

Fecha del CVA	29/09/2025
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Parte A. DATOS PERSONALES

Nombre	Daniel		
Apellidos	Manzano Diosdado		
Sexo	Hombre	Fecha de Nacimiento	
DNI/NIE/Pasaporte			
URL Web	http://ic1.ugr.es/manzano/		
Dirección Email			
Open Researcher and Contributor ID (ORCID)	0000-0001-9241-5884		

A.1. Situación profesional actual

Puesto	Profesor Titular		
Fecha inicio	2022		
Organismo / Institución	Universidad de Granada		
Departamento / Centro	Electromagnetismo y Física de la Materia / Facultad de Ciencias		
País		Teléfono	
Palabras clave			

Parte B. RESUMEN DEL CV

I am a tenured professor at the Department of Electromagnetism and Condensed Matter at the University of Granada, Spain, where I lead the Quantum Thermodynamics and Quantum Computation group. Additionally, I am a member of the "Carlos I" Institute for Theoretical and Computational Physics. I earned my PhD from the University of Granada, specialising in the entanglement properties of atoms. Following my doctoral studies, I joined the Quantum Information group led by Prof. Hans J. Briegel at the University of Innsbruck, where I spent three years researching the transport properties of quantum systems, stochastic thermodynamics, quantum effects in photosynthetic complexes, and quantum learning. Subsequently, I pursued further research at the Massachusetts Institute of Technology (MIT) under the guidance of Prof. Jianshu Cao for one year. Finally, I expended one year at the Singapore University of Technology and Design (SUTD), supervised by Prof. Elica Kyoseva, before returning to Granada on a Marie Curie Fellowship through the Talent Hub program.

My research primarily focuses on Quantum Thermodynamics, Open Quantum Systems, Quantum Information, and Quantum Machine Learning. According to the Web of Science, my work has resulted in 30 papers published in peer-reviewed journals, accruing more than 1000 citations. I have an h-index of 15, and one of my solo-authored papers is classified as "highly cited". As the leader of the Quantum Thermodynamics and Quantum Computing group at the University of Granada, I oversee a team of eight members, including two Junior Professors (Ramón y Cajal fellows), three postdoctoral researchers, and two PhD students. I have served as Principal Investigator (PI) for three research projects, one funded by the Andalusian government and two by the Spanish Ministry of Science, with a combined total of over €250,000 in funding over the last five years. Additionally, I have contributed to numerous other research projects in the field.

In my role as an educator, I have taught various courses in both Spanish and English, earning an "excellent" evaluation from my university. I have guided numerous undergraduates and master's students to achieve outstanding results. Currently, I am supervising a PhD candidate, Alvaro Tejero, who is a recipient of an FPU fellowship. I have also contributed to pedagogical innovation, authoring two papers on science education, and I am actively involved in public science communication. My efforts in this area have been recognised with two awards, and I have contributed to several science blogs and journals.

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 citaciones

- 1 **Artículo científico.** D. Esteve; C. Pérez-Espigares; R. Gutiérrez; D. Manzano. 2025. Optimizing quantum transport via the quantum Doob transform. arXiv preprint arXiv:2508.04622.
- 2 **Artículo científico.** A. Tejero; R. Sánchez; L. El Kaoutit; (4/5) D. Manzano (AC); A. Lasanta. 2025. Asymmetries of thermal processes in open quantum systems. *Physical Review Research*. 7, pp.023020.
- 3 **Artículo científico.** J. Dunlop; A. Tejero; M. Skotiniotis; (4/4) D. Manzano (AC). 2025. Thermodynamics of Hamiltonian anyons with applications to quantum heat engines. *Arxiv*. pp.2502.19019.
- 4 **Artículo científico.** J.J. Torres; (2/2) D. Manzano (AC). 2024. Dissipative Quantum Hopfield Network: A numerical analysis. *New Journal of Physics*. 26, pp.103018.
- 5 **Artículo científico.** A. Tejero; (2/3) D. Manzano (AC); P.I. Hurtado. 2024. Squeezing light to get non-classical work in quantum engines. Preprint.
- 6 **Artículo científico.** Julio; Antonio; Juana; Daniel. 2024. Entanglement detection with classical deep neural networks. *Scientific Reports. Nature*. 14-18109.
- 7 **Artículo científico.** A. Tejero; D. Manzano; P.I. Hurtado. 2024. Atom-doped photon engine: Extracting mechanical work from a quantum system via radiation pressure. *Phys. Rev. E*. 109, pp.024141.
- 8 **Artículo científico.** J. Torres; D. Manzano. 2022. A model of interacting quantum neurons with a dynamic synapse. *New Journal of Physics. IOP*. 24, pp.073007.
- 9 **Artículo científico.** Daniel; Miguel Ángel; Pablo I. 2021. Coupled activity-current fluctuations in open quantum systems under strong symmetries. *New Journal of Physics*. 23, pp.073044.
- 10 **Artículo científico.** Juzar; Daniel. 2021. Degenerated Liouvillians and steady-state reduced density matrices. *Chaos: An Interdisciplinary Journal of Nonlinear Science*. 31, pp.073114.
- 11 **Artículo científico.** Alvaro; Juzar; Daniel. 2021. Comment on “Loss-Free Excitonic Quantum Battery”. *The Journal of Physical Chemistry C*. 123, pp.7518.
- 12 **Artículo científico.** J. Thingna; D. Manzano; J. Cao. 2020. Magnetic field induced symmetry breaking in nonequilibrium quantum networks. *New J. Phys.* 22, pp.083026.
- 13 **Artículo científico.** D. Manzano. 2019. A short introduction to the Lindblad Master Equation. *AIP Advances*. 10, pp.025106.
- 14 **Artículo científico.** D. Manzano; P.I. Hurtado. 2018. Harnessing symmetry to control quantum transport. *Advances in Physics*. 67-1, pp.1.
- 15 **Artículo científico.** P.L. Garrido; P.I. Hurtado; D. Manzano; F. de los Santos. 2018. Editorial: Quantum systems in and out of equilibrium Fundamentals, dynamics, and applications. *European Physical Journal - Special Topics. IOP*. 227, pp.201.
- 16 **Artículo científico.** D. Manzano; E. Kyoseva. 2016. An atomic symmetry-controlled thermal switch. *Scientific Reports*. 6-31161.
- 17 **Artículo científico.** J. Thingna; D. Manzano; J. Cao. 2016. Dynamical signatures of molecular symmetries in nonequilibrium quantum transport. *Scientific Reports*. 6-28027.
- 18 **Artículo científico.** D. Manzano; C. Chuang; J. Cao. 2016. Quantum transport in d-dimensional lattices. *New Journal of Physics*. 18-043044.
- 19 **Artículo científico.** H.J. Briegel; M. Tiersch; D. Manzano; A. Makmal; J. Mautner. 2015. Projective Simulation for Classical Learning Agents: A Comprehensive Investigation. *New Generation Computing. Springer*. 33, pp.69-114.
- 20 **Artículo científico.** D. Manzano; P.I. Hurtado. 2014. Symmetry and thermodynamics of currents in open quantum systems. *Physical Review B*. 90, pp.125138.

- 21 **Artículo científico.** A. Makmal; M. Zhu; D. Manzano; M. Tiersch; H.J. Briegel. 2014. Quantum walks on embedded hypercubes. *Physical Review A*. 90, pp.022314.
- 22 **Artículo científico.** D. Manzano. 2013. Quantum Transport in Networks and Photosynthetic Complexes at the Steady State. *Plos One*. Plos. 8-2, pp.e57041.
- 23 **Artículo científico.** A. Asadian; D. Manzano; M. Tiersch; H.J. Briegel. 2013. Heat transport through lattices of quantum harmonic oscillators in arbitrary dimensions. *Physical Review E*. American Physical Society. 87, pp.012109.
- 24 **Artículo científico.** D. Manzano; M. Tiersch; A. Asadian; H.J. Briegel. 2012. Quantum transport efficiency and Fourier's law. *Physical Review E*. American Physical Society. 86, pp.061118.
- 25 **Artículo científico.** D. Manzano. 2012. Statistical measure of complexity for quantum systems with continuous variables. *Physica A: Statistical Mechanics and its Applications*. Elsevier. 391, pp.6238.
- 26 **Artículo científico.** P. Sánchez-Moreno; D. Manzano; J.S. Dehesa. 2011. Direct spreading measures of Laguerre polynomials. *Journal of Computational and Applied Mathematics*. Elsevier. 235, pp.1129.
- 27 **Artículo científico.** D. Manzano; S. López-Rosa; J.S. Dehesa. 2010. Complexity analysis of Klein-Gordon single-particle systems. *EPL (Europhysics Letters)*. IOP Publisher. 90, pp.48001.
- 28 **Artículo científico.** D. Manzano; A.R. Plastino; J.S. Dehesa; T. Koga. 2010. Quantum entanglement in two-electron atomic models. *Journal of Physics A: Mathematical and Theoretical*. IOP. 43, pp.275301.
- 29 **Artículo científico.** P. Sanchez-Moreno; D. Manzano; J.S. Dehesa. 2010. Spreading lengths of Hermite polynomials. *Journal of Computational and Applied Mathematics*. 235, pp.1129.
- 30 **Artículo científico.** D. Manzano; R.J. Yáñez; J.S. Dehesa. 2010. Relativistic Klein-Gordon charge effects by information-theoretic measures. *New Journal of Physics*. IOP Publisher. 12, pp.023014.
- 31 **Artículo científico.** J.S. Dehesa; S. Lopez-Rosa; D. Manzano. 2009. Configuration complexities of hydrogenic atoms. *The European Physical Journal D*. 55, pp.539.
- 32 **Artículo científico.** D. Manzano; M. Pawłowski; C. Brukner. 2009. The speed of quantum and classical learning for performing the k-th root of NOT. *New Journal of Physics*. IOP Publisher. 11, pp.113018.
- 33 **Artículo científico.** S. Lopez-Rosa; D. Manzano; J.S. Dehesa. 2009. Complexity of D-dimensional hydrogenic systems in position and momentum spaces. *Physica A: Statistical Mechanics and its Applications*. Elsevier. 388, pp.3273.
- 34 **Artículo científico.** A.R. Plastino; D. Manzano; J.S. Dehesa. 2009. Separability Criteria and Entanglement Measures for Pure States of N Identical Fermions. *Europhysics Letters*. IOP Publishing. 86, pp.20005.
- 35 **Libro o monografía científica.** D. Manzano. 2011. *Information and Entanglement Measures in Quantum Systems With Applications to Atomic Physics*. ISBN 978-3-8443-2906-3. LAP LAMBERT Academic Publishing.
- 36 **Edición científica.** D. Manzano; F. de los Santos; P.I. Hurtado. 2018. *Quantum Systems In and Out of Equilibrium - Fundamentals, Dynamics and Applications*. *European Physical Journal - Special Topics*. IOP. 227, pp.201-322.

C.3. Proyectos o líneas de investigación

- 1 **Proyecto.** PROYECTO QUANTUM SPAIN 2023. Centro de Supercomputación de Barcelona. Daniel Manzano. (Universidad de Granada). 01/09/2023-31/12/2025. 127.550 €.
- 2 **Proyecto.** Dissipative Quantum Machine Learning: A bridge between Open Quantum Systems and Artificial Intelligence (DissQML). Ministerio de Ciencia e Innovación. Daniel Manzano. (University of Granada). 01/09/2022-31/08/2025. 115.918 €.
- 3 **Proyecto.** Aplicaciones del machine learning cuántico. Daniel Manzano. (Universidad de Granada). 01/01/2022-30/06/2023. 20.000 €.

- 4 **Proyecto.** Física estadística de los sistemas complejos: de los principios básicos a las fronteras de la física de la materia, ecología y neurociencia.. (Universidad de Granada). 01/11/2016-31/03/2018.
- 5 **Proyecto.** Control of Energy Flows and Stability in Quantum Nanodevices (TAHUB/II-148). Daniel Manzano Diosdado. (Universidad de Granada). 01/10/2015-30/09/2017. 150.593 €.
- 6 **Proyecto.** Control of energy flows and stability in quantum devices. Daniel Manzano Diosdado. (Massachusetts Institute of Technology and Singapore University of Technology and Design). 01/10/2014-30/09/2015.
- 7 **Proyecto.** Atomic, molecular and non-linear systems: Spectroscopy, transport phenomena and information measures. (FIS2008-02380). Jesús Sánchez-Dehesa Moreno-Cid. (Universidad de Granada). 01/01/2008-31/12/2011.
- 8 **Proyecto.** Spectroscopic properties and information theory in atomic, molecular and non-linear systems. (FIS2005-00973). MINISTERIO DE EDUCACION Y CIENCIA. Jesús Sánchez-Dehesa Moreno-Cid. (Universidad de Granada). 01/01/2006-31/12/2008.
- 9 **Proyecto.** Funciones especiales, entropías cuánticas y aplicaciones bio- y nanotecnológicas. Jesús Sánchez-Dehesa Moreno-Cid. (University of Granada). Desde 02/01/2006.
- 10 **Proyecto.** Física Atómica y Molecular. Jesús Sánchez-Dehesa Moreno-Cid. (Universidad de Granada).