20 and 10 final projects for undergraduate and master students, respectively. To establish a new area of research at the University of Seville, in 2006 she founded the research group *Modeling and Simulation of Multiple Scale Mechanics*, as such she has been the only person responsible for obtaining funding and leading the research. In addition, she has also been the main organizer of three international symposia attended by speakers from four continents: 5th Int. Symposium on Defect and Material Mechanics (ISDMM2011), IUTAM Symposium on micromechanics of defects in solids (SMDS2014) and Euromech Colloquium Micromechanics of Defects in Crystalline Solids and Metals in 2018. She has secured external funding for these activities and acted as guest editor of special issues in the International Journal of Fracture for the ISDMM, and in Mechanics of Materials for the SMDS2014. She is member of three editorial boards: International Journal of Fracture, International Journal of Mechanical Sciences and International Journal of Numerical Methods for Calculation and Design in Engineering.

Since 2014 she is member of the IUTAM General Assembly and representative of Spain in IUTAM. She also serves as a member of the IUTAM Congress Committee. In 2018 she founded the Spanish scientific society *Sociedad Española de Mecánica Teórica y Aplicada* (SEMTA), which is adhered to IUTAM and Euromech, and has served as its president ever since. During 2021 she has chaired the IUTAM Diversity Working Group and has been elected General Treasurer of IUTAM and member of the IUTAM's Bureau. She has evaluated research projects since 2006, reviewed articles in indexed journals since 2004 and participated in several committees for the selection of candidates for pre- and postdoctoral fellowships.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications

- 1 Scientific paper.** Ariza, M. P.; Ortiz, M. (1/2). 2021. A semi-discrete line-free method of monopoles for dislocation dynamics. *Extreme Mechanics Letters*, 45, 101267.
- 2 Scientific paper.** Arca, F.; Mendez, J.P.; Ortiz, M.; Ariza, M.P. (AC) (4/4) 2020. Charge-carrier transmission across twins in graphene. *Journal of Physics: Condensed Matter*, 32(42):425003-425012.
- 3 Scientific paper.** Ríos, J.D.; Leiva, C.; Ariza, M.P.; Seitzl, S.; Cifuentes, H. (3/5) 2019. Analysis of the tensile fracture properties of ultra-high-strength fiber-reinforced concrete with different types of steel fibers by X-ray tomography. *Materials and Design*, 165: 107582.
- 4 Scientific paper.** Sun, X.; Ariza, M.P.; Ortiz, M.; Wang, K. (2/4) 2019. Atomistic modeling and analysis of hydride phase transformation in palladium nanoparticles. *Journal of the Mechanics and Physics of Solids*, 125, pp.360-383.

- 5 **Scientific paper.** Sun, X.; Ariza, M.P.; Ortiz, M.; Wang, K. (2/4) 2018. Long-Term Atomistic Simulation of Hydrogen Absorption in Palladium Nanocubes Using a Diffusive Molecular Dynamics Method. *International Journal of Hydrogen Energy*. 43(11):5657-5667.
- 6 **Scientific paper.** Ponga, M.; Ortiz, M.; Ariza, M.P. (AC) (3/3). 2017. A comparative study of nanovoid growth in FCC metals. *Philosophical Magazine*. 97: 2985-3007.
- 7 **Scientific paper.** Sun, X.; Ariza, M.P.; Ortiz, M.; Wang, K. (2/4) 2017. Acceleration of Diffusive Molecular Dynamics Simulations Through Mean Field Approximation and Subcycling Time Integration. *Journal of Computational Physics*. 350: 470-492.
- 8 **Scientific paper.** Ponga, M.; Ortiz, M.; Ariza, M. P. (AC) (3/3). 2015. Finite-temperature non-equilibrium quasi-continuum analysis of nanovoid growth in copper at low and high strain rates. *Mechanics of Materials*, 90, pp.253-267.
- 9 **Scientific paper.** Venturini, G.; Wang, K.; Romero, I.; Ariza, M. P.; Ortiz, M. (4/5). 2014. Atomistic long-term simulation of heat and mass transport. *Journal of the Mechanics and Physics of Solids*, 73, pp.242-268.
- 10 **Scientific paper.** Ariza, M. P.; Romero, I.; Ponga, M.; Ortiz, M. (AC) (1/4). 2012. HotQC simulation of nanovoid growth under tension in copper. *International Journal of Fracture*, 174(1), pp. 75-85.

C.2. Congress

- 1 M.P. Ariza; M. Ortiz. Size scaling of yield strength in copper thin layers undergoing simple shear: a discrete dislocation dynamics analysis by the method of monopoles (2021) 25th International Congress of Theoretical and Applied Mechanics (25th ICTAM 2020+1_Virtual), IUTAM, Milano, Italy. Invited talk.
- 2 M.P. Ariza. Dislocation accommodation mechanisms in monolayer and bilayer graphene (2020) Theory and Computation for 2D Materials, Institute for Pure & Applied Mathematics (IPAM), University of California Los Angeles, Los Angeles, USA. Plenary talk.
- 3 Pilar Ariza. Diffusive Molecular Dynamics for Hydrogen Diffusion Applications (2019) Seminars of the NTNU Nanomechanical Lab at Department of Structural Engineering, Norwegian University of Science and Technology (NTNU), Trondheim, Norway. Invited seminar.
- 4 M. Ortiz; M.P. Ariza; X. Sun; K.G. Wang. Atomistic Simulation of hydrogen storage in Pd nanoparticles (2019) USACM Workshop on Mechanics of Nanoscale Materials, University of Pennsylvania, Philadelphia (USA). Invited talk.
- 5 M.P. Ariza; X. Sun; M. Ortiz. Deformation-diffusion coupled computational model for hydrogen diffusion in nanomaterials (2018) IUTAM Symposium on Size-effect in Microstructure and Damage Evolution, DTU, Copenhagen, Denmark. Invited talk.
- 6 M.P. Ariza. Long-Term Atomistic Simulation of Hydrogen Diffusion in Nanomaterials using a Diffusive Molecular Dynamics Method (2018) Seminars in Mechanics and Materials, Mechanical and Aerospace Engineering, University of California San Diego, California, USA. Invited seminar.
- 7 M.P. Ariza; M. Ortiz; X. Sun; K.G. Wang. Deformation-diffusion coupled computational model for hydrogen diffusion in nanomaterials (2018) Variational Methods for the Modelling of Inelastic Solids, Mathematisches Forschungsinstitut Oberwolfach, Oberwolfach, Germany. Plenary talk.
- 8 M.P. Ariza; M. Ortiz. 2D Materials (2017) Working Group on Multiscale Strategies. Multiscale Mathematics and Computing in Science and Engineering. Institute for Mathematics and its Applications (IMA), University of Minnesota, Minneapolis, USA. Plenary talk.
- 9 M.P. Ariza; J.P. Mendez. Engineered graphene based devices (2014) IUTAM Symposium on innovative numerical approaches for materials and structures in multi-field and multiscale problems. Burg Schnellenberg (Germany).
- 10 M.P. Ariza; M. Ponga; M. Ortiz. Thermomechanical growth of nanovoids in fcc single crystals (2013) 50th Annual Technical Meeting of the Society of Engineering Science (SES 2013). Brown University, Providence (USA). Invited talk.

C.3. Research projects

- 1 **Project.** Refuerzo multiescala de hormigones de muy alta resistencia mediante la combinación de nano-láminas de óxido de grafeno y fibras de acero de alta capacidad. PAIDI 2020: Acciones complementarias I+D+i (Junta de Andalucía (Consejería de Economía y Conocimiento)). Co-PIs: Cifuentes Bulté, Héctor; Ariza Moreno, Pilar. Under evaluation.

- 2 **Project.** P18-RT-1485: Estudio de materiales reforzados con grafeno para su aplicación en sistemas de almacenamiento de energía (REINSTOMAT). PAIDI 2020: Proyectos I+D+i (Junta de Andalucía (Consejería de Economía y Conocimiento)). Co-PIs: Ariza Moreno, Pilar; Cifuentes Bulté, Héctor. 01/01/2020-31/12/2022. 122.968 €.
- 3 **Project.** US-1266248: Análisis multiescala del comportamiento a altas temperaturas de materiales de base cementante reforzados con grafeno (CemGrpHot). Proyectos I+D+i FEDER Andalucía 2014-2020 (Junta de Andalucía (Consejería de Economía y Conocimiento)). Co-PIs: Cifuentes Bulté, Héctor; Ariza Moreno, Pilar. 01/02/2020-30/04/2022. 86.800 €.
- 4 **Project.** RTI2018-094325-B-I00: Plataforma Computacional para el Diseño Integrado de Materiales de Altas Prestaciones para la Industria de las Energías Limpias. Plan Estatal 2017-2020 Retos - Proyectos I+D+i (Ministerio de Ciencia, Innovación y Universidades). PI: Ariza Moreno, Pilar. 01/01/2019-31/12/2021. 48400 €.
- 5 **Project.** EUIN2017-86279: Análisis multiescala y optimización de MATeriales con propiedades eXtremas y sometidos a condiciones multifísicas eXtremas Ministerio de Economía, Industria y Competitividad. PI: Ariza Moreno, Pilar. 01/09/2017-30/12/2018. 24.000 €.
- 6 **Project.** DPI2015-66534-R: Desarrollo de Herramientas Computacionales para el Diseño de Materiales para Aplicaciones de Almacenamiento Eficiente de Energía. Plan Estatal 2013-2016 Retos - Proyectos I+D+i (Ministerio de Economía y Competitividad). PI: Ariza Moreno, Pilar. 01/01/2016-31/12/2019. 187.550 €.
- 7 **Project.** P12-TEP-850: Estudio de la Estabilidad Termoelectrodinámica de Defectos en Grafeno: Métodos Computacionales y Aplicaciones a Nanocomponentes y Biosensores. Proyectos de Excelencia de la Junta de Andalucía 2012 (Consejería de Economía, Innovación y Ciencia). PI: Ariza Moreno, Pilar. 30/01/2014-18/07/2019. 188.184 €.
- 8 **Project.** DPI2012-32508: Modelos Multiescala de la Termodinámica de Defectos Discretos y sus Interacciones en Materiales Metálicos y sus Aleaciones Sometidos a Altas Temperaturas y Ambientes Corrosivo. Plan Nacional del 2012 (Ministerio de Economía y Competitividad). PI: Ariza Moreno, Pilar. 01/01/2013-31/12/2015. 58.500 €.
- 9 **Project.** DPI2011-12828-E: Red Temática sobre Modelado y Simulación en Mecánica y Materiales. OPN - Acción Complementaria (Ministerio de Ciencia e Innovación). PI: Ariza Moreno, Pilar. 01/01/2012-31/12/2013. 22000 €.
- 10 **Project.** DPI2009-14305-C02-01: Estudio multiescala de la plasticidad en cristales. Un modelo rápido de dinámica de dislocaciones. Plan Nacional del 2009 (Ministerio de Ciencia e Innovación). PI: Ariza Moreno, Pilar. 01/01/2010-30/06/2013. 75.988 €.

C.4. Contracts, technological or transfer merits

- 1 **Contract.** Análisis Numérico y Experimental de Estructuras de Colectores Solares (PI-2069/11/2021) Next Force Engineering, S.L. PI: Cifuentes Bulté, Héctor. 01/02/2021-30/09/2021. 15.000 €. Investigador.
- 2 **Contract.** Estudio numérico y experimental del comportamiento de placas de cubierta de policarbonato (PI-1831/11/2018) Polímeros Gestión Industrial S.L. PI: Cifuentes Bulté, Héctor. 18/07/2018- 17/07/2020. 40.000 €. Investigador.
- 3 **Contract.** Informe técnico de aeronaves con fuselaje de materiales compuestos (ES-0982/2012) Costruzioni Aeronautiche TECNAM S.r.l.. PI: Ariza Moreno, Pilar. 01/06/2012- 31/07/2012. 3.500 €.
- 4 **Contract.** Estudio de Cargas de Viento en Colectores Solares (ES-0578/2010) Abengoa Solar España S.A. PI: Ariza Moreno, Pilar. 01/05/2010- 31/12/2011. 5.000 €.