MINISTERIO DE CIENCIA E INNOVACIÓN

Cofinanciado por la Unión Europea

AGENCIA ESTATAL DE INVESTIGACIÓN

CURRICULUM VITAE (CVA)

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

CV date	07/09/2022

Part A. PERSONAL INFORMATION

First name	Mª Cristina		
Family name	Rodríguez González		
Gender (*)	Female	Birth date (dd/mm/yyyy)	
ID number			
e-mail		URL Web	
Open Researcher and Contributor ID (ORCID) (*)		0000-0003-1130-9591	

(*) Mandatory

A.1. Current position

Position	Full Professor		
Initial date	30/11/2011		
Institution	University of Oviedo		
Department/Center	Construction and Manufacturing Engineering		
Country	Spain	Teleph. number	0034 985181951
Key words	Mechanical behaviour, fracture, fatigue, welded joints, structural integrity		

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

Period	Position/Institution/Country/Interruption cause
2002-2011	Titular de Universidad (Senior Lecturer)

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
Industrial Engineering	University of Oviedo / Spain	1989
PhD in Industrial Engineering	University of Oviedo / Spain	1992

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

Industrial Engineer since 1989, PhD in mechanical engineering in 1992. Research career started as **head** of setting up the mechanical testing Laboratory and of the area of "fracture mechanics and fatigue" at the Instituto Tecnológico de Materiales de Asturias (ITMA), which developes R&D and transfers technologies to the industrial sector (1992-1996). We was awarded with the **Premio** "**Mieres del Camino" for the best applied research in 1994**.
Since 1996 professor at the Universidad de Oviedo, promoted to **full professor** in 2011. Participation in **31 R&D** competitive projects (**15 as IP**) and in more than 50 transfer contracts (**30 as IP**), obtaining **total funding of almost 2.0 million euros,** destined to the hiring of young researchers (**10 PhD directed in the last 10 years**) and in the acquisition and maintenance of scientific equipment (RX diffractometer, LECO hydrogen analyser, RUMUL resonant fatigue testing machine, etc).
With and **h-index=21**, I have more than **300 publications in peer-review** journals (**82 JCR/ 50 Q1**) and I have participated in more than **200 scientific conferences**, five of them as invited speaker.
After almost 30 years of dedication to the analysis and simulation of the mechanical behaviour of materials and components, especially in the field of fracture and fatigue, I consider **my greatest scientific contributions revolve around the design and development of testing methodologies** to simulate the real work conditions of mechanical components. I am the author of the design and development of various test devices that are currently being used in

several national and international universities (Small Punch Test devices, SPT), and **I am co-author of one of the most cited articles in this subject [2] (160 citations)**. I have also been responsible for the dissemination of the SP test, developing methodologies to use it in the characterization of welded steel joints (10.1111/J.1365-2141.2009.07916.X,78 cites), polymers(10.1016/J.POLYMERTESTING.2013.10.013, 22 citations), and ceramics (10.1016/J.JEURCERAMSOC.2019.06.019, 8 citations).
In the last 8 years I have focussed my research work on the problem of **hydrogen embrittlement in steels**, developing testing procedures to analyse this phenomenon in welded steel structures (10.1016/J.MSEA.2014.12.083, 35 citations). Based on this subject, I have coordinated two nationally funded R&D projects (**see C.3**) and I am co-author of more than 20 highly cited articles (some of them **in the next section**).
I am a member of the SIMUMECAMAT consolidated research group (www.simumecamat.com) and of the Instituto Universitario de Tecnología Industrial de Asturias (www.iuta.es), which has more than 150 researchers and in which I have been **Vice-chair** (2002-2008) and **Chair (2008-2012)**. In the University of Oviedo, I was a **member of the Publications Committee** (2012-2014) and **Coordinator of the PhD Program in "Design, Construction and Manufacturing in Engineering" (**2011-2016). From January 2022 until now I am a **member of the Doctoral Commission** and of the **Claims commission of Uniovi**.
My contribution to innovation and technological development includes support of the industry both through transfer contracts (**more than 50**) and through the **organization of more than 20 scientific-technical meetings** between University and industry with the cooperation of the Parque Científico y Tecnológico de Gijón in the frame of the "**Desayunos Tecnológicos**". I am a f**ounding member of a university spin-off** (http://khisgroup.com/) created with two young researchers whose PhD theses I directed.
Training young researchers is another of my great interests, having directed **10 PhD theses in the last 10 years**. Six of these were developed through competitive founding programs (**2 national FPI and 4 regional Severo Ochoa**). The other four were developed in transfer projects with companies with students working in the framework of those companies.
Our internationalization effort includes the development of research work with the most prestigious Universities, such as the Imperial College of London (Emilio M. Pañeda), the Politecnico di Milano (Prof. Laura Vergani) and the University of California in Santa Barbara (Prof. John Hancock).
I am a **regular reviewer of research projects (ANEP** and regional evaluation agencies) and **JCR scientific journals**. I am a **member of the ANECA C10 Committee** in Mechanical Engineering (2011/2021). Since 2016 I have been **vice-president of the Grupo Español de Fractura** (www.gef.es), which awarded me with the **honorary medal in 2015**. I have also been **named honorary distinguished guest** of the National University of Trujillo (Perú) in 2002 and 2008.
Finally, I have **4 research stretch**es (1994-1999, 2000-2005, 2006-2011, 2012-2017) and **1 transfer to industry stretch** (1992-2011). I have the honour of being appointed a **full member of the** newly constituted **Academia Asturiana de Ciencia e Ingeniería,** http://www.aaci.es. (Nov 2021).

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

C.1. Publications *(Papers)*

[1] C. Rodríguez; E. Cárdenas; F. J. Belzunce; C. Betegón. 2013. Fracture Characterization of Steels by Means of the Small Punch Test. Experimental Mechanics, 53 (3): 385-392. 10.1007/S11340-012-9637-X. Times Cited: 27

[2] T.E. García, C. Rodríguez, F.J. Belzunce y C. Suárez. 2014. Estimation of the mechanical properties of metallic materials by means of the small punch test. Journal of Alloys and Compounds, 582, 708-717 (Q1). 10.1016/J.JALLCOM.2013.08.009. Times Cited: 200

[3] P.P. Sanjurjo, C. Rodríguez, I. Peñuelas, T.E. García, F.J. Belzunce.2014. Influence of the target material constitutive model on the numerical simulation of a shot peening process. Surf & Coat Tech, 258, 822-831. 10.1016/J.SURFCOAT.2014.07.075 Cites: 50

[4] T.E. García, C. Rodríguez, F.J. Belzunce I. Peñuelas, B. Arroyo. 2015. Development of a methodology to study the hydrogen embrittlement of steels by means of the small punch

test Materials Science & Engineering A, 626 342–351. 10.1016/J.MSEA.2014.12.083. Times Cited:41

[5] E. Martínez Pañeda, T.E. García, C. Rodríguez. 2016. Fracture toughness characterization through notched small punch test specimens. Materials Science & Engineering A, 422–430. 10.1016/J.MSEA.2016.01.077. Times Cited: 40

[6] T.E. García, C. Rodríguez, F.J. Belzunce, I.I. Cuesta. 2016. Effect of hydrogen embrittlement on the tensile properties of CrMoV steels by means of the small punch test. Mat. Science & Eng A 664: 165–176. 10.1016/J.MSEA.2016.03.134. Times Cited: 27

[7] L. B. Peral, A. Zafra, S. Blasón, C. Rodriguez, FJ. Belzunce, 2019. Effect of hydrogen on the fracture toughness of CrMo and CrMoV steels quenched and tempered at different temperatures. International Journal of hydrogen energy. 43; 9068–9082 10.1016/J.IJHYDENE.2018.03.158 Times Cited:27

[8] G. Álvarez, C. Rodríguez, T.E. García, F.J. Belzunce. 2019. Hydrogen embrittlement of structural steels: Effect of the displacement rate on the fracture toughness of high-pressure hydrogen pre-charged samples. International Journal of Hydrogen Energy, 44:15634-15643 10.1016/J.IJHYDENE.2019.03.279. Times Cited:27

[9] A. Zafra, L.B. Peral, J. Belzunce, C. Rodríguez. Effects of hydrogen on the fracture toughness of 42CrMo4 steel quenched and tempered at different temperatures. 2019. *International Journal of Pressure Vessels and Piping 171, 34–50.* 10.1016/j.ijpvp.2019.01.020. Times Cited: 19

[10] G. Álvarez, A. Zafra, F.J. Belzunce, C. Rodríguez. 2020. Hydrogen embrittlement analysis in a CrMoV steel by means of SENT specimens. Theoretical and Applied Fracture Mechanics. 106: 102450. 10.1016/J.TAFMEC.2019.102450. Times Cited: 11

C.2. Congress

- **Organizer** of the XXVII (2011) and XXXVII (2021) Meeting of the Spanish Group of Fracture
- Virtual Eurocorr 2021 **Hydrogen diffusion and trapping** in 42CrMo4 quenched and tempered steel: influence of quenching temperature and plastic deformations. A. Zafra, F.J. Belzunce, C. Rodríguez. Oral present.
- 1st Virtual Iberian Conference on Structural Integrity. Determination of the **hydrogen embrittlement** index in a CrMoV weld by means of Small Punch Test. G. Álvarez, C. Rodríguez, J. Belzunce. Anales de Mecánica de la fractura 37 (2020) 2015-220. Oral
- V Coloquio Iberoamericano de Fractura y Fatiga, CONAMET-SAM. Análisis de la **fragilización por hidrógeno** en aceros. A. Zafra, L.B. Peral**, J. Belzunce** y C. Rodríguez. Valdivia, Chile, noviembre de 2019. **Invited Presentation**.
- EUROMAT 2019. Study of **hydrogen diffusion** and trapping in 42CrMo4 quenched and tempered steel. A. Zafra, J. Belzunce, C. Rodríguez e I. Fernández-Pariente. Stocolm, Sweden, Sep. 2019. Oral Presentation.
- FATIGUE 2018, **Effect of hydrogen** on fatigue crack growth of quenched and tempered CrMo(V) steels. L.B. Peral, S. Blasón, A. Zafra, C. Rodríguez, y J. Belzunce. ENSMA, Poitiers, May 2018. Meeting Proceedings. Oral presentation.
- **3th Int.Conf. on Metals & Hydrogen**. Effect of hydrogen in the tensile properties of 42CrMo4 steel quenched and tempered at different temperatures. A. Zafra, L.B. Peral, C. Rodríguez, y J. Belzunce. Ghent, Bélgica, Mayo 2018. Proc. of. Conf. on Metals & Hydrogen, 3 (2018), P16. Oral presentation
- 2nd Int. Conf. on Struct. Integrity, ICSI 2017. Evaluation of Strength and Fracture Toughness of Ferritic High Strength Steels Under **Hydrogen Environments**. B. Peral, A. Zafra, C. Rodríguez, J. Belzunce. Procedia Structural Integrity 5 (2017) 1275–1282. Funchal, Madeira, Portugal, Sep 2017. Oral presentation

- VI Congreso International de Materiales (CONIMAT 2014). Análisis del comportamiento mecánico de materiales utilizando el ensayo miniature de punzonado: Small Punch Test (SPT). **C. Rodríguez** and F.J. Belzunce. Trujillo, Perú, Nov. 2014. **Invited Presentation**.

C.3. Research projects

- *MICIN (PID2021-124768OB-C22)*. Comportamiento mecánico de aceros estructurales bajo carga de hidrogeno in-situ. Spanish National Funding (DGICYT). IP: **C. Rodríguez** University of Oviedo. September 2022- September 2025. Funding: 169.400 €.
- *FICYT (AYUD/2021/57532) (I+D+i en RED)*. Utilización de nuevas metodologías en la caracterización mecánica de piezas complejas obtenidas mediante pulvimetalurgia. Technological and Scientific Research Fundation (FICYT). IP: **C. Rodríguez** University of Oviedo. December 2021- November 2023. Funding: 108.517 €.
- *RTI2018-096070-B-C31*. Influencia del hidrogeno en el comportamiento a fractura y fatiga de uniones soldadas de aceros estructurales para aplicaciones energéticas. Spanish National Funding (DGICYT). IP: **C. Rodríguez** University of Oviedo. January 2018-Dicember 2021. Funding: 112.000 €.
- *MAT2014-58738-C3-1-R*. Hydrogen effect on fatigue and fracture toughness of medium and high strength steels used in the transport and storage of pressurized hydrogen. Spanish National Funding (DGICYT). IP: **C. Rodríguez**. University of Oviedo. January 2015-September 2018. Funding: 140.000 €.
- *MAT2011-28796-C03-03*. Evaluation of the structural integrity of pipeline steels and their welded joints with acid gas presence. Spanish National Funding (DGICYT). IP: **C. Rodríguez**. University of Oviedo. 2012-2015. Funding: 70.248 €
- *PEST08-16*. New materials and processes for the manufacture of reactors to ensure the supply of petroleum fuels. Asturian Regional funding (FICYT). IP: **C. Rodríguez** and Alfonso Fernández Canteli. University of Oviedo. 2009-2011. Funding: 672.000 €

C.4. Contracts, technological or transfer merits

Contracts (As Main Researcher in the last 10 years):

- Advanced characterization and structural integrity of complex structural elements. Company: KHIS group, S.L. 200.000 € (2016-2022). IP: F.J Belzunce and **C. Rodriguez**
- Asistencia técnica en el área de materiales. Company: PMG POWERTRAIN R&D CENTER, S.L. 50.000 € (15/07/2020 a 14/07/2023). IP: **C. Rodriguez**
- Research in new proccess and microalloyed steels for hot forging of automobile crankshafts. Company: CIE GALFOR S.A.U. (2014-2015). CDTI funding (Programa INTERCONECTA). 50.000 €. IP: **C. Rodriguez**
- Research in global thermal and superficial treatments for the prolongation of in-service life of tools subjected to high wear for use in hot forging of crankshafts. CIE GALFOR S.A.U. (2012-2014). CDTI funding: 64.900 €. IP: F.J Belzunce and **C. Rodriguez**
- I have participated as main researcher of researcher in more than **other 30 transfer contracts**

Technological or transfer merits

- Founding Member of a Spin-off company (Khis group, S.L) http://khisgroup.com/
- Head of IUTA (Instituto Universitario de Tecnología Industrial de Asturias) (2004-2012), coordinating 150 researchers from different technological areas.
- Organization of more than 20 Technological Meetings in the frame of the “Desayunos Tecnologicos” in cooperation with the Parque Científico y Tecnológico de Gijón.