

CURRICULUM VITAE (maximum 4 pages)

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

PERSONAL INFORMATION			
First name	González Férez		
Family name	María Rosario		
Gender (*)	Female	Birth date	
Social Security, Passport, IDnumber			
e-mail		URL Web	
Open Researcher and Contributor ID (ORCID) (*)		0000-0002-8871-116X	

(*) Mandatory

A.1. Current position

Position	Catedrático de Universidad (Full Professor)		
Initial date	December 28, 2021		
Institution	Universidad de Granada		
Department/Center	Física Atomica, Molecular y Nuclear		
Country	Spain	Teleph.number	958243215
Key words	Ultracold and cold atoms and molecules, Rydberg atoms and Rydberg molecules		

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

Period	Position/Institution/Country/Interruption cause
2008-2021	Associate Professor, Universidad de Granada, Spain
2004-2008	Researcher, Universidad de Granada, Spain
2001-2024	Postdoc, Universität Heidelberg, Germany, Alexander von Humboldt fellowship

A.3. Education

PhD, Licensed, Graduate	University/Country	Year
PhD in Physics	Universidad de Granada	2001
Licensed in Physics	Universidad de Granada	1996

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

I am Full Professor at the Department of Atomic Molecular and Nuclear Physics at the Universidad de Granada (UGR) in Spain since 2021, chair of the department.

Scientific expertise: My research is devoted to theoretically investigate the structure, interactions, and dynamics of cold and ultracold atoms and molecules in external fields, highlighting the theoretical interpretation of experimental results and experimental proposal for creating ultracold systems. My theoretical work on rotational dynamics in combined electric and laser fields has explained the experimental observations of the mixed-field orientation of molecules, showed that it is a nonadiabatic process and provided the experimental conditions to reach the adiabatic limit (2PRL). I have also investigated the formation of ultracold molecules providing a technique to use external fields to enhance formation rates (PRL) and the interpretation of the coherent association of atoms into a single weakly bound NaCs molecule in an optical tweezer (PRX). For Rydberg systems, I have explored the dynamics of Rydberg atoms in an optical lattice (PRL) and the structure of ultralong-range Rydberg molecules (PRL and NJP). In a joint theory-experiment collaboration, we have demonstrated for the first time the Rydberg blockade due to the charge dipole interaction between the Rydberg electron and the diatomic molecule (PRL).

Scientific outcome: I have published over 75 peer-reviewed papers in high-impact journals (1 Phys. Rev. X, 7 Phys. Rev. Let., New J. Phys., J. Chem. Phys., Phys. Chem. Chem. Phys., Phys. Rev. A). My results have been presented in many international workshops and conferences in AMO physics, 40 times as invited speaker. I have given more than 35 invited lectures and seminars at different universities and research centers around the world. My research has been funded through local (4 as PI), regional (1 as PI), and national projects (3 as PI), as well as with a Marie Curie Action Initial Training Network of the European Union (PI of the UGR node). I have done research stays at University of British Columbia, ITAMP-Harvard University (Fulbright fellow), Freie Universität Berlin, University of Connecticut, University of Heidelberg (Alexander von Humboldt fellow), University of Tübingen, University of Hamburg, and The Kavli Institute for Theoretical Physics at University of California Santa Barbara. Due to my contributions in the field of atomic and molecular physics, I have received The Mildred Dresselhaus Award for Young Scientists 2013 from The Hamburg Centre for Ultrafast Imaging (CUI) at the University of Hamburg (Hamburg, Germany).

Outreach and social impact: I participate in the programs “Mujer y Niña en la Ciencia”, “Ciencia y Sociedad”, “Semana de la Ciencia”, “Día de puertas abiertas del Parque de las Ciencias de Granada”, “Pint of Science”, and I regularly give scientific talks about physics and female physicist in high schools and primary schools. I was jury of the awards “Premios de Física Real Sociedad Española de Física - Fundación BBVA” and “Premios Rei Jaume I” 2023.

Academic and scientific management: I have been the academic coordinator of the Master Program in Physics and Mathematics FisyMat of the UGR (November 2012 - May 2017), and I am member of the academic commission of the Doctoral Program in Physics and Mathematics FisyMat. I was Chair of the board of the European Group of Atomic Systems EGAS of the European Physical Society (EPS) 2018-2024, Chair of the Commission on Atomic, Molecular and Optical Physics (C.15) of the International Union of Pure and Applied Physics (IUPAP) for the term 2022 – 2024, and member of the Atomic, Molecular and Optical Physics Division of the EPS 2018-2025. I am editor in the Journal of Physics B: Atomic, Molecular and Optical Physics. I have been Referee of the ANEP (Ayudas Formación Posdoctoral 2013, Ramon y Cajal 2014 and 2023, Plan Nacional), of La Caixa Fellowship Program, of the German Research Foundation, and of the European Research Council. I am the president of Physics in the “Agencia Estatal de Investigación” AEI.

Formation of young researchers: I have supervised 6 PhD theses, 18 Master theses, 9 Bachelor theses, and currently I am supervising 2 PhD students. Three of my PhD students are associate professors at the University of Tübingen, Universidad Complutense de Madrid, and UGR. I have co-organized 7 summer schools on quantum matter.

Part C. RELEVANT MERITS (sorted by typology)

C.1. Publications (see instructions)

In the period 2014-2025, I have published 35 papers in peer review journals. A selection of my publications:

- A. Guttridge, D. K. Ruttley, **R. González-Férez**, H. R. Sadeghpour, C. S. Adams, and S. L. Cornish, (2023) *Observation of Rydberg blockade due to the charge-dipole interaction between an atom and a polar molecule*, Physical Review Letters **131**, 013401.
- L. R. B. Picard, J. T. Zhang, W. B. Cairncross, et al (2023), *High resolution photoassociation spectroscopy of the excited $c^3\Sigma^+$ potential of $^{23}\text{Na}^{133}\text{Cs}$* , Physical Review Research **5**, 023149, 10/11 authors.
- Y. Yu, K. Wang, J.D. Hood, L.R.B. Picard, et al, (2021) *Coherent optical creation of a single molecule*, Physical Review X **11**, 031061. 7/9 authors.
- **R. González-Férez**, J. Shertzer, and H. R. Sadeghpour, (2021) *Ultralong-Range Rydberg Bimolecules*, Physical Review Letters **126**, 043401.
- **R. González-Férez**, M. Iñarrea, J.P. Salas and P. Schmelcher, (2020) *Nonlinear dynamics and energy transfer for two rotating dipoles in an external field: A complete dimensional analysis*, Communications in Nonlinear Science and Numerical Simulation **82**, 105049.
- N. Sandor, **R. González-Férez**, P.S. Julienne, and G. Pupillo, (2017) *Rydberg optical Feshbach resonances in cold gases*, Physical Review A **96**, 032719.

- S. Trippel, T. Mullins, N.L.M. Müller, J.S. Kienitz, **R. González-Férez** and J. Küpper, (2015) *Two-State Wave Packet for Strong Field-Free Molecular Orientation*, Physical Review Letters **114**, 103003.
- **R. González-Férez**, H.R. Sadeghpour and P. Schmelcher, (2015) *Rotational hybridization, and control of alignment and orientation in triatomic ultralong-range Rydberg molecules*, New Journal Physics **17**, 013021.
- M. Tomza, **R. González-Férez**, C.P. Koch, and R. Moszynski, (2014) *Controlling magnetic Feshbach resonances in polar open-shell molecules with non-resonant light*, Physical Review Letters **112**, 113201.
- J.H. Nielsen, H. Stapelfeldt, J. Küpper, B. Friedrich, J.J. Omiste and **R. González-Férez**, (2012) *Making the Best of Mixed-Field Orientation of Polar Molecules: A Recipe for Achieving Adiabatic Dynamics in an Electrostatic Field Combined with Laser Pulses*, Physical Review Letters **108**, 193001.

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

During the last 10 years, I have given 35 invited talks at international conferences and workshops on AMO physics, and more than 25 seminars at universities and research centers. A selection of 10 invited talks in the last 10 years:

- Invited Speaker, XXIX International Conference on Photonic, Electronic, and Atomic Collisions (ICPEAC), Toledo (Spain), July 2015.
- Invited Speaker, 47th Annual Meeting of the Division of Atomic, Molecular, and Optical Physics - DAMOP 2016, Providence (USA), June 2016.
- Invited Speaker, 10th International Meeting on Photodynamics and Related Aspects, Cartagena, (Colombia), September 2018.
- Invited Speaker, 10th Congress of the International Society of Theoretical Chemical Physics (ISTCP-X) Tromsø (Norway), July 2019.
- Discussion Leader, GRC Quantum Control of Light and Matter, Newport (USA), 2019.
- Invited Speaker, Cold Rydberg Chemistry, Online Workshop, November 22-23, 2021.
- Invited Speaker, Cold and Controlled Molecules & Ions Conference 2022, Durham (UK), 4-9 September, 2022
- Invited Speaker, New directions in cold and ultracold chemistry, Leiden (Netherlands) 8-12 May, 2023
- Invited Speaker, GRC Quantum Control of Light and Matter, Newport (USA), August 2023.
- Invited Speaker, Giant Interactions in Rydberg Systems, Bad Honnef (Germany), 1-3, November, 2023.

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

Selection of the projects that I have been involved:

- Información, Complejidad y No-Linealidad: Aplicaciones Multidisciplinares. Ref. A-FQM-52-UGR20. Universidad de Granada. PI: **R. González-Férez**. Duration: 2021 – 2023.
- Desorden en Sistemas Físicos: Complejidad, Interacciones y No-linealidad. Ref. PY2_000082, Plan Andaluz de Investigación, Desarrollo e Innovación (PAIDI 2020), Junta de Andalucía. PI: **R. González-Férez**. Duration: 2021-2023.
- *Interfacing Ultracold Polar Molecules with Rydberg atoms: A Hybrid Platform for Quantum Science*. Ref. EP/V047302/1, Engineering and Physical Sciences Research Council, United Kingdom. PI: S. L. Cornish (Durham University). Duration: 2021 - 2023.
- Sistemas Híbridos: Aspectos Cuánticos y Clásicos. Ref. PID2020-113390GB-I00, Ministerio de Ciencia e Innovación. PI: **Rosario González-Férez**. Duration: 2021 – 2024.
- No-linealidad, Control e Incertidumbre Cuánticas. Ref. FIS2017-89349-P, Ministerio de Economía y Competitividad. PI: **R. González-Férez**. Duration: 2018 – 2020.
- Control de Sistemas Cuánticos. Project FIS2014-54497-P, Ministerio de Economía y Competitividad. PI: **R. González-Férez**. Duration: 2015 – 2017.
- Teoría de la Aproximación, Funciones Especiales y Modelos Matemáticos: de la Teoría a las Aplicaciones Oftalmológicas. Excellence Research Project P11-FQM-7276, Junta de Andalucía. PI: A. Martínez-Finkelshtein. Duration: 30/04/2013-29/04/2017.

- *COHERENCE-Cooperativity in Highly Excited Rydberg Ensembles - Control and Entanglement*. Project n. 265031 FP7-PEOPLE-2010-ITN, *Marie Curie Actions Initial Training Networks*, European Commission. PI Universidad de Granada: **R. González-Férez**, PI: M. Weidemüller (University of Heidelberg). Duration: 09/1/2011 – 08/31/2015.

C.4. Contracts, technological or transfer merits, Include patents and other industrial or intellectual property activities (contracts, licenses, agreements, etc.) in which you have collaborated. Indicate: a) the order of signature of authors; b) reference; c) title; d) priority countries; e) date; f) Entity and companies that exploit the patent or similar information, if any

C.5. Others

C.5.1 Organization of Workshops and Conferences

- Special Functions, Information Theory and Mathematical Physics. An interdisciplinary conference in honor of Prof. J. S. Dehesa's 60th birthday 9/17-19/2007, Granada
- Cold and Ultracold Molecules Workshop, 11/4-6/2013, Granada
- YEA meeting and Idea Factory, 9/8-9/2014, Granada
- Ultracold Rydberg Physics Workshop, 9/10-12/2014, Granada
- Third International Workshop on Ultracold Rydberg Physics, Recife Brazil 12/02-05/2018.
- Summer School Series on Quantum Matter 2011, 2013, 2015, 2017, 2019, 2023, Granada

C.5.2 Member of the Following Scientific Committees

- Scientific Panel of the Conference Series on Cold and Controlled Molecules and Ions 2012, 2014, 2016, 2018, 2020, 2022.
- Scientific Committee the Final Conference of the ITN COHERENCE, 06/28 to 07/03, 2015, Durham (UK).
- Ultracold Quantum Matter and Quantum Simulation subcommittee of the CLEO/Europe-EQEC 2017 and 2019.
- Commission on Atomic, Molecular and Optical Physics (C.15) of the International Union of Pure and Applied Physics (IUPAP) for the term 2018 – 2021.
- Board of the Atomic, Molecular and Optical Physics Division (AMOPD) of the European Physical Society (EPS) since July 2018.
- Board of the European Group of Atomic Systems (EGAS) of the EPS since July 2017.
- Chair of the board of European Group of Atomic Systems EGAS since July 2018.
- Chair of the Commission on Atomic, Molecular and Optical Physics (C.15) of the International Union of Pure and Applied Physics (IUPAP) for the term 2022 – 2024.

C.5.3 Institutional responsibilities at the Universidad de Granada

- Academic Coordinator of the Master Program in Physics and Mathematics, 10/25/2012 to 5/29/2017.
- Member of the Academic Commission of the PhD Program in Physics and Mathematics since 1/10/2013.
- Member of the Academic Commission of the Physics BsC., since 2018.
- Erasmus Coordinator of the Double Degree in Physics and Mathematics, since 2018.
- Member of Consejo de Dirección, Instituto Carlos I de Física Teórica y Computacional (IC1)
- Coordinator of the research group Física Cuántica y Física Matemática of the IC1

C.5.4 Editorial Board

- Editor in the Journal of Physics B: Atomic, Molecular and Optical Physics
- Editor of the *IOP SciNotes*.

C.5.5 Awards and Honors

- Special Mention with Honors in the studies B. Sc. in Physics, Spain, 1996.
- "Award for Excellence" in Ph.D. in Physics (2000-2001). University of Granada.
- Alexander von Humboldt Foundation Postdoctoral Scholarship 04/2002 to 01/2004.
- Fulbright fellowship at Harvard University, 03/2020 to 07/2020.
- The Mildred Dresselhaus Award for Young Scientists 2013 (first recipient) of The Hamburg Center for Ultrafast Imaging, Universität Hamburg, Hamburg (Germany).