CV Date	08/06/2025

Part A. PERSONAL INFORMATION

First Name	Julián		
Family Name	González Ayala		
Sex	Male	Date of Birth	16/02/1985
ID number Social Security, Passport	17621494K		
URL Web	https://produccioncientifica.usal.es/investigadores/148057/detalle		
Email Address	jgonzalezayala@usal.es		
Open Researcher and Contributor ID (ORCID)	0000-0002-2896-7542		

A.1. Current position

Job Title	Prof. Ayudante Doctor		
Starting date	2023		
Institution	University of Salamanca		
Department / Centre			
Country	Spain	Phone Number	(0034) 677565477 - 6334
Keywords			

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

Period	Job Title / Name of Employer / Country
2022 - 2023	Investigador / Universidad de Salamanca
2020 - 2022	Investigador / Universidad de Salamanca / Spain
2019 - 2019	Profesor Asociado / Universidad de Salamanca
2018 - 2019	Investigador / Universidad de Salamanca
2016 - 2017	Postdoc / CONACyT-México / Spain
2015 - 2016	Postdoc / CONACyT-México / Spain
2015 - 2015	Profesor de asignatura "A" interino / Universidad Nacional Autónoma de Mexico UNAM / Mexico

A.3. Education

Degree/Master/PhD	University / Country	Year
Doctorate in Physicomathematical Sciences	National Polytechnic Institute (IPN-México) / Mexico	2014
Master of Physicomathematical Sciences	National Polytechnic Institute (IPN-México) / Mexico	2010
Degree in Physics and Mathematics	National Polytechnic Institute (IPN-México) / Mexico	2009

Part B. CV SUMMARY

Formation: My bachelor, master and doctorate (with Honorific Mention) degrees were in physics and mathematics. Focused on thermodynamics and statistical physics. **Research topics:** My research involves the areas of thermodynamics, multi-objective and multiparametric optimization, power plants, thermal energy storage, complex systems, statistical physics, and fluid dynamics applied to heat transfer in porous media.

Research groups: I am a researcher in the following groups:

· Energy optimization, thermodynamics, and statistical physics (GTFE) at the Applied Physics Department in the Science Faculty of Salamanca University.

· Tecnología de la Información para la Digitalización Inteligente de Objetos y Procesos (TIDOP) at the Higher Polytechnic School of Ávila of Salamanca University.

Member of:

· Instituto de Física Fundamental y Matemáticas (IFFyM) de la USAL.

· Investigador Nacional Nivel I del Sistema Nacional de Investigadores del CONACyT-México.

Participation in research projects

· Evaluación de sistemas de almacenamiento térmico aplicados a condiciones locales para el aprovechamiento eficiente de fuentes renovables.

· European projects (research team): ¨Tecnologías Inteligentes Avanzadas para la transición Energética Sostenible¨ IA4TES del Programa Misiones de I+D en Inteligencia Artificial 2021

· Sistemas de refrigeración pasivo para páneles fotovoltaicos flotantes.

· Recently, I participated in the project “PHES: Almacenamiento de energía eléctrica con bombas de calor y su impacto en la matriz energética nacional” a National Project funded by ANII-Uruguay. Other previous projects include:

· National projects (IP):2 (Postdoc CONACyT-México)

· Local projects (IP):1 (Programa II-USAL)

· Regional projects (research team):1 (Desafío Universidad-Empresa)

· Local projects (research team):10 (Programa XI-USAL, TCUE (3), IPN-México (6))

Merits in scientific production: 40 papers in scientific journals, 36 are research papers (23 in first decile journals, 31 in first quartile according to Scopus) and 4 are related to Physics Education.

· My H index is 14 (Scopus, 15 in Google Scholar)

· Accreditation of Junta de Castilla y León for "Profesor Contratado Doctor", "Profesor Ayudante Doctor" and "Profesor de Universidad".

· Winner of the Entropy Travel Award in 2019,

· Winner of the prize to the best oral communication at the conference Entropy 2021: The Scientific Tool of the 21st Century.

· Finalist at the Illya Prigogine Prize of Thermodynamics 2015 for the best doctorate thesis, given by the Center for Advances Studies in Thermodynamics in the Joint European Thermodynamics Conference.· Award to the best doctorate thesis in the area of exact sciences by National Polytechnic Institute-Mexico

· Some of the articles have received mediatic coverage, including press releases, one interview in Canal 11-Mexico, and some mentions in scientific dissemination sites, such as, Phys.org, Finland Astrophysical Journal Tähdet ja avaruus, abc.es and some more in local media sites (local tv and newspapers).

· One of the articles was included in the Highlight Papers of 2016 in Europhysics Letters.

· Winner of the best postgraduate academic performance 2013-2014 in the Ph.D. program in Physical-mathematical Sciences awarded by the National Polytechnic Institute, Mexico.

· Honorable Mention for the best Master's thesis in Thermodynamics award at a national level, granted by the Mexican Thermodynamics Society (2011).

· Recognition for the best postgraduate academic performance 2009-2010 in the Master's program in Physical-mathematical Sciences, awarded by the National Polytechnic Institute, Mexico.

· Best undergraduate thesis award in the area of thermodynamics presented during 2009, awarded by the Mexican Thermodynamics Society.

Reviewer in scientific journals: I have made 121 reviews in the last 7 years for 25 different journals (the top 1% of the researchers with more reviews according to Web of Science).

Editorial activities: I’m an Editor of Frontiers of Physics, in Genetics, and Physiology.

Collaborations with research groups. During the 5 postdocs stays I’ve created collaborations with research groups outside the University of Salamanca, which include: Research groups in thermodynamics and complex systems in Mexico (Instituto Politécnico Nacional, CINVESTAV, UAM), Groups in China (Fuzhou, Xiamen, and Shenzhen Universities), in Uruguay (U. de la República).

Conferences: I have participated in 36 conferences from which 14 have been international and I’ve been invited to give the opening plenary talk for the XXXIV Congreso Nacional de Termodinámica – México.

Knowledge Transfer:
Doctorate thesis: 1. Master thesis: 1. TFM: 2. TFG: 4.

Part C. RELEVANT ACCOMPLISHMENTS

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

AC: corresponding author. (nº x / nº y): position / total authors. If applicable, indicate the number of citations

1 **Scientific paper**. Bo Chen; (2/6) J. Gonzalez-Ayala; A. Calvo Hernández; H. Yang; Rongxiang Luo; J. Guo. 2023. A novel electrochemical system with adiabatic pre-charging and pre-discharging processes for efficient refrigeration. Energy Conversion and Management. PERGAMON-ELSEVIER SCIENCE LTD. 293-117518, pp.1-11. ISSN 0196-8904. https://doi.org/10.1016/j.enconman.2023.117518

2 **Scientific paper**. Wanli Peng; (2/5) Julian Gonzalez Ayala; Juncheng Guo; Jucan Dong; Qi Qin. 2023. A two-stage sodium converter coupled to a two-stage TEG: Parametric optimization. Applied Thermal Engineering. ScienceDirect. 229-120560, pp.1-10. https://doi.org/10.1016/j.applthermaleng.2023.120560

3 **Scientific paper**. D Salomone-González; P. L. Curto-Risso; A. Calvo Hernández; J. M. M. Roco; A. Medina; (6/6) J. Gonzalez-Ayala (AC). 2022. Pumped heat energy storage with liquid media: Thermodynamic assessment by a transcritical Rankine-like model. Journal of Energy Storage. PERGAMON-ELSEVIER SCIENCE LTD. 56-105966, pp.1-14. ISSN 2352-152X. https://doi.org/10.1016/j.est.2021.103242

4 **Scientific paper**. (1/6) J. Gonzalez-Ayala (AC); D Salomone-González; A. Medina; J. M. M. Roco; P. L. Curto-Risso; A. Calvo Hernández. 2021. Multicriteria optimization of Brayton-like pumped thermal electricity storage with liquid media. Journal of Energy Storage. PERGAMON-ELSEVIER SCIENCE LTD. 44-103242, pp.1-15. ISSN 2352-152X. https://doi.org/10.1016/j.est.2021.103242

5 **Scientific paper**. W. Peng; (2/5) J. Gonzalez-Ayala; G. Su; J. Chen; A. Calvo-Hernández. 2021. Solar-driven sodium thermal electrochemical converter coupled to a Brayton heat engine: Parametric optimization. Renewable Energy. Elsevier. 164-2021, pp.260-271. ISSN 0960-1481. https://doi.org/10.1016/j.renene.2020.09.084

6 **Scientific paper**. W. Peng; (2/5) J. Gonzalez-Ayala; S. Su; J. Chen; A. Calvo Hernández. 2020. A two-stage sodium thermal electrochemical converter: Parametric optimization and performance enhancement. Journal of Power Sources. Elsevier. 480-229147, pp.1-9. ISSN 0378-7753. https://doi.org/10.1016/j.jpowsour.2020.229147

7 **Scientific paper**. J. Gonzalez-Ayala; A. Medina; J. M. M. Roco; A. Calvo Hernández. 2020. Thermodynamic optimization subsumed in stability phenomena. Scientific Reports. Springer Nature. 10-14305. ISSN 2045-2322.

8 **Scientific paper**. (1/5) J. Gonzalez-Ayala (AC); J. Guo; A. Medina; J. M. M. Roco; A. Calvo Hernández. 2020. Energetic self-optimization induced by stability in low-dissipation heat engines. Physical Review Letters. American Physical Society. 124-050603, pp.1-5. ISSN 0031-9007. https://doi.org/10.1103/PhysRevLett.124.050603

9 **Scientific paper**. R.P. Merchán; M.J. Santos; I. Heras; (4/6) J. Gonzalez-Ayala; A. Medina; A. Calvo Hernández. 2020. On-design pre-optimization and off-design analysis of hybrid Brayton thermosolar tower power plants for different fluids and plant configurations. Renewable and Sustainable Energy Reviews. PERGAMON-ELSEVIER SCIENCE LTD. 2019-109590, pp.1-22. ISSN 1364-0321. https://doi.org/10.1016/j.rser.2019.109590

10 **Scientific paper**. (1/3) J. Gonzalez-Ayala; A. Calvo Hernández; M. Santillán. 2023. Thermodynamic performance of coupled enzymatic reactions: A chemical kinetics model for analyzing cotransporters, ion pumps, and ATP synthases. Biophysical Chemistry. PERGAMON-ELSEVIER SCIENCE LTD. 293-106932, pp.1-7. ISSN 03014622. https://doi.org/10.1016/j.bpc.2022.106932

11 **Scientific paper**. Zhexu Li; (2/5) J. Gonzalez-Ayala; Hanxin Yang; Juncheng Guo; A Calvo Hernández. 2022. Low-dissipation model of three-terminal refrigerator: Performance bounds and comparative analyses. Journal of Physics A: Mathematical and Theoretical. Institute of Physics IOPScience. 55-065001, pp.065001-1-065001-19. ISSN 1751-8121. https://doi.org/10.1088/1751-8121/ac47b0

12 **Scientific paper**. (1/6) J. Gonzalez-Ayala (AC); A. Calvo Hernández; J. A. White; A. Medina; J. M. M. Roco; S. Velasco. 2022. Success versus failure: Efficient heat devices in thermodynamics. Physical Review E. American Physical Society. 105-014115, pp.014115-1-014115-6. ISSN 2470-0053. https://doi.org/10.1103/PhysRevE.105.014115

13 **Scientific paper**. D. Pérez Gallego; (2/4) J. Gonzalez-Ayala; A. Calvo Hernández; A. Medina. 2021. Thermodynamic Performance of a Brayton Pumped Heat Energy Storage System: Influence of Internal and External Irreversibilities. Entropy. MDPI. 23-1564, pp.1-20. ISSN 1099-4300. https://doi.org/10.3390/e23121564

C.3. Research projects and contracts

1 **Project**. FS/7-2023, Evaluación de sistemas de almacenamiento térmico aplicados a condiciones locales para el aprovechamiento eficiente de fuentes renovables. Fundación Memoria de D. Samuel Solórzano Barruso. Julián González Ayala. (University of Salamanca). 21/12/2023-20/12/2024. 1.320 €. El proyecto cuenta con la participación de 5 investigadores: Julián González Ayala (IP), Alejandro, Medina Domínguez, Rosa Pilar Merchán Corral, David Pérez Gallego, Judit García Ferrero. En el proy...

2 **Project**. Inteligencia Artificial para la Transición Energética Sostenible (IA4TES). Comisión Europea. Malumbres Martínez 1. (Universidad de Salamanca). 01/01/2022-2024. 125.000.000 €. IA4TES, con una duración de 3 años (2022-2024) es un proyecto de investigación sobre las soluciones que proporcionan las distintas tecnologías de Inteligencia Artificial en el sector eléctrico. Al am...

3 **Project**. Proyecto programa propio II contratos posdoctorales USAL conv. 2019. Universidad de Salamanca. Julián González Ayala. (University of Salamanca). 26/11/2020-04/10/2022. 60.720 €.

4 **Project**. Estudio de viabilidad de una planta termosolar de torre central operando con CO2 supercrítico y almacenamiento térmico. (Universidad de Salamanca). 21/04/2021-30/09/2021. 4.500 €.

5 **Project**. FSE_1_2018_1_153077, PHES: Almacenamiento de energía eléctrica con bombas de calor y su impacto en la matriz energética nacional. Fondo Sectorial de Energía. Pedro Andrés Galione Klot. (Universidad de la República, Montevideo). 11/06/2019-11/06/2021. 58.760 €. El sistema eléctrico nacional está experimentando nuevos desafíos debido al aumento de la energía generada a través del uso de fuentes renovables, las cuales son de disponibilidad variable y no gesti...

6 **Project**. Planta de concentración termosolar de disco parabólico con ciclo Brayton híbrida para generación distribuida de energía. (Universidad de Salamanca). 25/06/2019-25/06/2020. 12.000 €.

7 **Project**. Generación limpia y eficiente de energía eléctrica y calor a pequeña escala: parábolas termosolares híbridas. (Universidad de Salamanca). 01/01/2019-31/12/2019. 10.000 €.