

Lucas Lamata

Curriculum Vitæ

CONTACT INFORMATION

- **Address :**
Department of Physical Chemistry, University of the Basque Country UPV/EHU
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 - **E-Mail:** lucas.lamata@gmail.com **ResearcherID:** B-2439-2009
 - **Personal Webpage:** <http://sites.google.com/site/lucaslamata/>
 - **QUTIS Group Webpage:** <http://www.qutisgroup.com>
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POSITIONS

1. **Position:** Ramón y Cajal Researcher.
Financing Organism: Spanish Ministry of Economy (MINECO).
Place: University of the Basque Country, Bilbao, Spain.
Department: QUTIS (Prof. Enrique Solano's Group).
Period: December 1st 2013-Today.
2. **Position:** Researcher.
Financing Organism: European Commission.
(SCALEQIT EU Integrated Project).
Place: University of the Basque Country, Bilbao, Spain.
Department: QUTIS (Prof. Enrique Solano's Group).
Period: May 1st 2013-November 30th 2013.
3. **Position:** Marie Curie IEF Postdoctoral Fellow.
Financing Organism: European Commission.
Place: University of the Basque Country, Bilbao, Spain.
Department: QUTIS (Prof. Enrique Solano's Group).
Period: May 1st 2011-April 30th 2013.
4. **Position:** Max-Planck Postdoctoral Fellow.
Financing Organism: Max-Planck Society.
Place: Max-Planck Institute for Quantum Optics, Garching, Germany.
Department: Theory Division (Prof. Ignacio Cirac's Group).
Period: March 1st 2009-April 30th 2011.
5. **Position:** Humboldt Research Fellow.
Financing Organism: Alexander von Humboldt Foundation, Bonn.
Place: Max-Planck Institute for Quantum Optics, Garching, Germany.
Department: Theory Division (Prof. Ignacio Cirac's Group).
Period: December 1st 2007-February 28th 2009.

6. **Position:** PhD FPU Fellow.
Financing Organism: Ministry of Education of Spain.
Place: Instituto de Física Fundamental, CSIC, Madrid, Spain.
Department: QUINFOG (Prof. Juan León's Group).
Period: January 1st 2004-September 22nd 2007.
7. **Position:** Undergraduate CSIC Researcher.
Financing Organism: Ministry of Science and Technology of Spain.
Place: Instituto de Física Fundamental, CSIC, Madrid, Spain.
Department: QUINFOG (Prof. Juan León's Group).
Period: September-December 2003.

RESEARCH INTERESTS

Quantum Optics, Quantum Information, Theoretical Physics, Quantum Simulations, Trapped Ion Physics, Superconducting Circuits, Quantum Photonics, Entanglement Classification, Entanglement Generation, Quantum Biomimetics, Artificial Intelligence, Machine Learning, and Embedding Quantum Simulators.

EDUCATION

1. **Title:** PhD in Physics.
Advisor: Prof. Juan León.
University: Universidad Autónoma de Madrid.
PhD Programme: Theoretical Physics (Mención de Calidad from the Ministry of Education and Science of Spain).
Thesis entitled: *Developments in entanglement theory and applications to relevant physical systems.*
Date of Defence: 27 April 2007.
Mark: Awarded Sobresaliente *Cum Laude* (Highest qualification) and *Doctor Europeus* award. Extraordinary Prize¹ for a PhD in Physics in Universidad Autónoma de Madrid.
Committee: J.I. Cirac, D. Salgado, G. García-Alcaine, M.A. Martín-Delgado, A. Cabello.
2. **Title:** Licenciatura (Undergraduate Degree) in Physics.
Branch: Theoretical Physics.
University: Universidad Complutense de Madrid.
Global mark: 2.7, being one of the top averages in my academic year (1=pass. 3=A. 4=A with honours).
Period: 97/03.

¹I obtained the First Extraordinary Prize (of a total of 4 Prizes) for a PhD in Physics in 2007 in Universidad Autónoma de Madrid. This means that my PhD Thesis was selected as the best among more than 30 PhD Theses defended in 2007 in Physics in UAM.

3. **Title:** High school studies (BUP and COU).
Place: I.E.S. Carlos Bousoño, Majadahonda (Madrid).
Global mark: 9.0 (of 9). Highest possible average. Matrícula de Honor.

COLLABORATIONS

I have published articles in international collaborations with up to **139 researchers**, from a variety of countries in **Europe, America, Asia, and Oceania** (USA, Germany, Austria, Spain, Switzerland, China, UK, Italy, The Netherlands, Sweden, Australia, Singapore, Belgium, Czech Republic, Chile, Luxembourg), including, among other institutions, the Max-Planck Institute for Quantum Optics, Harvard University, MIT, Google, IBM, University of Oxford, University of California Santa Barbara, Innsbruck University, ETH Zürich, Ludwig-Maximilian University Munich, University of Geneva, University of Massachusetts, Tsinghua University, Shanghai University, Zhejiang University, University of Nottingham, University of Bath, National University of Singapore, Delft University of Technology, Chalmers University of Technology, Max-Born Institute, University of Ulm, Karlsruhe Institute of Technology, University of Jena, University of Augsburg, University of Paderborn, University of Vienna, Australian National University, Macquarie University, University of Connecticut, Oklahoma State University, Erlangen-Nuremberg University, CNR, University of the Basque Country, CSIC, Universidad Autónoma de Madrid, Universidad Complutense de Madrid, Universidad de Valencia, University of Granada, University of Liege, Universidad de Santiago de Chile, Université Libre de Bruxelles. My theory articles have an **average of 5 coauthors**.

Being a theoretician, I have so far published proposals for implementations and **8 experiments** in collaboration with researchers of up to **14 leading experimental groups** in trapped ions, electrons in Penning traps, superconducting circuits, quantum photonics, and nuclear magnetic resonance.

Selected collaborators in publications: Enrique Solano (UPV/EHU), Juan León (CSIC), Ignacio Cirac (MPQ), Gonzalo Muga (UPV/EHU), Iñigo Egusquiza (UPV/EHU), Alán Aspuru-Guzik (Harvard), Mikhail Lukin (Harvard), Gerald Gabrielse (Harvard), Sauro Succi (CNR and Harvard), Susanne Yelin (UConn and Harvard), Vladan Vuletić (MIT), Isaac Chuang (MIT), John Martinis (Google), Hartmut Neven (Google), Dieter Jaksch (Oxford), Alexander Szameit (Jena), Gui-Lu Long (Tsinghua), Kihwan Kim (Tsinghua), Xi Chen (Shanghai), Tobias Schätz (Freiburg), Christian Roos (Innsbruck), Daniel Rodríguez (Granada), Andreas Wallraff (ETH), Leonardo DiCarlo (Delft), Per Delsing (Chalmers), Göran Johansson (Chalmers), Joseph Hope (ANU), Gabriel Molina-Terriza (Macquarie), Ivette Fuentes (Vienna), Daniel Braak (Augsburg), Miguel Angel Martin-Delgado (UCM), Girish Agarwal (Oklahoma), Jan von Delft (LMU).

Experimental Impact: Up to **11 of my theoretical proposals for implementations have been carried out in experiments** by top groups.

CITATIONS

Google Scholar “My Citations”: h-index 24; 2001 citations;
 SAO/NASA ADS database: h-index 22; 1485 citations;
 ISI Web of Knowledge: h-index 20; 1203 citations.

Most cited article: L. Lamata *et al.*, *Dirac Equation and Quantum Relativistic Effects in a Single Trapped Ion*, PRL **98**, 253005 (2007).
 Google Scholar: 253 cit.; ADS: 190 cit.; ISI: 166 cit.

“Scientific Reputation” RG (Research Gate) Score: 36.40
 (higher than 95% of RG members)

PUBLICATIONS

Publication Summary: 1 Nature, 2 Nature Commun., 1 Phys. Rev. X, 18 Phys. Rev. Lett. (2 Editor’s Suggestions), 17 Sci. Rep., 1 Phys. Rev. B, 15 Phys. Rev. A, 2 New J. Phys., 3 EPJ Quantum Technology, 1 Quantum Meas. Quantum Metrol., 1 J. Phys. A, 1 J. Opt. B, 1 Phys. Scr., 1 Concepts Phys. I have overall **59 articles published in first quartile (Q1) journals.**

Preprints

1. J. S. Pedernales, M. Beau, S. M. Pittman, I. L. Egusquiza, L. Lamata, E. Solano, and A. del Campo. *Dirac Equation in (1+1)D Curved Spacetime and multi-photon Quantum Rabi Model*. ArXiv:1707.07520.
2. Carlos Sabín, Borja Peropadre, Lucas Lamata, and Enrique Solano. *Superluminal Physics with Superconducting Circuit Technology*. ArXiv:1612.06774.
3. Unai Alvarez-Rodriguez, Lucas Lamata, Pablo Escandell-Montero, José D. Martín-Guerrero, and Enrique Solano. *Quantum Machine Learning without Measurements*. ArXiv:1612.05535.
4. Xiang Zhang, Kuan Zhang, Yangchao Shen, Jingning Zhang, Man-Hong Yung, Jorge Casanova, Julen S. Pedernales, Lucas Lamata, Enrique Solano, and Kihwan Kim. *Fermion-antifermion scattering via boson exchange in a trapped ion*. ArXiv:1611.00099.
5. Tao Xin, Julen S. Pedernales, Lucas Lamata, Enrique Solano, and Gui-Lu Long. *Measurement of Linear Response Functions in NMR*. ArXiv:1606.00686.

Refereed articles

6. Diego Barberena, Lucas Lamata, and Enrique Solano. *Dispersive Regimes of the Multiqubit Quantum Rabi Model*. Sci. Rep., *in press*. ArXiv:1703.03377.

7. F. Domínguez, I. Arrazola, J. Doménech, J. S. Pedernales, L. Lamata, E. Solano, and D. Rodríguez. *A Single-Ion Reservoir as a High-Sensitive Sensor of Electric Signals*. *Sci. Rep.*, *in press*. ArXiv:1612.08577.
8. L. García-Álvarez, I. L. Egusquiza, L. Lamata, A. del Campo, J. Sonner, and E. Solano. *Digital Quantum Simulation of Minimal AdS/CFT*. *Phys. Rev. Lett.* **119**, 040501 (2017). ArXiv:1607.08560.
9. Rui Li, Unai Alvarez-Rodriguez, Lucas Lamata, and Enrique Solano. *Approximate Quantum Adders with Genetic Algorithms: An IBM Quantum Experience*. *Quantum Meas. Quantum Metrol.* **4**, 1 (2017). ArXiv:1611.07851.
This article is a combination of theoretical proposal and its experimental implementation in the 5-transmon quantum computer provided by the facilities of IBM Quantum Experience.
10. Lucas Lamata. *Basic protocols in quantum reinforcement learning with superconducting circuits*. *Sci. Rep.* **7**, 1609 (2017). ArXiv:1701.05131.
11. Richard L. Taylor, Christopher D. B. Bentley, Julien S. Pedernales, Lucas Lamata, Enrique Solano, André R. R. Carvalho, and Joseph J. Hope. *A Study on Fast Gates for Large-Scale Quantum Simulation with Trapped Ions*. *Sci. Rep.* **7**, 46197 (2017). ArXiv:1601.00359.
12. Jie Peng, Chenxiang Zheng, Guangjie Guo, Xiaoyong Guo, Xin Zhang, Chaosheng Deng, Guoxing Ju, Zhongzhou Ren, Lucas Lamata, and Enrique Solano. *Dark-like states for the multi-qubit and multi-photon Rabi models*. *J. Phys. A* **50**, 174003 (2017). ArXiv:1610.04949.
13. Lucas Lamata. *Digital-analog quantum simulation of generalized Dicke models with superconducting circuits*. *Sci. Rep.* **7**, 43768 (2017). ArXiv:1608.08025.
14. Unai Alvarez-Rodriguez, Armando Perez-Leija, Iñigo L. Egusquiza, Markus Gräfe, Mikel Sanz, Lucas Lamata, Alexander Szameit, and Enrique Solano. *Advanced-Retarded Differential Equations in Quantum Photonic Systems*. *Sci. Rep.* **7**, 42933 (2017). ArXiv:1606.05143.
15. Xue-Ke Song, Fu-Guo Deng, Lucas Lamata, and J. G. Muga. *Robust state preparation in quantum simulations of Dirac dynamics*. *Phys. Rev. A* **95**, 022332 (2017). ArXiv:1612.03033.
16. Xiao-Hang Cheng, Iñigo Arrazola, Julien S. Pedernales, Lucas Lamata, Xi Chen, and Enrique Solano. *Switchable particle statistics with an embedding quantum simulator*. *Phys. Rev. A* **95**, 022305 (2017). ArXiv:1606.04339.
17. Juha M. Kreula, Laura García-Álvarez, Lucas Lamata, Stephen R. Clark, Enrique Solano, and Dieter Jaksch. *Few-qubit quantum-classical simulation of strongly correlated lattice fermions*. *EPJ Quantum Technology* **3**, 11 (2016). ArXiv:1606.04839.

18. I. Arrazola, J. S. Pedernales, L. Lamata, and E. Solano. *Digital-Analog Quantum Simulation of Spin Models in Trapped Ions*. *Sci. Rep.* **6**, 30534 (2016). ArXiv:1602.06248.
19. M. Sanz, I. L. Egusquiza, R. Di Candia, H. Saberi, L. Lamata, and E. Solano, *Entanglement classification with matrix product states*. *Sci. Rep.* **6**, 30188 (2016). ArXiv:1504.07524.
20. L. García-Álvarez, U. Las Heras, A. Mezzacapo, M. Sanz, E. Solano, and L. Lamata. *Quantum chemistry and charge transport in biomolecules with superconducting circuits*. *Sci. Rep.* **6**, 27836 (2016). ArXiv:1511.09355.
21. R. Barends, A. Shabani, L. Lamata, J. Kelly, A. Mezzacapo, U. Las Heras, R. Babbush, A. G. Fowler, B. Campbell, Yu Chen, Z. Chen, B. Chiaro, A. Dunsworth, E. Jeffrey, E. Lucero, A. Megrant, J. Y. Mutus, M. Neeley, C. Neill, P. J. J. O'Malley, C. Quintana, P. Roushan, D. Sank, A. Vainsencher, J. Wenner, T. C. White, E. Solano, H. Neven, and John M. Martinis. *Digitized adiabatic quantum computing with a superconducting circuit*. *Nature* **534**, 222 (2016). ArXiv:1511.03316. Highlighted in Google Research Blog, Nature News, MIT Technology Review, Scientific American, PhysOrg, PC World, IOP Physics World, EL PAIS, ABC, AIP Inside Science, and Wired, among more than 40 news articles.
[According to Nature Index](#), this article was among the 5 published in the University of the Basque Country during August 2015-July 2016 with largest Altmetrics (with 312).
22. U. Alvarez-Rodriguez, M. Sanz, L. Lamata, and E. Solano. *Artificial Life in Quantum Technologies*. *Sci. Rep.* **6**, 20956 (2016). ArXiv:1505.03775. Highlighted in MIT Technology Review, the Press Office from UPV/EHU, Catalunya Vanguardista, La Tribuna del País Vasco, Notinet.org, Salud en tu vida, Physics4TheCool, Ikerbasque, Scientific American, El Correo, and El Mundo.
23. A. Mezzacapo, E. Rico, C. Sabín, I. L. Egusquiza, L. Lamata, and E. Solano. *Non-Abelian $SU(2)$ Lattice Gauge Theories in Superconducting Circuits*. *Phys. Rev. Lett.* **115**, 240502 (2015). ArXiv:1505.04720.
24. J. S. Pedernales, I. Lizuain, S. Felicetti, G. Romero, L. Lamata, and E. Solano, *Quantum Rabi Model with Trapped Ions*. *Sci. Rep.* **5**, 15472 (2015). ArXiv:1505.00698.
This theoretical proposal was realized in a preliminary experiment in the trapped-ion group of Prof. Kihwan Kim at Tsinghua University, Beijing, China, and presented at the 17th Asian Quantum Information Science Conference: AQIS2017.
25. Tony E. Lee, Unai Alvarez-Rodriguez, Xiao-Hang Cheng, Lucas Lamata, and Enrique Solano, *Tachyon physics with trapped ions*. *Phys. Rev. A* **92**, 032129 (2015). ArXiv:1503.06802.

26. S. Felicetti, J. S. Pedernales, I. L. Egusquiza, G. Romero, L. Lamata, D. Braak, and E. Solano. *Spectral collapse via two-phonon interactions in trapped ions*. *Phys. Rev. A* **92**, 033817 (2015). ArXiv:1506.00493.
27. Xiao-Hang Cheng, Unai Alvarez-Rodriguez, Lucas Lamata, Xi Chen, and Enrique Solano, *Time and spatial parity operations with trapped ions*. *Phys. Rev. A* **92**, 022344 (2015). ArXiv:1501.07836.
28. A. Mezzacapo, M. Sanz, L. Lamata, I. L. Egusquiza, S. Succi, and E. Solano, *Quantum Simulator for Transport Phenomena in Fluid Flows*. *Sci. Rep.* **5**, 13153 (2015). ArXiv:1502.00515.
29. Xiang Zhang, Yangchao Shen, Junhua Zhang, Jorge Casanova, Lucas Lamata, Enrique Solano, Man-Hong Yung, Jing-Ning Zhang, and Kihwan Kim. *Time reversal and charge conjugation in an embedding quantum simulator*. *Nature Commun.* **6**, 7917 (2015). ArXiv:1409.3681. Highlighted in Tsinghua University Dean’s Vision Media Section, the Press Office from UPV/EHU, Europa Press, 100TEK, Tendencias21, La Razón, Cultura Científica, Science Daily, Phys Org, Demanjo, Eurekalert, Tech Times, Space Daily, Sabías.es, R&D, Brightsurf, and Catalunya Vanguardista.
30. S. Felicetti, C. Sabín, I. Fuentes, L. Lamata, G. Romero, and E. Solano, *Relativistic motion with superconducting qubits*. *Phys. Rev. B* **92**, 064501 (2015). ArXiv:1503.06653.
31. Ivan Fernandez-Corbaton, Mauro Cirio, Alexander Büse, Lucas Lamata, Enrique Solano, and Gabriel Molina-Terriza. *Quantum Emulation of Gravitational Waves*. *Sci. Rep.* **5**, 11538 (2015). ArXiv:1406.4263.
32. R. Barends, L. Lamata, J. Kelly, L. García-Álvarez, A. G. Fowler, A. Megrant, E. Jeffrey, T. C. White, D. Sank, J. Y. Mutus, B. Campbell, Yu Chen, Z. Chen, B. Chiaro, A. Dunsworth, I.-C. Hoi, C. Neill, P. J. J. O’Malley, C. Quintana, P. Roushan, A. Vainsencher, J. Wenner, E. Solano, and John M. Martinis. *Digital quantum simulation of fermionic models with a superconducting circuit*. *Nature Commun.* **6**, 7654 (2015). ArXiv:1501.07703. Highlighted in Google Research Blog, the Press Office from UPV/EHU, Noticias de la Ciencia y la Tecnología, ABC, El Mundo, El Correo, EFE Futuro, Universia, Ikerbasque, El Diario Vasco, and Deia.
33. U. Alvarez-Rodriguez, M. Sanz, L. Lamata, and E. Solano. *The Forbidden Quantum Adder*. *Sci. Rep.* **5**, 11983 (2015). ArXiv:1411.4534. Highlighted in MIT Technology Review.

The concepts of this theoretical paper were carried out in an experiment at the University of Science and Technology of China, Hefei, published in Xiao-Min Hu, Guang-Can Guo, Yong-Sheng Zhang, et al., *Phys. Rev. A* **94**, 033844 (2016), as well as an experiment at the Institute for Quantum Computing in Canada, published in Keren Li, Raymond Laflamme, et al., *Phys. Rev. A* **95**, 022334 (2017), and an experiment at TU Dortmund, published in Shruti Dogra, Dieter Suter, et al., ArXiv:1702.02418.

34. Y. Salathé, M. Mondal, M. Oppliger, J. Heinsoo, P. Kurpiers, A. Potocnik, A. Mezzacapo, U. Las Heras, L. Lamata, E. Solano, S. Filipp, and A. Wallraff, *Digital Quantum Simulation of Spin Models with Circuit Quantum Electrodynamics*. *Phys. Rev. X*, **5**, 021027 (2015). ArXiv:1502.06778.
35. Urtzi Las Heras, Laura García-Álvarez, Antonio Mezzacapo, Enrique Solano, and Lucas Lamata. *Fermionic models with superconducting circuits*. *EPJ Quantum Technology* **2**, 8 (2015). ArXiv:1411.2465.
This theoretical proposal was realized in an experiment in Prof. John Martinis group at Google and University of California Santa Barbara, published in R. Barends, et al., *Nature Commun.* **6**, 7654 (2015).
36. L. García-Álvarez, J. Casanova, A. Mezzacapo, I. L. Egusquiza, L. Lamata, G. Romero, and E. Solano. *Fermion-Fermion Scattering in Quantum Field Theory with Superconducting Circuits*. *Phys. Rev. Lett.* **114**, 070502 (2015). ArXiv:1404.2868.
37. A. Mezzacapo, U. Las Heras, J. S. Pedernales, L. DiCarlo, E. Solano, and L. Lamata. *Digital Quantum Rabi and Dicke Models in Superconducting Circuits*. *Sci. Rep.* **4**, 7482 (2014). ArXiv:1405.5814.
This theoretical proposal was realized in an experiment in Prof. Leonardo DiCarlo group at Delft University of Technology, Netherlands, published in N. K. Langford, et al., arXiv:1610.10065.
38. S. Felicetti, M. Sanz, L. Lamata, G. Romero, G. Johansson, P. Delsing, and E. Solano. *Dynamical Casimir Effect Entangles Artificial Atoms*. *Phys. Rev. Lett.* **113**, 093602 (2014). ArXiv:1402.4451. Highlighted in the Image Gallery of APS March Meeting 2014, in Naukas, and in Taringa.
39. A. Mezzacapo, L. Lamata, S. Filipp, and E. Solano. *Many-Body Interactions with Tunable-Coupling Transmon Qubits*. *Phys. Rev. Lett.* **113**, 050501 (2014). ArXiv:1403.3652.
40. Lucas Lamata, Antonio Mezzacapo, Jorge Casanova, and Enrique Solano. *Efficient quantum simulation of fermionic and bosonic models in trapped ions*. *EPJ Quantum Technology* **1**, 9 (2014). ArXiv:1312.2849.
41. U. Las Heras, A. Mezzacapo, L. Lamata, S. Filipp, A. Wallraff, and E. Solano. *Digital Quantum Simulation of Spin Systems in Superconducting Circuits*. *Phys. Rev. Lett.* **112**, 200501 (2014). ArXiv:1311.7626.
This theoretical proposal was realized in an experiment at ETH Zurich, in Prof. Andreas Wallraff group, published in Y. Salathé *et al.*, *Digital Quantum Simulation of Spin Models with Circuit Quantum Electrodynamics*, *Phys. Rev. X* **5**, 021027 (2015).
42. U. Alvarez-Rodriguez, M. Sanz, L. Lamata, and E. Solano. *Biomimetic Cloning of Quantum Observables*. *Sci. Rep.* **4**, 4910 (2014). ArXiv:1312.3559.

43. M.-H. Yung, J. Casanova, A. Mezzacapo, J. McClean, L. Lamata, A. Aspuru-Guzik, and E. Solano. *From transistor to trapped-ion computers for quantum chemistry*. *Sci. Rep.* **4**, 3589 (2014). Highlighted in MIT Technology Review, PhysOrg, ScienceDaily, Nanowerk, and Naukas. ArXiv:1307.4326.
This theoretical proposal was realized in an experiment in the Tsinghua University trapped-ion group of Prof. Kihwan Kim, published in Yangchao Shen, Man Hong Yung, Kihwan Kim, *et al.*, *Quantum implementation of unitary coupled cluster for simulating molecular electronic structure*, *Phys. Rev. A* **95**, 020501(R) (2017).
44. U. Alvarez-Rodriguez, J. Casanova, L. Lamata, and E. Solano. *Quantum Simulation of Noncausal Kinematic Transformations*. *Phys. Rev. Lett.* **111**, 090503 (2013). Highlighted in Materia, the Bulletin of the Royal Spanish Physical Society, La Razón, and RTVE.es. ArXiv:1305.0506
45. L. Lamata, C. E. López, B. P. Lanyon, T. Bastin, J. C. Retamal, and E. Solano. *Deterministic generation of arbitrary symmetric states and entanglement classes*. *Phys. Rev. A* **87**, 032325 (2013). ArXiv:1211.0404
46. A. Mezzacapo, J. Casanova, L. Lamata, and E. Solano. *Topological qubits with Majorana fermions in trapped ions*. *New J. Phys.* **15**, 033005 (2013). ArXiv:1111.5603
47. A. Mezzacapo, J. Casanova, L. Lamata, and E. Solano. *Digital Quantum Simulation of the Holstein Model in Trapped Ions*. *Phys. Rev. Lett.* **109**, 200501 (2012). ArXiv:1207.2664
48. J. Casanova, A. Mezzacapo, L. Lamata, and E. Solano. *Quantum Simulation of Interacting Fermion Lattice Models in Trapped Ions*. *Phys. Rev. Lett.* **108**, 190502 (2012). ArXiv:1110.3730
49. C. Sabín, J. Casanova, J. J. García-Ripoll, L. Lamata, E. Solano, and J. León. *Encoding relativistic potential dynamics into free evolution*. *Phys. Rev. A* **85**, 052301 (2012). ArXiv:1203.4136
50. L. Lamata, J. Casanova, I. L. Egusquiza, and E. Solano. *The nonrelativistic limit of the Majorana equation and its simulation in trapped ions*. *Phys. Scr.* **T147**, 014017 (2012). ArXiv:1109.0957
This theoretical proposal was realized in an experiment in the Tsinghua University trapped-ion group of Prof. Kihwan Kim, published in Xiang Zhang *et al.*, *Time reversal and charge conjugation in an embedding quantum simulator*, *Nature Commun.* **6**, 7917 (2015).
51. J. Casanova, L. Lamata, I. L. Egusquiza, R. Gerritsma, C. F. Roos, J. J. Garcia-Ripoll, and E. Solano. *Quantum Simulation of Quantum Field Theories in Trapped Ions*. *Phys. Rev. Lett.* **107**, 260501 (2011). ArXiv:1107.5233

This theoretical proposal was realized in an experiment in the Tsinghua University trapped-ion group of Prof. Kihwan Kim, published in Xiang Zhang *et al.*, *Fermion-antifermion scattering via boson exchange in a trapped ion*. ArXiv:1611.00099.

52. L. Lamata, J. Casanova, R. Gerritsma, C. F. Roos, J. J. Garcia-Ripoll, and E. Solano. *Relativistic quantum mechanics with trapped ions*. [New J. Phys.](#) **13**, 095003 (2011). ArXiv:1106.6222
53. L. Lamata, D. R. Leibbrandt, I. L. Chuang, J. I. Cirac, M. D. Lukin, V. Vuletić, and S. F. Yelin. *Ion Crystal Transducer for Strong Coupling between Single Ions and Single Photons*. [Phys. Rev. Lett.](#) **107**, 030501 (2011). ArXiv:1102.4141.

Related experiments to this proposal:

i) Experiment performed at the Massachusetts Institute of Technology: M. Cetina, I. Chuang, V. Vuletić, *et al.*, *One-dimensional array of ion chains coupled to an optical cavity*, *New J. Phys.* **15**, 053001 (2013).

ii) Two experiments performed at the Innsbruck trapped ion group:

B. Casabone, R. Blatt, T. E. Northup, *et al.*, *Heralded Entanglement of Two Ions in an Optical Cavity*, *Phys. Rev. Lett.* **111**, 100505 (2013). Selected as Editor's Suggestion, and

B. Casabone, R. Blatt, T. E. Northup, *et al.*, *Enhanced Quantum Interface with Collective Ion-Cavity Coupling*, *Phys. Rev. Lett.* **114**, 023602 (2015). Selected as Editor's Suggestion and featured in *Physics*.

See also the [PhD Thesis of Bernardo Casabone](#), Universität Innsbruck, including a complete analysis of the proposal's experimental realization.

54. P. Mathonet, S. Krins, M. Godefroid, L. Lamata, E. Solano, and T. Bastin. *Entanglement equivalence of N -qubit symmetric states*. [Phys. Rev. A](#) **81**, 052315 (2010). ArXiv:0908.0886
55. L. Lamata, D. Porras, J.I. Cirac, J. Goldman, and G. Gabrielse. *Towards electron-electron entanglement in Penning traps*. [Phys. Rev. A](#) **81**, 022301 (2010). Highlighted in *Science News*. ArXiv:0905.0644
56. Hamed Saberi, Andreas Weichselbaum, Lucas Lamata, David Pérez-García, Jan von Delft, and Enrique Solano. *Constrained optimization of sequentially generated entangled multiqubit states*. [Phys. Rev. A](#) **80**, 022334 (2009). ArXiv:0810.0977
57. T. Bastin, S. Krins, P. Mathonet, M. Godefroid, L. Lamata, and E. Solano. *Operational Families of Entanglement Classes for Symmetric N -Qubit States*. [Phys. Rev. Lett.](#) **103**, 070503 (2009). ArXiv:0902.3230
58. T. Bastin, C. Thiel, J. von Zanthier, L. Lamata, E. Solano, and G. S. Agarwal. *Operational Determination of Multiqubit Entanglement Classes*

via Tuning of Local Operations. *Phys. Rev. Lett.* **102**, 053601 (2009).
ArXiv:0710.3720

59. L. Lamata, J. León, D. Pérez-García, D. Salgado, and E. Solano. *Sequential Implementation of Global Quantum Operations.* *Phys. Rev. Lett.* **101**, 180506 (2008). Highlighted in Ecuador Ciencia and Basque Research. ArXiv:0711.3652
60. L. Lamata, J. León, T. Schätz, and E. Solano. *Dirac Equation and Quantum Relativistic Effects in a Single Trapped Ion.* *Phys. Rev. Lett.* **98**, 253005 (2007). Selected as a Suggestion by the PRL Editors. Highlighted in Pro-Physik.de. ArXiv: quant-ph/0701208.

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61. Y. Delgado, L. Lamata, J. León, D. Salgado, and E. Solano. *Sequential Quantum Cloning.* *Phys. Rev. Lett.* **98**, 150502 (2007). ArXiv: quant-ph/0607105.
62. L. Lamata, J. León, D. Salgado, and E. Solano. *Inductive entanglement classification of four qubits under stochastic local operations and classical communication.* *Phys. Rev. A.* **75**, 022318 (2007). ArXiv: quant-ph/0610233.
63. L. Lamata, J. J. García-Ripoll, and J. I. Cirac *How Much Entanglement Can Be Generated between Two Atoms by Detecting Photons?* *Phys. Rev. Lett.* **98**, 010502 (2007). Selected as a Suggestion by the PRL Editors (1st Suggestion of PRL history, in appearance order). Highlighted in *Nature Photonics* and in *PhysOrg.com*. ArXiv: quant-ph/0608158.
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65. L. Lamata, J. León, D. Salgado, and E. Solano. *Inductive classification of multipartite entanglement under stochastic local operations and classical communication.* *Phys. Rev. A.* **74**, 052336 (2006). ArXiv: quant-ph/0603243.
66. Lucas Lamata, Juan León, and David Salgado. *Spin entanglement loss by local correlation transfer to the momentum.* *Phys. Rev. A* **73**, 052325 (2006). ArXiv: quant-ph/0603225.

67. Lucas Lamata and Juan León. *Generation of bipartite spin entanglement via spin-independent scattering*. *Phys. Rev. A* **73**, 052322 (2006). ArXiv: quant-ph/0602090.
68. L. Lamata, J. León, and E. Solano. *Dynamics of momentum entanglement in lowest-order QED*. *Phys. Rev. A* **73**, 012335 (2006). ArXiv: quant-ph/0509021.
69. Lucas Lamata and Juan León. *A time representation*. *Concepts Phys.* **2**, 49 (2005). ArXiv: quant-ph/0505141.
70. Lucas Lamata and Juan León. *Dealing with entanglement of continuous variables: Schmidt decomposition with discrete sets of orthogonal functions*. *J. Opt. B: Quantum Semiclass. Opt.* **7**, 224 (2005). ArXiv: quant-ph/0410167.

Books and book chapters

71. Guillermo Romero, Enrique Solano, and Lucas Lamata, *Quantum simulations with circuit quantum electrodynamics*, chapter in the edited volume on “[Quantum Simulations with Photons and Polaritons](#)” D.G. Angelakis (ed.) (Springer, 2017). ISBN: 978-3-319-52025-4. ArXiv:1606.01755.
72. U. Las Heras, L. García-Álvarez, A. Mezzacapo, E. Solano and L. Lamata, *Quantum Simulation of Spin Chains Coupled to Bosonic Modes with Superconducting Circuits*, in R. S. Anderssen et al. (eds.), [Applications + Practical Conceptualization + Mathematics = fruitful Innovation, Mathematics for Industry 11](#) (Springer Japan, 2015). ISBN: 978-4-431-55341-0. ArXiv:1507.02553.
73. PhD Thesis, Universidad Autónoma de Madrid, April 2007. Lucas Lamata. *Developments in entanglement theory and applications to relevant physical systems*. Servicio de Publicaciones de la Universidad Autónoma de Madrid. ISBN: 978-84-8344-068-1. ArXiv: 0704.3907v1 [quant-ph].

Proceedings and abstracts

74. Dingshun Lv, Shuoming An, Zhenyu Liu, J. N. Zhang, Julen S. Pedernales, Lucas Lamata, Enrique Solano, and Kihwan Kim. *Quantum simulation of the quantum Rabi model in a single trapped ion*. Proceedings of the 17th Asian Quantum Information Science Conference: AQIS2017, pp. 575-576.
75. Shuaining Zhang, Yangchao Shen, Yao Lu, Kuan Zhang, Jing-Ning Zhang, Kihwan Kim, J. S. Pedernales, Lucas Lamata, Enrique Solano, and J. Casanova. *Experimental measurement of correlation functions in trapped ions*. APS DAMOP Meeting, Sacramento, California, US, 2017 (Meeting Abstract). C8.00009.

76. L. Lamata. *Digital-analog quantum simulation of generalized Dicke models with superconducting circuits*. APS March Meeting, New Orleans, Louisiana, US, 2017 (Meeting Abstract). H42.00005.
77. L. Lamata, R. Barends, A. Shabani, J. Kelly, A. Mezzacapo, U. Las Heras, R. Babbush, A. G. Fowler, B. Campbell, Yu Chen, Z. Chen, B. Chiaro, A. Dunsworth, E. Jeffrey, E. Lucero, A. Megrant, J. Mutus, M. Neeley, C. Neill, P. O'Malley, C. Quintana, P. Roushan, E. Solano, H. Neven, and John M. Martinis. *Digitized adiabatic quantum computing with a superconducting circuit, part I: Theory*. APS March Meeting, Baltimore, Maryland, US, 2016 (Meeting Abstract). A48.0001.
- 2 days before the beginning of the APS March Meeting 2016, this abstract [was ranked by APS](#) as the top-scheduled contributed talk and the 20th one including invited talks (the first 19 were invited), out of more than 9,000 abstracts, with 117 schedules. Attendants to the March Meeting have the possibility to use a web interface to schedule talks in the Meeting, and APS establishes a ranking by the total amount of schedules for each talk.
78. R. Barends, A. Shabani, L. Lamata, J. Kelly, A. Mezzacapo, U. Las Heras, R. Babbush, A. G. Fowler, B. Campbell, Yu Chen, Z. Chen, B. Chiaro, A. Dunsworth, E. Jeffrey, E. Lucero, A. Megrant, J. Mutus, M. Neeley, C. Neill, P. O'Malley, C. Quintana, P. Roushan, E. Solano, H. Neven, and John M. Martinis. *Digitized adiabatic quantum computing with a superconducting circuit, part II: Experiment*. APS March Meeting, Baltimore, Maryland, US, 2016 (Meeting Abstract). A48.0002
79. Urtzi Las Heras, Laura García-Álvarez, Lucas Lamata, and Enrique Solano. *Digital quantum simulations with superconducting circuits*. APS March Meeting, Baltimore, Maryland, US, 2016 (Meeting Abstract). A48.0003
80. Julen Pedernales, Urtzi Las Heras, Lucas Lamata, and Enrique Solano. *Quantum Rabi Model in Quantum Technologies*. APS March Meeting, Baltimore, Maryland, US, 2016 (Meeting Abstract). S45.00001
81. Shuaining Zhang, Yangchao Shen, Jin-Ning Zhang, Man-Hong Yung, J.S. Pedernales, Lucas Lamata, J. Casanova, Enrique Solano, and Kihwan Kim. *Experimental measurement of n -time correlation functions in a trapped ion*. APS DAMOP Meeting, Columbus, Ohio, US, 2015 (Meeting Abstract). Q1.00085
82. Xiang Zhang, Kuan Zhang, Yangchao Shen, Jingning Zhang, Man-Hong Yung, Kihwan Kim, Julen Pedernales, Lucas Lamata, Enrique Solano, and Jorge Casanova. *Quantum Simulation of Quantum Field Theory with a Trapped Ion System*. APS DAMOP Meeting, Columbus, Ohio, US, 2015 (Meeting Abstract). Q1.00076
83. Tony Lee, Unai Alvarez-Rodriguez, Xiao-Hang Cheng, Lucas Lamata, Rajibul Islam, and Enrique Solano. *Quantum simulation of Dirac tachyons*

- with trapped ions via quantum measurement.* APS DAMOP Meeting, Columbus, Ohio, US, 2015 (Meeting Abstract). B7.00010
84. M. Oppliger, Y. Salathe, M. Mondal, J. Heinsoo, P. Kurpiers, A. Potocnik, S. Filipp, A. Wallraff, A. Mezzacapo, U. Las Heras, L. Lamata, and E. Solano. *Digital Quantum Simulation of Heisenberg Spin Systems in Circuit QED.* APS March Meeting, San Antonio, Texas, US, 2015 (Meeting Abstract). H1.00101
 85. Lucas Lamata. *Quantum Simulations with Trapped Ions and Superconducting Circuits.* Forum “Math-for-Industry” 2014, MI Lecture Note Vol. 57, Kyushu University, pp. 54. **ISSN:** 2188-1200.
 86. Lucas Lamata. *Quantum Simulations with Trapped Ions and Superconducting Circuits.* 23rd Congress of the International Commission for Optics, ICO 23, 2014, Ref. Quantum_Opt_130_187.
 87. Shen Yangchao, Xiang Zhang, Junhua Zhang, Jorge Casanova, Lucas Lamata, Enrique Solano, Man-Hong Yung, Jingning Zhang, and Kihwan Kim. *Digital quantum simulation of Dirac equation with a trapped ion.* APS DAMOP Meeting, Madison, Wisconsin, US, 2014 (Meeting Abstract). Q1.00080
 88. Xiang Zhang, Shen Yangchao, Junhua Zhang, Jorge Casanova, Lucas Lamata, Enrique Solano, Man-Hong Yung, Jingning Zhang, and Kihwan Kim. *Quantum Simulation of the Majorana Equation with a Trapped Ion.* APS DAMOP Meeting, Madison, Wisconsin, US, 2014 (Meeting Abstract). J4.00008
 89. G. Romero, L. García-Álvarez, J. Casanova, A. Mezzacapo, L. Lamata, and E. Solano. *Simulating quantum field theories with superconducting circuits.* APS March Meeting, Denver, Colorado, US, 2014 (Meeting Abstract). D35.00007
 90. Y. Salathe, M. Mondal, P. Kurpiers, M. Oppliger, L. Steffen, S. Filipp, A. Wallraff, A. Mezzacapo, U. Las Heras, L. Lamata, and E. Solano. *Digital Quantum Simulation of Heisenberg Spin-Spin Interactions with Superconducting Qubits.* APS March Meeting, Denver, Colorado, US, 2014 (Meeting Abstract). D35.00008
 91. S. Felicetti, M. Sanz, L. Lamata, G. Romero, G. Johansson, P. Delsing, and E. Solano. *The dynamical Casimir effect generates entanglement.* APS March Meeting, Denver, Colorado, US, 2014 (Meeting Abstract). J28.00011
 92. L. Lamata. *Quantum Simulations with Trapped Ions and Superconducting Qubits.* 3rd Bonn Humboldt Award Winners’ Forum “Frontiers in Quantum Optics: Taming the World of Atoms and Photons-100 Years after Niels Bohr”, pp. 121-122.

93. L. Lamata. *Quantum Simulation of Fermions and Bosons with Trapped Ions*. Workshop on Quantum Applications with Trapped Ions, and Topical Group Discussion “Scalable Trapped Ion Quantum Systems”, ITAMP, Harvard-Smithsonian Center for Astrophysics, Cambridge, US. p. 31 (Meeting Abstract).
94. A. Mezzacapo, J. Casanova, L. Lamata, and E. Solano. *Digital Quantum Simulation of the Holstein Model in Trapped Ions*. XXXIV Reunión Bienal de la Real Sociedad Española de Física, Valencia, 2013. pp. 406-407.
95. L. Lamata, D. R. Leibbrandt, I. L. Chuang, J. I. Cirac, M. D. Lukin, V. Vuletic, and S. F. Yelin. *Ion crystal transducer for strong coupling between single ions and single photons*. XXXIII Reunión Bienal de la Real Sociedad Española de Física, Santander, 2011. pp. 197-198. **ISBN:** 978-84-86116-40-8
96. L. Lamata, D. R. Leibbrandt, I. L. Chuang, J. I. Cirac, M. D. Lukin, V. Vuletic, and S. F. Yelin. *Ion crystal transducer for strong coupling between single ions and single photons*. APS March Meeting, Dallas, Texas, US, 2011 (Meeting Abstract). B29.00005
97. L. Lamata, J. León, D. Pérez-García, D. Salgado, and E. Solano. *On the impossibility to perform a global unitary operation sequentially*. CLEO/Europe-European Quantum Electronics Conference, Munich, Germany, 2009. **ISBN:** 978-1-4244-4080-1
98. T. Bastin, C. Thiel, J. von Zanthier, L. Lamata, E. Solano, and G. S. Agarwal. *Operational Monitoring of Multi-Qubit Entanglement Classes via Tuning of Local Operations*. International Conference on Quantum Information, (Optical Society of America, 2008), paper JMB48.
99. Lucas Lamata. *Quantum Information Implementations: Quantum Simulations with Atoms and Ions, Hybrid Quantum Computation, and Topological Quantum Computation*. Network Meeting of Humboldtians, organized by the Alexander von Humboldt Foundation, Marburg, Germany, 2008. p. 44. **ISSN:** 1864-824X
100. L. Lamata, J. J. Garcia-Ripoll, and J. I. Cirac. *¿Cuánto entrelazamiento puede generarse entre dos átomos midiendo fotones?*. XXXI Reunión Bienal de la Real Sociedad Española de Física, Granada, 2007. p. 289.
101. Lucas Lamata, Juan León, Tobias Schatz, and Enrique Solano. *Simulación de efectos cuánticos relativistas en un ión atrapado*. XXXI Reunión Bienal de la Real Sociedad Española de Física, Granada, 2007. p. 293.
102. Lucas Lamata and Juan León. *Evolución temporal de entrelazamiento bipartito en sistemas inestables*. XXX Reunión Bienal de la Real Sociedad Española de Física, Ourense, 2005. pp. 654-655. **ISBN:** 84-689-3266-3

103. Lucas Lamata and Juan León. *Entrelazamiento en sistemas con variables continuas: Descomposición de Schmidt con conjuntos numerables de funciones ortonormales*. XXX Reunión Bienal de la Real Sociedad Española de Física, Ourense, 2005. pp. 656-657. **ISBN:** 84-689-3266-3
104. Lucas Lamata and Juan León. *Time of arrival with resonances: Beyond scattering states*. CFIF Workshop: “Time asymmetric quantum theory: The theory of resonances”, Lisbon, 2003. ArXiv: quant-ph/0312034.

PARTICIPATION IN RESEARCH PROJECTS

1. **Title:** *Quantum Information with Quantum Technologies*.
Financing Organism: Spanish Ministry of Economy (MINECO).
Budget: 106,722 Euros.
Main Researchers: Lucas Lamata (PI) and Enrique Solano (Co-PI).
Participant Researchers: 9.
Period: 2016-2018.
2. **Title:** *Quantum Information, Science, and Technology (QuInST)*.
Financing Organism: Basque Government.
Budget: 796,000 Euros.
Main Researcher: Gonzalo Muga (PI) and Lucas Lamata (manager).
Period: 2016-2021.
3. **Title:** *Red de Información y Tecnologías Cuánticas en España (RITCE)*.
Character: Excellence Network.
Financing Organism: Spanish Ministry of Economy (MINECO).
Budget: 30,000 Euros.
Main Researcher: Dr. Juan José García-Ripoll.
Period: 2017-2018.
4. **Title:** *Support from the IQC for the Workshop Ultra-strong light-matter interactions*.
Character: Economic support for this Workshop organization.
Financing Organism: Institute for Quantum Computing, Waterloo, Canada.
Budget: 8,000 CAD (about 5,400 Euros).
Organizing Committees: International: M. Batchelor (Co-Chair), D. Braak, Q.-H. Chen, E. Solano (Chair), C. Wilson. Local: I. L. Egusquiza, L. Lamata (Co-Chair), E. Rico (Chair), and M. Sanz.
Period: 2016.
5. **Title:** *Support from the Basque Government for the Workshop Ultra-strong light-matter interactions*.
Character: Economic support for this Workshop organization.

Financing Organism: Basque Government.

Budget: 3,000 Euros.

Organizing Committees: International: M. Batchelor (Co-Chair), D. Braak, Q.-H. Chen, E. Solano (Chair), C. Wilson. Local: I. L. Egusquiza, L. Lamata (Co-Chair), E. Rico (Chair), and M. Sanz.

Period: 2016.

6. **Title:** *Support from the UPV/EHU for the Workshop Ultra-strong light-matter interactions.*

Character: Economic support for this Workshop organization.

Financing Organism: University of the Basque Country, Bilbao, Spain.

Budget: 4,000 Euros.

Organizing Committees: International: M. Batchelor (Co-Chair), D. Braak, Q.-H. Chen, E. Solano (Chair), C. Wilson. Local: I. L. Egusquiza, L. Lamata (Co-Chair), E. Rico (Chair), and M. Sanz.

Period: 2016.

7. **Title:** *Quantum Simulations with Superconducting Circuits.*

Character: Alexander von Humboldt Foundation Short Stay Grant.

Financing Organism: Humboldt Foundation, Bonn, Germany.

Budget: Daily allowance for a short scientific visit to the Walther-Meißner Institute, Garching, Germany.

Main Researcher: Dr. Lucas Lamata.

Period: 1-30 July, 2015.

8. **Title:** *Quantum Simulations with Ions and Superconducting Circuits.*

Character: UPV/EHU Research Project.

Financing Organism: University of the Basque Country UPV/EHU.

Budget: 3,040 Euros (maximum possible: 4,000 Euros).

Main Researcher: Dr. Lucas Lamata.

Period: 2014-2016.

9. **Character:** Ramón y Cajal Grant.

Financing Organism: Spanish Ministry of Economy (MINECO).

Budget: 170,000 Euros (salary), 40,000 Euros (research expenses), and 100,000 Euros economic support to the Host Institution (University of the Basque Country) at the end of the Grant for giving tenure to the Ramón y Cajal Fellow. Total: 310,000 Euros.

Main Researcher: Dr. Lucas Lamata.

Period: 2013-2018.

10. **Title:** *Red de Información Cuántica en España (RICE).*

Character: Excellence Network.

Financing Organism: Spanish Ministry of Economy (MINECO).

Budget: 24,981 Euros.

Main Researcher: Prof. Juan León.

Period: 2015-2016.

11. **Title:** *Scalable Superconducting Processors for Entangled Quantum Information Technology* (SCALEQIT).
Character: FP7 EU Integrated Project.
Financing Organism: European Commission.
Budget: 300,000 Euros.
Main Researcher: Prof. Göran Wendin (coordinator) (Chalmers), Prof. Per Delsing (Chalmers), Prof. Leonardo DiCarlo (TU Delft), Prof. Andreas Wallraff (ETH Zürich), Prof. Daniel Esteve (CEA Saclay), Prof. David DiVincenzo (RWTH Aachen), Prof. Frank Wilhelm (Universität des Saarlandes), Prof. Enrique Solano (UPV/EHU Bilbao).²
Period: 2013-2016.
12. **Title:** *Circuit Quantum Electrodynamics*.
Financing Organism: Spanish Ministry of Economy (MINECO).
Budget: 41,000 Euros.
Main Researcher: Prof. Enrique Solano.
Period: 2013-2015.
13. **Title:** *Quantum Information, Science, and Technology* (QuInST).
Financing Organism: Basque Government.
Budget: 560,000 Euros.
Main Researcher: Prof. Juan Gonzalo Muga (PI), Prof. Eugene Sherman, and Prof. Enrique Solano.
Period: 2010-2015.
14. **Title:** *Quantum Simulations of Relativistic Systems* (QURELSIM).
Character: Marie Curie Intra-European Fellowship.
Financing Organism: European Commission.
Budget: 160,000 Euros.
Main Researcher: Dr. Lucas Lamata. (Host: Prof. Enrique Solano.)
Period: 2011-2013.
15. **Title:** *Quantum Information Technologies Madrid* (QUITEMAD).
Financing Organism: Comunidad de Madrid, Spain.
Main Researcher: Profs. Miguel Ángel Martín Delgado, Juan León, Alberto Ibort, Vicente Martín, David Pérez-García.
Participation: External researcher.
Period: 2010-2013.
16. **Title:** *Entrelazamiento: Fundamentos y Protocolos en Información Cuántica*.
Financing Organism: Ministry of Science and Innovation of Spain.
Budget: 25,000 Euros.
Main Researcher: Prof. Juan León.
Reference: FIS2008-05705/FIS.
Period: 2008-2010.

²Dr. Lucas Lamata has supported Prof. Solano in the SCALEQIT project, carrying out many tasks related to application, management, reporting, and performing all the evaluation presentations in Brussels of the Bilbao node.

17. **Title:** *Dinámica Cuántica en Dominios Finitos*.
Financing Organism: Ministry of Education and Science of Spain.
Budget: 14,000 Euros.
Main Researcher: Prof. Juan León.
Reference: FIS2005-05304.
Period: 2005-2007.
18. **Title:** *Entrelazamiento de Sistemas Cuánticos Bipartitos y Multipartitos*.
Financing Organism: CSIC (Ministry of Education and Science of Spain).
Budget: 12,000 Euros.
Main Researcher: Prof. Juan León.
Reference: 2004 5 0E 271.
Period: November 1st 2006-October 31st 2007.

FELLOWSHIPS

The total amount of funding I have achieved (individually) and enjoyed with the following Contracts and Fellowships (all of them in competitive European, German and Spanish calls) is of around 624,000 Euros. Including those Fellowships that I obtained, but I declined, because of having other Contracts, the total amount of funding I have achieved (individually) is of around 756,000 Euros.

1. **Type:** Ramón y Cajal Grant (2012 call)(BOE 4-Febrero-2014).
Financing Organism: Spanish Ministry of Economy (MINECO).
Place: Universidad del País Vasco, Bilbao, Spain.
Period: 5 years (2013-2018).
2. **Type:** Marie Curie Intra-European Fellowship.
Financing Organism: European Commission.
Place: Universidad del País Vasco, Bilbao, Spain.
Period: 24 months (May 1st 2011-April 30th 2013).
3. **Type:** Max-Planck Postdoctoral Fellowship.
Financing Organism: Max-Planck Society.
Place: Max-Planck Institute for Quantum Optics, Garching, Germany.
Period: 27 months (March 1st 2009-May 31st 2011).
4. **Type:** Humboldt Research Fellowship.
Financing Organism: Alexander von Humboldt Foundation, Bonn.
Place: Max-Planck Institute for Quantum Optics, Garching, Germany.
Period: 15 months (December 1st 2007-February 28th 2009).
5. **Type:** Spanish MEC Postdoctoral Fellowship (Awarded, not taken)(BOE 27-Agosto-2007).

- Financing Organism:** Ministry of Education and Science of Spain.
Place: Max-Planck Institute for Quantum Optics, Garching, Germany.
Period: 24 months (October 1st 2007-September 30th 2009).
6. **Type:** *Ramón Areces* Postdoctoral Fellowship (Awarded, not taken).
Financing Organism: Fundación Ramón Areces, Madrid, Spain.
Place: Max-Planck Institute for Quantum Optics, Garching, Germany.
Period: 12 months (October 1st 2007-September 30th 2008).
 7. **Type:** Contrato FPU (FPU PhD contract) (BOE 5-Marzo-2007).
Financing Organism: Ministry of Education and Science of Spain.
Place: Instituto de Matemáticas y Física Fundamental, CSIC, Madrid.
Period: 20 months (June 1st 2006-January 31st 2008).
 8. **Type:** FPU PhD scholarship (BOE 20-Enero-2004).
Financing Organism: Ministry of Education of Spain.
Place: Instituto de Matemáticas y Física Fundamental, CSIC, Madrid.
Period: 4 years (04-07).
 9. **Type:** Ayuda para estancias breves beca FPU (economic support for stays in foreign research institutions) (BOE 13-Julio-2006).
Financing Organism: Ministry of Education and Science of Spain.
Place: Max-Planck Institute for Quantum Optics, Garching, Germany.
Period: June 25th-August 26th 2006.
 10. **Type:** Ayuda para estancias breves beca FPU (economic support for stays in foreign research institutions) (BOE 17-Junio-2005).
Financing Organism: Ministry of Education and Science of Spain.
Place: Max-Planck Institute for Quantum Optics, Garching, Germany.
Period: July 1st-August 31st 2005.
 11. **Type:** I3P PhD scholarship (Awarded, not taken) (BOE 6-Febrero-2004).
Financing Organism: CSIC (Ministry of Science and Technology of Spain).
Place: Instituto de Matemáticas y Física Fundamental, CSIC, Madrid.
Period: 4 years (04-07).
 12. **Type:** Beca CSIC de Introducción a la Investigación último curso (undergraduate scholarship) (BOE 14-Abril-2003).
Financing Organism: CSIC (Ministry of Science and Technology of Spain).
Place: Instituto de Matemáticas y Física Fundamental, CSIC, Madrid.
Date: September-December, 2003.
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MENTORING AND SUPERVISION

OFFICIAL SUPERVISION

PhD Theses

1. **Student:** Julen Simon Pedernales.
Thesis title: Quantum Correlations of Light-Matter Interactions.
Defence date: 24 November 2016.
Mark: Sobresaliente *Cum Laude* and International Thesis Prize.
I was the official cosupervisor of the PhD student Mr. Julen S. Pedernales at the University of the Basque Country (together with Prof. Enrique Solano). Dr. Pedernales is currently a postdoctoral researcher at the University of Ulm, Germany.
Reference: [ArXiv:1611.09563](https://arxiv.org/abs/1611.09563).

Master Theses

1. **Student:** Ibai Aedo.
Thesis status: Ongoing (2016/2017).
I am the official supervisor of the Master student Ibai Aedo at the University of the Basque Country.

Bachelor Theses

1. **Student:** Iker Millan Irigoyen.
Thesis title: D-Wave Quantum Computer.
Defence date: 14 September 2016.
I was the official supervisor of the bachelor student Mr. Iker Millan Irigoyen at the University of the Basque Country (together with Prof. Enrique Solano).

DAY-TO-DAY (EXTRAOFFICIAL) SUPERVISION

For the following enumerated students, I was day-to-day supervisor, being Prof. Solano the official supervisor. In almost all of them I have joint publications.

1. I am currently co-supervising the PhD student Ms. Laura García-Álvarez at the University of the Basque Country (together with Prof. Enrique Solano). 7 joint papers (1 Nature Communications and 2 PRLs; see publication list). Period: July 2014-Today.
2. I am currently co-supervising the PhD student Ms. Xiao-Hang Cheng at the University of the Basque Country (together with Prof. Enrique Solano and Prof. Xi Chen), in the framework of a Bilbao-Shanghai University collaboration. 3 joint papers (see publication list). Period: September 2014-Today.
3. I am currently co-supervising the PhD student Mr. Iñigo Arrazola at the University of the Basque Country (together with Prof. Enrique Solano). 3 joint papers (see publication list). Period: September 2015-Today.

4. I co-supervised the PhD student Mr. Urtzi Las Heras at the University of the Basque Country (together with Prof. Enrique Solano). 7 joint papers (1 Nature, 1 PRX and 1 PRL; see publication list). Period: September 2013-May 2017. Thesis successfully defended on May 24th 2017.
5. I co-supervised the PhD student Mr. Unai Alvarez-Rodriguez at the University of the Basque Country (together with Prof. Enrique Solano). 9 joint papers included in his PhD Thesis (1 PRL and 3 Sci. Rep.; see publication list). Period: September 2012-November 2016. Thesis successfully defended on 14th November 2016. Dr. Alvarez-Rodriguez is currently a postdoctoral researcher at University of the Basque Country.
6. I co-supervised the PhD student Mr. Antonio Mezzacapo at the University of the Basque Country (together with Prof. Enrique Solano). 13 joint papers included in his PhD Thesis (1 PRX and 5 PRLs; see publication list). Period: September 2011-May 2015. Thesis successfully defended on 1st June 2015. Dr. Mezzacapo is currently a postdoctoral researcher at IBM T. J. Watson Research Center, Yorktown Heights, New York, US.
7. I co-supervised the PhD student Mr. Jorge Casanova at the University of the Basque Country (together with Prof. Enrique Solano). 10 joint papers included in his PhD Thesis (4 PRLs; see publication list). Period: May 2011-December 2012. Thesis successfully defended on 11th January 2013. Dr. Casanova was subsequently a Humboldt Fellow at Universität Ulm, Germany.
8. I co-supervised the master student Mr. Íñigo Arrazola at the University of the Basque Country (together with Prof. Enrique Solano and M. Sc. Julen Pedernales). 1 joint paper included in his Master Thesis (see publication list). Period: January-September 2015. Thesis successfully defended on 11th September 2015.
9. I co-supervised the master student Ms. Xiao-Hang Cheng at the University of the Basque Country (together with Prof. Enrique Solano and Prof. Xi Chen), in the framework of a Bilbao-Shanghai University collaboration. Period: March-June 2014.
10. I co-supervised the master student Mr. Urtzi Las Heras at the University of the Basque Country (together with Prof. Enrique Solano). 1 joint paper (PRL) included in his Master Thesis (see publication list). Period: January-September 2013. Thesis successfully defended on 6th September 2013.
11. I co-supervised the master student Mr. Unai Alvarez-Rodriguez at the University of the Basque Country (together with Prof. Enrique Solano). 1 joint paper (PRL) included in his Master Thesis (see publication list). Period: January-September 2012. Thesis successfully defended on 7th September 2012.

12. I co-supervised the bachelor student Mr. Urtzi Las Heras (for his Bachelor Thesis) at the University of the Basque Country (together with Prof. Enrique Solano). Period: January-June 2012. Thesis successfully defended on 13th July 2012.
13. I co-supervised the master student Mr. Diego Barberena, from Pontificia Universidad Católica del Perú, during a one-month visit to our group (together with Prof. Enrique Solano). Period: November 2016.
14. I co-supervised the senior undergraduate student Mr. Rui Li from Zhejiang University, China, during a one-month visit to our group (together with Prof. Enrique Solano and M. Sc. Unai Alvarez-Rodriguez). 1 joint paper (see publication list). Period: 15 May-14 June 2016.
15. I assisted in the supervision of PhD student Mr. Simone Felicetti, supervised by Prof. Enrique Solano and Dr. Guillermo Romero. 4 joint papers included in his PhD Thesis (1 PRL; see publication list). Period: Fall 2013-October 2015. Thesis successfully defended on 27th October 2015. Dr. Felicetti is currently a postdoctoral researcher at CNRS, Paris.
16. I assisted in the supervision of Mr. Hamed Saberi during his last months of PhD, while he was at the Ludwig-Maximilian University in Munich, supervised by Profs. Jan von Delft and Enrique Solano, and I was a post-doc at the nearby Max-Planck Institute for Quantum Optics in Garching. 1 joint paper (see publication list). Period: July-December 2008. Thesis successfully defended on 12th December 2008.

TEACHING EXPERIENCE

1. *Course on Quantum Optics and Quantum Information* in the Master of Quantum Science and Technology, at Universidad del País Vasco UPV/EHU, Bilbao, Spain (2016).
2. *Course on Quantum Technologies* in the Master of Quantum Science and Technology, at Universidad del País Vasco UPV/EHU, Bilbao, Spain (2015).
3. *Course on Quantum Optics and Quantum Information* in the Master of Quantum Science and Technology, at Universidad del País Vasco UPV/EHU, Bilbao, Spain (2015).
4. *Course on Quantum Technologies* in the Master of Quantum Science and Technology, at Universidad del País Vasco UPV/EHU, Bilbao, Spain (2014).
5. *Course on Quantum Optics and Quantum Information* in the Master of Quantum Science and Technology, at Universidad del País Vasco UPV/EHU, Bilbao, Spain (2014).

6. *Course on Trapped Ion Technologies and Quantum Simulations* at Shanghai University, Shanghai, China (October 1st-2nd 2014)
7. *Course on Quantum Field Theories for Future Quantum Technologies* at Instituto de Física Fundamental, CSIC, Madrid (October 22nd-24th 2013)
8. *Course on Quantum Simulations with Trapped Ions* at Universidad de Santiago de Chile, Santiago, Chile (May 9th-10th 2013)
9. *Course on Quantum Technologies* in the Master of Quantum Science and Technology, at Universidad del País Vasco UPV/EHU, Bilbao, Spain (2013).
10. During my postdoctoral stay at the Max-Planck Institut für Quantenoptik, I gave several review lectures and seminars on theoretical Quantum Optics (2007-2011).
11. Private lessons on Physics for 1st year undergraduate students in science and engineering, in Madrid, Spain (2004-2005).

PHYSICS SCHOOLS AND COURSES

1. Course *How to Write a Competitive Proposal for Horizon 2020*. Universidad del País Vasco, Bilbao, Spain. November 20th 2015. Sean McCarthy, Hyperion Ltd, through Proyectos Europeos, UPV/EHU.
2. *Research and Innovation Funding in HORIZON 2020 Program*. Library Building, University of the Basque Country UPV/EHU, Leioa, Spain. November 7th 2014.
3. *Seminar on ERC Grants 2014*. University of Deusto, Bilbao, Spain. December 16th 2013. University of Deusto and International Project Office, MINECO.
4. *Presentation skills: an introductory presentation course for scientists*. Faculty of Science and Technology, University of the Basque Country UPV/EHU, Leioa, Spain. December 4th and 12th 2013. Carl Sheaver, Concord Idiomas, Getxo.
5. *Seminar on Horizon 2020 Project Development*. Salón de Grados, Sarriko, Bilbao, Spain. November 21st 2013. Gabriella Lovasz, Europa Media, through Proyectos Europeos, UPV/EHU.
6. *Writing a successful ERC Grant application, 2013 call*. Universidad del País Vasco, San Sebastián, Spain. September 20th 2012. Mette Skraastad, Yellow Research, through Proyectos Europeos, UPV/EHU.
7. *IDEAS Programme: ERC Grants*. Universidad del País Vasco, Bilbao, Spain. November 11th 2011. Lotte Jaspers, Yellow Research, through Proyectos Europeos, UPV/EHU.

8. *How to write a competitive proposal for Framework 7*. Universidad del País Vasco, San Sebastián, Spain. June 21st 2011. Sean McCarthy, Hyperion Ltd, through Proyectos Europeos, UPV/EHU.
9. *Seminario de Introducción a la Algorítmica y Criptografía Cuánticas*. Universidad Politécnica de Madrid. June 2nd-10th 2005. Professors Jesús García López de Lacalle, Alfonsa García López and Francisco García Mazarío.
10. Physics course *Información Cuántica y Computación Cuántica*. Universidad Complutense de Madrid. February-May 2005. Professors Alberto Galindo and Miguel Angel Martín-Delgado.
11. Physics course *Información y Computación Cuánticas*. Universidad Autónoma de Madrid. February 2nd-6th 2004. Professors José Luis Sánchez-Gómez and Juan Ignacio Cirac.
12. Taller de Altas Energías (TAE) 2004. Santiago (Spain). September 13th-24th 2004. Universidad de Santiago (Spain). (two week school)
13. Summer school in Physics *Strings and Fields*. Heraklion, Crete. July 5th-9th 2004. Onassis Foundation. The gauge/gravity duality (one of its main examples is Maldacena's Conjecture). The lectures were given by some among the main researchers in String Theory. One name worth mentioning is Edward Witten, Fields Medal 1990, who selected the lectures and gave himself some of them. (one week school)
14. School *Cien años de Física Cuántica, desarrollo histórico-conceptual*. Lanzarote, the Canary Islands (Spain). summer of 2000 (centennial of quantum physics discovery by Max Planck). (one week school) Professors José Luis Sánchez-Gómez and Emilio Santos Corchero.

CONGRESSES AND MEETINGS

I have 27 invited talks in Congresses and Meetings, 49 invited seminars in prestigious institutions (see section below), 15 contributed talks, and 21 posters.

1. **L. Lamata**. Quantum Machine Learning with Quantum Technologies. Invited talk. Workshop on Quantum Information in Spain, ICE-4, Madrid, Spain, July 12-14 2017.
2. **L. Lamata**. Quantum Biomimetics and Quantum Machine Learning. Poster. Quantum Effects in Biological Systems Conference (QuEBS 2017), Jerusalem, Israel, March 26-30, 2017.
3. **L. Lamata**. Digital-analog quantum simulation of generalized Dicke models with superconducting circuits. Talk. APS March Meeting, New Orleans, Louisiana, US, March 13-17, 2017.

4. Quantum Machine Learning Summer School 2017, Drakensberg Mountains, South Africa, January 23-February 1, 2017. Talk in the Delegates Session, on Saturday 28 January, entitled “Quantum bits with trapped ions and superconducting circuits”.
5. **L. Lamata.** Digital-analog quantum simulation of generalized Dicke models with superconducting circuits. Coorganizer (local Co-Chair) and Poster. Workshop Ultra-strong light-matter interactions, University of the Basque Country, Bilbao, Spain, September 19-21, 2016.
6. Digital Quantum Simulations with Ions and Superconducting Circuits. Coorganizer and Poster. Basque Quantum Science and Technologies Workshop, nanoGUNE, Donostia, June 14, 2016.
7. 2nd Technological Forum on Quantum Technologies in Europe. Meeting by invitation only. Ministry of Economy and Competitiveness, Madrid, Spain, May 4th 2016.
8. **L. Lamata.** Final review of quantum simulations with superconducting circuits in SCALEQIT. Invited talk. EU Integrating Project SCALEQIT Review Meeting, European Commission, Brussels, Belgium, April 12th 2016.
9. **L. Lamata.** An overview of research lines in QUTIS. Invited talk. 1st Mini-Workshop Bilbao - Donostia focus on “Topology, spin-orbit, and quantum simulation”, February 17th 2016 (organized by Ikerbasque Fellow Enrique Rico and Ikerbasque Prof. Géza Giedke).
10. SCALEQIT Project Final Meeting, Delft, Netherlands. January 27th-29th 2016.
11. **L. Lamata.** New Avenues in Quantum Simulations. Invited talk. PQE, The Winter Colloquium on the Physics of Quantum Electronics, Snowbird, Utah, US, January 3rd-8th 2016.
12. ThinkQ 2015 - Challenges and applications for medium size quantum computers. Meeting by invitation only. Poster presented: Digital-analog quantum simulation with superconducting qubits. IBM T. J. Watson Research Center, Yorktown Heights, New York, US, December 2nd-4th 2015.
13. **L. Lamata.** Digital-Analog Quantum Simulations. Invited talk. Workshop Quantum Simulations: theory meets experiment, University of Oxford, UK, October 30th-31st 2015.
14. Workshop on Quantum Information in Spain, ICE-2, Bilbao, Spain. Co-Chair (organized together with Prof. Egusquiza), 1-3.6.2015.

15. **L. Lamata.** Quantum Simulations with Trapped Ions and Superconducting Circuits. Invited talk. Quantum Information for Quantum Chemistry Workshop, Senate House, University College London, 11-12.03.2015.
16. International Workshop *Quantum Simulations*. Benasque, Spanish Pyrenees. February 22nd-27th 2015.
17. **L. Lamata.** Quantum Simulations with Trapped Ions and Superconducting Circuits. Invited talk. Forum Math-for-Industry 2014. Fukuoka, Japan, October 27th-31st 2014.
18. **L. Lamata.** Digital Quantum Rabi and Dicke Models in Superconducting Circuits. Invited talk. Workshop on Mathematics and Physics of Interacting Quantum Systems (MPIQS), Fukuoka, Japan, October 23rd-24th 2014.
19. **L. Lamata.** Quantum Simulations with Trapped Ions and Superconducting Circuits. Invited talk. 23rd General Meeting of the International Commission for Optics (ICO). Santiago de Compostela, Spain, August 26th-29th 2014.
20. **L. Lamata.** Digital Quantum Simulations of Spin Systems in Superconducting Circuits. Invited talk. International Conference on Quantum Simulation 2014. SETI Institute, Mountain View, Silicon Valley, California, US. July 9th-10th 2014.
21. XXIII Annual Meeting of the Spanish Alexander von Humboldt Association “The role of science in the development of the European identity”. German Embassy in Spain, and Spanish Royal Academy of History, Madrid, Spain, 12th-14th June 2014.
22. **L. Lamata.** Quantum simulations with superconducting circuits in SCALEQIT. Invited talk. EU Integrating Project SCALEQIT Review Meeting, European Commission, Brussels, Belgium, April 7th 2014.
23. **L. Lamata.** Scalable quantum simulations with superconducting circuits. Invited talk. EU Integrating Project SCALEQIT Meeting, Saarbrücken, Germany, February 10th-12th 2014.
24. **L. Lamata.** Digital quantum simulations with superconducting circuits. Invited talk. EU Integrating Project SCALEQIT Meeting, Saarbrücken, Germany, February 10th-12th 2014.
25. 3rd Bonn Humboldt Award Winners’ Forum *Frontiers in Quantum Optics: Taming the World of Atoms and Photons — 100 Years after Niels Bohr*. This was a Meeting by invitation only in which 15 Humboldt Award Winners in Quantum Optics (some of the top flight researchers in this field, including Nobel Laureates Serge Haroche and Wolfgang Ketterle) gathered together with selected ex-Humboldt Fellows which are active

- in the field of Quantum Optics. **Invited Speakers:** Serge Haroche, Dieter Meschede, Jean-Michel Raimond, Howard J. Carmichael, Vahid Sandoghdar, Nil Davidson, Atac Imamoglu, Wolfgang Ketterle, Georgii V. Shlyapnikov, Massimo Inguscio, Michael Köhl, Tilman Pfau, Michael Fleischhauer, Arno Rauschenbeutel, Jian-Wei Pan, Andrea Alberti, David DiVincenzo, Jun Ye, Edward Allen Hinds, Gerald Gabrielse, and Markus Aspelmeyer. Hotel Bristol, Bonn. October 9th-12th 2013.
26. **L. Lamata.** Quantum Simulations of Fermions and Bosons with Trapped Ions. Talk. Benasque Workshop on Quantum Simulations. Benasque, Spanish Pyrenees. September 29th-October 4th 2013.
 27. **L. Lamata.** Quantum Simulations of Fermions and Bosons with Trapped Ions. Invited talk. ITAMP Topical Group Discussion on Trapped Ions. Harvard-Smithsonian Center for Astrophysics, Cambridge, US. September 19th-25th 2013.
 28. ITAMP Workshop on Quantum Applications with Trapped Ions. Meeting by invitation only. Harvard-Smithsonian Center for Astrophysics, Cambridge, US. September 16th-18th 2013.
 29. A. Mezzacapo, J. Casanova, **L. Lamata**, and E. Solano. Digital Quantum Simulation of the Holstein Model in Trapped Ions. Talk.XXXIV Reunión Bienal de la Real Sociedad Española de Física. Valencia, Spain, July 15th-19th 2013.
 30. **L. Lamata.** ScaleQIT & Quantum Simulations at UPV/EHU Bilbao. Invited talk. ScaleQIT Kick-Off Meeting. Aachen, Germany, April 15th-16th 2013.
 31. **L. Lamata.** Quantum Simulations with Trapped Ions. Invited talk. Workshop on Cold Atoms and Quantum Simulations. Department of Theoretical Physics and History of Science, UPV/EHU Bilbao, Spain, December 3rd-4th 2012 (organized by Ikerbasque Prof. Michele Modugno).
 32. Workshop on Quantum Simulations.Coorganizer and invited talk. Bilbao, Spain, October 22nd-25th 2012.
 33. J. Casanova, A. Mezzacapo, **L. Lamata**, and E. Solano. Quantum Simulation of Interacting Fermion Lattice Models in Trapped Ions. Talk. Spanish Workshop on Quantum Information, ICE-0. Madrid, Spain, September 17th-19th 2012.
 34. **L. Lamata.** Quantum Simulations with Trapped Ions. Invited talk. European Conference on Trapped Ions. Obergurgl, Tirol, Austria, September 10th-14th 2012.
 35. **L. Lamata**, C. López, B. Lanyon, T. Bastin, J. C. Retamal, and E. Solano. Efficient Generation of Symmetric Entanglement Classes in Trapped

- Ions. Invited talk. International Workshop on Quantum Entanglement and its Detection (QED³). Bilbao, Spain, September 3rd-5th 2012 (organized by Ikerbasque Prof. Géza Tóth).
36. **Authors: L. Lamata.** Quantum Simulations with Trapped Ions. Invited talk. Central European Workshop on Quantum Optics. Sinaia, Romania, July 2nd-6th 2012.
 37. **Authors: L. Lamata.** Quantum Technologies for Information Science (QUTIS) and PROMISCE Goals. Invited talk. Kick-off Meeting of the PROMISCE European Project. CSIC, Madrid, Spain, May 21st-22nd 2012.
 38. Talk by the President of the Basque Country on Future Scientific Strategies. I was invited, together with a selected and reduced group of scientists, businessmen, and politicians from the Basque region, to the presentation of the future policies in the region, by Basque Country Lehendakari, Patxi López. Museo Marítimo, Bilbao, Spain, April 21st 2012.
 39. A. Mezzacapo, J. Casanova, **L. Lamata**, and E. Solano. Topological Qubits with Majorana Fermions in Trapped Ions. Talk. Workshop on Topological States of Matter 2012. Freiburg, Germany, March 18th-22nd 2012.
 40. **J. Casanova**, A. Mezzacapo, **L. Lamata**, and E. Solano. Quantum simulations of interacting fermion lattice models in trapped ions. Poster. AQUTE Winterschool on Quantum Information Processing. Obergurgl, Tirol, Austria, February 6th-10th 2012.
 41. **J. Casanova**, **L. Lamata**, I. L. Egusquiza, R. Gerritsma, C. F. Roos, J. J. Garcia-Ripoll, and E. Solano. Quantum simulations of quantum field theories in trapped ions. Poster. AQUTE Winterschool on Quantum Information Processing. Obergurgl, Tirol, Austria, February 6th-10th 2012.
 42. **L. Lamata**, D. R. Leibbrandt, I. L. Chuang, J. I. Cirac, M. D. Lukin, V. Vuletic, and S. F. Yelin. Ion crystal transducer for strong coupling between single ions and single photons. Talk. XXXIII Reunión Bienal de la Real Sociedad Española de Física. Santander, Spain, September 19th-23rd 2011.
 43. J. Casanova, **L. Lamata**, I. L. Egusquiza, R. Gerritsma, C. F. Roos, J. J. Garcia-Ripoll, and E. Solano. Quantum simulations of quantum field theories in trapped ions. Talk. 18th Central European Workshop on Quantum Optics. Madrid, Spain, May 30th-June 3rd 2011.
 44. **L. Lamata**, D. R. Leibbrandt, I. L. Chuang, J. I. Cirac, M. D. Lukin, V. Vuletic, and S. F. Yelin. Ion crystal transducer for strong coupling between single ions and single photons. Invited talk. Workshop on Quantum Information and Quantum Dynamics in Ion Traps, QIon11. Madrid, Spain, April 26th-29th 2011.

45. **L. Lamata**, D. R. Leibbrandt, I. L. Chuang, J. I. Cirac, M. D. Lukin, V. Vuletic, and S. F. Yelin. Ion crystal transducer for strong coupling between single ions and single photons. Talk. American Physical Society March Meeting 2011. Dallas, Texas, US, March 21st-25th 2011.
46. J. Casanova, **L. Lamata**, I. L. Egusquiza, R. Gerritsma, C. F. Roos, J. J. Garcia-Ripoll, and E. Solano. Quantum simulations of quantum field theories in trapped ions. Invited talk. Quantum simulations. Benasque, Spanish Pyrenees, February 28th-March 5th 2011.
47. 2nd MPQ-ICFO Workshop *New Trends in Quantum Information and Quantum Optics*. Coorganizer. Monastery of Sant Benet, Barcelona, Spain, December 14th-17th 2010.
48. **L. Lamata**, D. Porras, J. I. Cirac, J. Goldman and G. Gabrielse. *Towards electron-electron entanglement in Penning traps*. Poster. 1st Joint Theory-Experiment MPQ Poster Session on Quantum Optics and Information with Atoms, Photons, Lattices, and Cavities. Max-Planck-Institut für Quantenoptik, Garching, Germany, November 26th 2010.
49. Workshop *Circuit QED for Quantum Information*. UPV/EHU, Bilbao, Spain. November 16th-17th 2010.
50. **L. Lamata**, D. Porras, J. I. Cirac, J. Goldman and G. Gabrielse. *Towards electron-electron entanglement in Penning traps*. Talk. International Conference on Quantum Information and Computation. Stockholm, Sweden, October 4th-8th 2010.
51. **L. Lamata**, D. Porras, J. I. Cirac, J. Goldman and G. Gabrielse. *Towards electron-electron entanglement in Penning traps*. Invited talk. Quantum Technologies Conference. Toruń, Poland, August 29th-September 3rd 2010.
52. **L. Lamata**, D. Porras, J. I. Cirac, J. Goldman and G. Gabrielse. *Towards electron-electron entanglement in Penning traps*. Talk. ESF Conference on Quantum Engineering of States and Devices: Theory and Experiments. Obergurgl, Tirol, Austria, June 5th-10th 2010.
53. **L. Lamata**, D. Porras, J. I. Cirac, J. Goldman and G. Gabrielse. *Towards electron-electron entanglement in Penning traps*. Invited talk. Quantum Information Theory Workshop. Reissensburg Castle, Ulm, Germany, May 11th-14th 2010.
54. **L. Lamata**, D. Porras, J. I. Cirac, J. Goldman and G. Gabrielse. *Towards electron-electron entanglement in Penning traps*. Talk. German Physical Society Spring Meeting '10. Leibniz Universität Hannover, Germany, March 8th-12th 2010.

55. **L. Lamata**, D. Porras, J. I. Cirac, J. Goldman and G. Gabrielse. *Towards electron-electron entanglement in Penning traps*. Talk. Theory Group Meeting '10, Max-Planck-Institut für Quantenoptik. Galtür, Tirol, Austria, January 31st-February 3rd 2010.
56. **L. Lamata**, J. León, D. Pérez-García, D. Salgado, and E. Solano. *On the impossibility to perform a global unitary operation sequentially*. Poster. *QIPC 2009*. Rome, Italy, September 21st-25th 2009.
57. **L. Lamata**, J. León, D. Pérez-García, D. Salgado, and E. Solano. *On the impossibility to perform a global unitary operation sequentially*. Poster. *CLEO/Europe-European Quantum Electronics Conference*. Munich, Germany, June 14th-19th 2009.
58. **L. Lamata**, J. León, D. Salgado, and E. Solano. *Inductive classification of multipartite entanglement under SLOCC*. Invited talk. Workshop *New trends in classification of multipartite entanglement*. University of Regensburg, Germany, February 11th-12th 2009.
59. Joint Workshop MPQ-Barcelona Research Centers on Quantum Information. Monastery of Sant Benet, Barcelona, Spain. December 3rd-6th 2008.
60. **Name:** Lindau Nobel Meeting-58th Meeting of Nobel Prize Winners in Physics. I had the pleasure and honour of meeting personally 24 Nobel Laureates in Physics. Lindau, Lake Constance, Germany. June 29th-July 4th 2008.
61. Humboldt Annual Meeting, organized by the Alexander von Humboldt Foundation. The highlight of the Meeting was the Reception for Humboldtians with the President of the Federal Republic of Germany, Prof. Köhler, in Bellevue Palace, Berlin. Berlin. June 23rd-24th 2008.
62. **L. Lamata**, D. Porras, and J. I. Cirac. Talk. Theory Group Meeting '08, Max-Planck-Institut für Quantenoptik. Kirchberg in Tirol, Austria, June 5th-8th 2008.
63. Y. Delgado, **L. Lamata**, J. León, D. Salgado, and E. Solano. *Sequential Quantum Cloning*. Poster. Solvay Workshop *Bits, Quanta and Complex Systems*. Brussels, Belgium, April 30h-May 4th 2008.
64. **T. Bastin**, C. Thiel, J. von Zanthier, L. Lamata, E. Solano, and G. S. Agarwal. *Operational monitoring of multi-qubit entanglement classes via tuning of local operations*. Poster. Solvay Workshop *Bits, Quanta and Complex Systems*. Brussels, Belgium, April 30h-May 4th 2008.
65. **Lucas Lamata**. *Quantum Information Implementations: Quantum Simulations with Atoms and Ions, Hybrid Quantum Computation, and Topological Quantum Computation*. Poster. Network Meeting of Humboldtians, organized by the Alexander von Humboldt Foundation (It is in-

- tended for the newly Humboldt Fellows in Germany to present their research projects, establish contacts and exchange ideas with each other). Marburg, Germany, February 13h-15th 2008.
66. **Lucas Lamata.** *Quantum Clock Synchronization.* Review Talk-Tutorial. Ringberg Castle 2007, Theory Group Meeting, Max-Planck-Institut für Quantenoptik. Ringberg Castle, Bavarian Alps, Germany, December 9th-12th 2007.
 67. **Lucas Lamata,** Juan José García-Ripoll, and Juan Ignacio Cirac. *How Much Entanglement Can Be Generated between Two Atoms by Detecting Photons?.* Poster. Photons, Atoms and Qubits 2007. Royal Society, London, September 2nd-5th 2007.
 68. International workshop *Quantum Computation and Topological Orders.* San Lorenzo de El Escorial. July 16th-20th 2007.
 69. International workshop *Quantum Information.* Benasque, Spanish Pyrenees. June 10th-29th 2007. Professors Juan Ignacio Cirac and Artur Ekert. Blackboard seminar (invited) in the relativistic quantum information session, entitled *Relativity and Lorentz Invariance of Entanglement Distillability.*
 70. **Lucas Lamata,** Juan José García-Ripoll, and Juan Ignacio Cirac. *How Much Entanglement Can Be Generated between Two Atoms by Detecting Photons?.* Poster. Gordon Research Conference on Quantum Information Science. Il Ciocco, Barga, Italy, April 15th-20th 2007.
 71. Lucas Lamata, **Juan León,** Tobias Schätz, and Enrique Solano. *Dirac Equation Simulation in a Single Trapped Ion.* Poster. Gordon Research Conference on Quantum Information Science. Il Ciocco, Barga, Italy, April 15th-20th 2007.
 72. **Lucas Lamata,** Juan León, and Enrique Solano. *Dynamics of momentum entanglement in lowest-order QED.* Poster. Gordon Research Conference on Quantum Information Science. Il Ciocco, Barga, Italy, May 7th-12th 2006.
 73. Lucas Lamata, Juan León, **David Salgado,** and Enrique Solano. *Inductive classification of multipartite entanglement.* Poster. Gordon Research Conference on Quantum Information Science. Il Ciocco, Barga, Italy, May 7th-12th 2006.
 74. **Lucas Lamata** and Juan León. *Dealing with entanglement of continuous variables: Schmidt decomposition with complete sets of orthogonal functions.* Poster. Quantum Information Processing 2006. Paris, January 16th-20th 2006.

75. **Lucas Lamata** and Juan León. *Evolución temporal de entrelazamiento bipartito en sistemas inestables*. Poster. XXX Reunión Bienal de la Real Sociedad Española de Física. Ourense (Spain), September 12th-16th 2005.
76. **Lucas Lamata** and Juan León. *Entrelazamiento en sistemas con variables continuas: Descomposición de Schmidt con conjuntos numerables de funciones ortonormales*. Poster. XXX Reunión Bienal de la Real Sociedad Española de Física. Ourense (Spain), September 12th-16th 2005.
77. International workshop *Quantum Information*. Benasque, Spanish Pyrenees. June 12th-July 1st 2005. Professors Juan Ignacio Cirac and Artur Ekert.
78. **Lucas Lamata** (Tutor: Juan León). *Condiciones Alternativas al Problema de Cauchy y Localización para el Fotón*. Poster. I Certamen Arquímedes of Introduction to Scientific Research (Final Stage). Palau de Pineda, Valencia, Spain. December 10th-13th 2002. Ministry of Education and Culture of Spain.

RESEARCH VISITS

I have visited several research groups from all continents (Europe, America, Asia, Africa, Oceania), for scientific collaborations.

1. California area, including the group of Google/University of California Santa Barbara. 10-26.08.2017.
2. Tel Aviv University, Tel Aviv, Israel, 23.3.2017.
3. Quantum Research Group, University of KwaZulu-Natal, Durban, South Africa, 19-23.1.2017.
4. Universidad de Granada, Granada, Spain, 20-22.7.2016.
5. Boston area, including the University of Massachusetts Boston, Harvard University, and the Massachusetts Institute of Technology (MIT), Boston and Cambridge, US, 22.6-9.7.2016.
6. National Institute of Standards and Technology (NIST), Boulder, Colorado, US. 20-21.6.2016.
7. D-Wave Systems Inc., Vancouver, British Columbia, Canada. 7.12.2015.
8. Walther-Meißner Institute, Garching, Germany. 23-30.9.2015.
9. California area, including the groups in Google LA, University of California San Diego, and Google/University of California Santa Barbara. 11-21.08.2015.

10. Institute for Quantum Optics and Quantum Information (IQOQI). Innsbruck, Austria. 15-16.7.2015.
11. Walther-Meißner Institute, Garching, Germany. 1-30.7.2015
12. The University of Tokyo, Tokyo, Japan. 1-5.11.2014.
13. Shanghai University, Shanghai, China. 28.9-12.10.2014.
14. NASA Ames Research Center, Mountain View, Silicon Valley, US. 17.7.2014
15. University of California Berkeley, Berkeley, US. 10-23.7.2014.
16. Google/University of California Santa Barbara, Santa Barbara, US. 29.06-7.7.2014.
17. Institute for Quantum Optics and Quantum Information (IQOQI). Innsbruck, Austria. 3-4.4.2014.
18. Instituto de Física Fundamental, CSIC. Madrid, Spain. 22-24.10.2013.
19. BCAM, Basque Center for Applied Mathematics. Bilbao, Spain. 8.10.2013.
20. Griffith University, Brisbane, Australia. 7.8.2013 and 9.8.2013.
21. University of Queensland. Brisbane, Australia. 3.8.2013-10.8.2013.
22. Macquarie University. Sydney, Australia. 26.7-3.8.2013 and 10.8-14.8.2013.
23. Nano-Bio Spectroscopy Group, Universidad del País Vasco UPV/EHU. San Sebastián, Spain. 10.7.2013.
24. Universidad de Granada, Granada, Spain. 5.6.2013.
25. Universidad de Murcia, Murcia, Spain. 4.6.2013.
26. Universidad Politécnica de Cartagena, Cartagena, Spain. 3.6.2013.
27. IFISC, Universidad de las Islas Baleares-CSIC. Palma de Mallorca, Islas Baleares, Spain. 24.5.2013.
28. Universidad de Santiago de Chile. Santiago de Chile, Chile. 5-15.05.2013.
29. Shanghai University, Shanghai, China. 31.3-2.4.2013.
30. Institute for Interdisciplinary Information Sciences (IIIS), Tsinghua University. Beijing, China. 27-30.3 and 2-6.4.2013.
31. Institute of Telecommunications, IST, Universidade Técnica de Lisboa. Lisbon, Portugal. 13-14.12.2012.
32. Walther Meißner Institut. Garching, Germany. 6-10.8.2012.
33. ETH Zürich. Quantum Device Lab. Zürich, Switzerland. 17-27.7.2012.

34. Instituto de Física Fundamental, CSIC. Quantum Information and Foundations Group, QUINFOG. Madrid, Spain. 17-22.5.2012.
35. Institute for Quantum Optics and Quantum Information (IQOQI). Innsbruck, Austria. 2-3.2.2012.
36. Centre for Quantum Photonics, University of Bristol. Bristol, UK. 31.7-16.8.2011.
37. Institute for Quantum Optics and Quantum Information (IQOQI). Innsbruck, Austria. 11-13.4.2011.
38. Universidad del País Vasco-Euskal Herriko Unibertsitatea. Bilbao, Spain. 29.3-2.4.2011.
39. Technische Universität München. Physik Department, T34. Garching, Germany. February 3rd 2011.
40. Instituto de Física Fundamental, CSIC. Quantum Information and Foundations Group, QUINFOG. Madrid, Spain. 3-4.1.2011.
41. Universidad del País Vasco-Euskal Herriko Unibertsitatea. Bilbao, Spain. 15-19.11.2010.
42. Harvard University, Physics Department, Cambridge, Massachusetts, US. 1-11.12.2009.
43. Universidad del País Vasco-Euskal Herriko Unibertsitatea. Foundations of Quantum Mechanics Group. Bilbao, Spain. 10-21.8.2009.
44. Instituto de Física Fundamental, CSIC. Quantum Information and Foundations Group, QUINFOG Madrid, Spain. 23.7, 28.7.2009.
45. Universität Erlangen-Nürnberg, Institute for Optics, Information and Photonics, Erlangen, Germany. 28-29.5.2009.
46. Universidad del País Vasco-Euskal Herriko Unibertsitatea. Foundations of Quantum Mechanics Group. Bilbao, Spain. 22-26.9.2008.
47. ICFO-Institut de Ciències Fotòniques. Quantum Information Group. Castelldefels, Spain. 5-9.3.2007.
48. University of Leeds. Quantum Information Group, School of Physics and Astronomy. Leeds, UK. 22-24.2.2007.
49. Ludwig-Maximilian University Munich (Theoretical Condensed Matter Group). Munich, Germany. 23.11-5.12.2006.
50. Max-Planck Institute for Quantum Optics. Theory Division. Garching, Germany. 25.6-26.8 2006.

51. Centre for Quantum Computation, DAMTP, University of Cambridge. Cambridge, UK. 13-16.3.2006.
52. Max-Planck Institute for Quantum Optics. Theory Division. Garching, Germany. 1.7-31.8.2005.

INVITED SEMINARS

1. *Useful Quantum Supremacy?*, Google, Santa Barbara, California, US, 14.08.2017.
2. *Quantum Machine Learning without Measurements*. University of KwaZulu-Natal, Durban, South Africa, 20.1.2017.
3. *Digital-Analog Quantum Simulations*. Harvard University, Cambridge, Massachusetts, US. Department of Chemistry and Chemical Biology. 7.7.2016.
4. *Digital Quantum Simulations with Trapped Ions*. University of Massachusetts Boston, Boston, Massachusetts, US. 28.6.2016.
5. *Digital Quantum Simulations with Trapped Ions*. National Institute of Standards and Technology (NIST), Boulder, Colorado, US. 20.6.2016.
6. *Digital-analog quantum computing with superconducting circuits*. D-Wave Systems Inc., Vancouver, British Columbia, Canada. 7.12.2015.
7. *Implementing unphysical operations and embedding quantum simulators*. Google, Santa Barbara, California, US. 18.08.2015.
8. *Digital-analog quantum simulations*. University of California San Diego, San Diego, California, US. 13.08.2015.
9. *Unphysical operations and embedding quantum simulators*. Google, Venice (Los Angeles), California, US. 12.08.2015.
10. *Digital-analog quantum simulations*. Google, Venice (Los Angeles), California, US. 12.08.2015.
11. *Quantum Simulations with Superconducting Circuits*. Walther-Meißner Institute, Garching, Germany. 17.07.2015.
12. *Digital Quantum Rabi and Dicke Models with Superconducting Circuits*. The University of Tokyo, Tokyo, Japan. 4.11.2014.
13. *Quantum Simulations with Trapped Ions and Superconducting Circuits*. Shanghai University, Shanghai, China. 30.09.2014.
14. *Digital Quantum Simulations with Superconducting Circuits*. NASA Ames Research Center. Mountain View, Silicon Valley, US. 17.07.2014.

15. *Quantum Simulations of Fermions and Bosons with Trapped Ions*. University of California Berkeley, Berkeley, US. 16.07.2014.
16. *Digital Quantum Simulation of Spin Systems in Superconducting Circuits*. University of California Berkeley, Berkeley, US. 14.07.2014.
17. *Digital Quantum Simulation of Spin Systems in Superconducting Circuits*. Google/University of California Santa Barbara, Santa Barbara, US. 30.06.2014.
18. *Simulation of Interacting Fermions and Bosons with Trapped Ions*. Institute for Quantum Optics and Quantum Information (IQOQI), Innsbruck, Austria. April 3rd 2014.
19. *Dirac Equation of a Free Relativistic Particle*. BCAM, Basque Center for Applied Mathematics, Bilbao, Spain. October 8th 2013.
20. *Quantum Simulations of Fermions and Bosons with Trapped Ions*. Griffith University, Brisbane, Australia. August 9th 2013.
21. *Quantum Simulations of Fermions and Bosons with Trapped Ions*. Macquarie University, Sydney, Australia. August 1st 2013.
22. *Quantum Simulations with Trapped Ions*. Nano-Bio Spectroscopy Group, Universidad del País Vasco UPV/EHU, San Sebastián, Spain. June 10th 2013.
23. *Quantum Simulations with Trapped Ions*. Universidad de Granada, Granada, Spain. June 5th 2013.
24. *Quantum Simulations with Trapped Ions*. Universidad de Murcia, Murcia, Spain. June 4th 2013.
25. *Quantum Simulations with Trapped Ions*. Universidad Politécnica de Cartagena, Cartagena, Spain. June 3rd 2013.
26. *Quantum Simulations with Trapped Ions*. IFISC, Universidad de las Islas Baleares-CSIC, Palma de Mallorca, Spain. 24.5.2013.
27. *Topological qubits with Majorana fermions in trapped ions*. Universidad de Santiago de Chile, Chile. 8.5.2013.
28. *Interacting fermions and bosons with trapped ions*. Shanghai University, Shanghai, China. 1.4.2013.
29. *Interacting fermions and bosons with trapped ions*. IIIS, Tsinghua University, Beijing, China. 29.3.2013.
30. *Quantum Biomimetics*. Institute of Telecommunications, IST, Universidade Técnica de Lisboa, Lisbon, Portugal. 13.12.2012.

31. *Quantum Simulations with Trapped Ions*. Walther Meißner Institut, Garching, Germany. 7.8.2012.
32. *Quantum Simulations with Trapped Ions*. ETH Zürich, Switzerland. Physics Department. 19.7.2012.
33. *Topological Qubits with Majorana Fermions in Trapped Ions*. Institute for Quantum Optics and Quantum Information (IQOQI), Innsbruck, Austria. 2.2.2012.
34. *Quantum simulation of quantum field theories in trapped ions*. University of Bristol, UK. Centre for Quantum Photonics. 10.8.2011.
35. Seminar on trapped ion technologies and quantum simulations with trapped ions, Centre for Quantum Photonics, University of Bristol, UK. 2.8.2011.
36. *Towards electron-electron entanglement in Penning traps*. Technische Universität München, Germany. Physik Department, T34. 3.2.2011.
37. *Towards electron-electron entanglement in Penning traps*. Universidad del País Vasco-Euskal Herriko Unibertsitatea, Bilbao, Spain. Dpto. de Química Física. 17.11.2010.
38. *Quantum Mechanics: the physics of the small world*. Max-Planck-Institut für Quantenoptik. Dissemination talk about quantum mechanics for a group of 60 high-school students from Spain visiting MPQ. 16.6.2010.
39. *The possible entanglement of trapped electrons with applications*. Harvard University, Cambridge, Massachusetts, US. Physics Department. 8.12.2009.
40. *Relativity and Lorentz Invariance of Entanglement Distillability*. Universidad del País Vasco-Euskal Herriko Unibertsitatea, Bilbao, Spain. Dpto. de Química Física. 23.9.2008.
41. *How Much Entanglement Can Be Generated between Two Atoms by Detecting Photons?* ICFO-Institut de Ciències Fotòniques, Castelldefels, Spain. Quantum Information Group. 6.3.2007.
42. *How Much Entanglement Can Be Generated between Two Atoms by Detecting Photons?* University of Leeds, UK. Quantum Information Group, School of Physics and Astronomy. 23.2.2007.
43. *Dirac equation and relativistic effects in a single trapped ion*. Ludwig-Maximilian University Munich, Germany. Theoretical Condensed Matter Group. 29.11.2006.
44. *Relativity and Lorentz Invariance of Entanglement Distillability*. Max-Planck Institute for Quantum Optics, Garching, Germany. Quantum Optics Group, Theory Division. 25.7.2006.

45. *Recent developments on entanglement, quantum field theory, and special relativity*. Centre for Quantum Computation, DAMTP, University of Cambridge. Cambridge, UK. 15.3.2006.
46. *Dynamics of momentum entanglement in lowest-order QED*. Max-Planck Institute for Quantum Optics, Garching, Germany. Quantum Optics Group, Theory Division. 1.8.2005.
47. *Entrelazamiento de variables continuas: Descomposición de Schmidt con conjuntos numerables de funciones ortonormales*. Instituto de Óptica Daza de Valdés, CSIC, Madrid. 25.5.2005.
48. *Óptica cuántica en dieléctricos*. Instituto de Óptica Daza de Valdés, CSIC, Madrid. April 2003.
49. *Difracción temporal de ondas de materia*. Instituto de Óptica Daza de Valdés, CSIC, Madrid. March 2002.

PROFESSIONAL SERVICE

1. **Associate Editor** for the journal [Quantum Measurements and Quantum Metrology \(De Gruyter\)](#). (2017-Today).
2. **Referee for 27 ISI-indexed scientific journals:** *Nature*, *npj Quantum Information*, *Physical Review X*, *Physical Review Letters* (≥ 55), *Scientific Reports*, *Physical Review A*, *Physical Review B*, *Physical Review D*, *Physical Review E*, *Quantum Information and Computation*, *New Journal of Physics*, *Optics Express*, *Applied Physics B*, *Optics Communications*, *Journal of the Optical Society of America B*, *Photonics*, *Journal of Statistical Mechanics*, *Europhysics Letters*, *European Physical Journal Quantum Technology*, *European Physical Journal D*, *Journal of Physics A*, *Journal of Physics B*, *Journal of Physics: Conference Series*, *Physics Letters A*, *Entropy*, *Physica Scripta*, *Foundations of Physics*. ≥ 180 referrals realized since 2007 (≥ 100 for American Physical Society journals).
3. Evaluator for the *Spanish National Agency for Project Evaluation (ANEP)*. Since 2014, I have evaluated projects from national calls for a total amount of more than 1.5 million Euros.
4. Member of the ANEP Commission that evaluated the Ramón y Cajal tenure-track grant applications in the call 2014.
5. Evaluator for Postdoctoral Fellowships funded by EU H2020 Marie Skłodowska-Curie actions.
6. Evaluator for the Postdoctoral Fellowship Programme of the German Academic Exchange Service (DAAD).

7. Evaluator of scientific grants for public universities in Colombia, via the Colombian Science and Technology Observatory.
8. Evaluator of scientific grants for the National Commission for Scientific and Technological Research of Chile (CONICYT).
9. Evaluation Committee member in the PhD Thesis defence of Mr. André Luiz Fonseca de Oliveira, at Polytechnic University of Madrid, which took place 26th April 2017. Advisor, Prof. Jesús García-López de Lacalle. Committee: president, Prof. Miguel Ángel Martín-Delgado; secretary, Prof. Vicente Martín; vocales, Prof. David Pérez-García, Prof. Pedro Jesús Salas, and Dr. Lucas Lamata.
10. Evaluation Committee member in the PhD Thesis defence of Mr. Antonio Mezzacapo, at University of the Basque Country, which took place 1st June 2015. Advisor, Prof. Enrique Solano. Committee: president, Prof. Andreas Wallraff; secretary, Dr. Lucas Lamata; vocales, Dr. Frank Deppe, Prof. Luiz Davidovich, and Prof. Iñigo Egusquiza.
11. Evaluation Committee member (reserve) in the PhD Thesis defence of Mr. Urtzi Las Heras, at University of the Basque Country, which took place 24th May 2017. Committee: president, Dr. Stefan Filipp; secretary, Prof. Iñigo Egusquiza; vocal, Prof. Géza Giedke; reserves, Dr. Lucas Lamata, Dr. David Zueco, and Dr. Jorge Casanova.
12. Evaluation Committee member (reserve) in the PhD Thesis defence of Mr. Roberto Di Candia, at University of the Basque Country, which took place 25th June 2015. Advisor, Prof. Enrique Solano. Committee: president, Prof. Jens Eisert; secretary, Prof. Iñigo Egusquiza; vocales, Prof. Cristiano Ciuti, Prof. John Calsamiglia and Dr. Mikel Sanz; reserves, Dr. Lucas Lamata, Dr. Frank Deppe, and Prof. Göran Johansson.
13. Evaluation Committee member (reserve) in the PhD Thesis defence of Mr. Jorge Casanova, at University of the Basque Country, which took place 11th January 2013. Advisor, Prof. Enrique Solano. Committee: president, Prof. Rainer Blatt; secretary, Prof. Iñigo Egusquiza; vocales, Prof. Martín Plenio, Prof. Ferdinand Schmidt-Kaler and Prof. Miguel Ángel Martín-Delgado; reserves, Dr. Lucas Lamata and Dr. Juan José García-Ripoll.
14. I was a member of the Evaluation Committee in the Master Thesis defence of Mr. Julen S. Pedernales, at University of the Basque Country, on 7th September 2012.
15. I was a member of the Evaluation Committee in the Master Thesis defence of Ms. Laura García-Álvarez, at University of the Basque Country, on 28th September 2013.

16. I was a member of the Evaluation Committee in the Master Thesis defence of Mr. Íñigo Arrazola, at University of the Basque Country, on 11th September 2015.
17. I have provided reference letters for PhD students and young postdocs from Germany and Italy, among others.
18. I chaired conference sessions at Central European Workshop on Quantum Optics, Sinaia, Romania, July 2nd-6th 2012, at the Biennial Conference of the Royal Spanish Physical Society, Valencia, Spain, July 15th-19th 2013, at the International Conference on Quantum Simulations, Bidasoa, Spain, February 22nd-26th 2015, and at the Spanish Quantum Information Conference, ICE-4, Madrid, Spain, July 12th-14th 2017.
19. **Creator and Webmaster** of the webpage of QUTIS (Quantum Technologies for Information Science) at Universidad del País Vasco, Bilbao, Spain, group led by Prof. Enrique Solano, during the period 2011-2013 (this webpage has now been substituted by a newer one).
20. **Creator and Webmaster** of the group webpage of QUINFOG (Quantum Information and Foundations Group) at IMAFF, CSIC, Madrid, group led by Prof. Juan León, during the period 2006-2007, and Webmaster, during the same period, of the departmental webpage of the Departamento de Partículas, Campos, y Cosmología, IMAFF, CSIC, Madrid (these webpages do not exist anymore).
21. **Creator and Webmaster** of the webpage of the Workshop on Quantum Simulations, celebrated 22nd-25th October 2012 at Universidad del País Vasco UPV/EHU Bilbao, Spain.
<https://sites.google.com/site/quantumsimulationsbilbao12/>
22. **Creator and Webmaster** of the webpage of the Workshop Información Cuántica, España (ICE-2), which was held 1-3 June 2015, University of the Basque Country, Bilbao, Spain.
<https://sites.google.com/site/ice2bilbao>
23. **Creator and Webmaster** of the webpage of the International Workshop **Ultra-strong light-matter interactions: theory and applications to quantum information**, which was held 19-21 September 2016, University of the Basque Country, Bilbao, Spain.
<http://www.qutisgroup.com/workshop-on-ultra-strong-light-matter-interactions/>

RESEARCH IMPACT IN THE MEDIA

- **Several press releases** from the University of the Basque Country related to my scientific articles.

- **About 10 of my articles have been highlighted** in the Media, with **more than 100 news articles**, including most important regional and national newspapers in the Basque Country and Spain and several international scientific portals as MIT Technology Review, Phys Org, Science News, Scientific American, among others. For an (almost) complete list of news articles, visit the link <https://sites.google.com/site/lucaslamata/research-highlights>, where each highlighted article includes the links to the news entries.

Selection of Media entries:

1. **Title:** *Científicos de récord: los españoles detrás del ordenador cuántico de Google.*
Source: El Confidencial.
URL: http://www.elconfidencial.com/tecnologia/2016-09-05/cientificos-de-record-los-espanoles-detras-del-ordenador-cuatico-de-google_1254610/
Highlighted article: Digitized adiabatic quantum computing with a superconducting circuit.
Date: September 5th 2016.
2. **Title:** *Google bate el récord de computación cuántica gracias a una idea española.*
Source: EL PAIS.
URL: http://elpais.com/elpais/2016/06/10/ciencia/1465574384_081059.html
Highlighted article: Digitized adiabatic quantum computing with a superconducting circuit.
Date: June 13th 2016.
3. **Title:** *La UPV/EHU y Google colaboran en un experimento de computación cuántica.*
Source: ABC.
URL: <http://agencias.abc.es/agencias/noticia.asp?noticia=2222423>
Highlighted article: Digitized adiabatic quantum computing with a superconducting circuit.
Date: June 8th 2016.
4. **Title:** *Quantum annealing with a digital twist.*
Source: Google Research Blog.
URL: <https://research.googleblog.com/2016/06/quantum-annealing-with-digital-twist.html>
Highlighted article: Digitized adiabatic quantum computing with a superconducting circuit.
Date: June 8th 2016.
5. **Title:** *Consiguen que los átomos hagan cosas “absurdas”.*
Source: La Razón.

URL: <http://www.larazon.es/sociedad/ciencia/consiguen-que-los-atomos-hagan-cosas-absurdas-KP10863911#.Ttt1oRN1iclPxLw>

Highlighted article: Time reversal and charge conjugation in an embedding quantum simulator.

Date: October 1st 2015.

6. **Title:** *La UPV desentraña un algoritmo que ‘puede revolucionar la tecnología’.*
Source: El Correo.
URL: <http://www.elcorreo.com/agencias/pais-vasco/201508/03/desentrania-algoritmo-puede-revolucionar-455459.html>
Highlighted article: Digital quantum simulation of fermionic models with a superconducting circuit.
Date: August 3rd 2015.
7. **Title:** *Investigadores de la UPV/EHU desentrañan el algoritmo cuántico “más avanzado que se conoce”.*
Source: Deia.
URL: <http://www.deia.com/2015/08/03/sociedad/euskadi/investigadores-de-la-upvehu-desentranan-el-algoritmo-cuantico-mas-avanzado-que-se-conoce>
Highlighted article: Digital quantum simulation of fermionic models with a superconducting circuit.
Date: August 3rd 2015.
8. **Title:** *La UPV desentraña un algoritmo que ‘puede revolucionar la tecnología’.*
Source: ABC.
URL: <http://agencias.abc.es/agencias/noticia.asp?noticia=1950764>
Highlighted article: Digital quantum simulation of fermionic models with a superconducting circuit.
Date: August 3rd 2015.
9. **Title:** *La UPV desentraña un algoritmo que ‘puede revolucionar la tecnología’.*
Source: El Mundo.
URL: <http://www.elmundo.es/pais-vasco/2015/08/03/55bf407f46163f2f788b457f.html>
Highlighted article: Digital quantum simulation of fermionic models with a superconducting circuit.
Date: August 3rd 2015.
10. **Title:** *Simulating fermionic particles with superconducting quantum hardware.*
Source: Google Research Blog.
URL: <http://googleresearch.blogspot.de/2015/07/simulating-fermionic-particles-with.html>
Highlighted article: Digital quantum simulation of fermionic models with a superconducting circuit.
Date: July 13th 2015.

11. **Title:** *Una investigación de la UPV sobre cuántica genera interés internacional.*
Source: El Correo.
URL: <http://www.elcorreo.com/agencias/pais-vasco/201506/09/investigacion-sobre-cuantica-genera-412173.html>
Highlighted article: Artificial Life in Quantum Technologies.
Date: June 9th 2015.
12. **Title:** *Una investigación de la UPV sobre física cuántica genera interés internacional.*
Source: El Mundo.
URL: <http://www.elmundo.es/pais-vasco/2015/06/09/5576c31bca4741857c8b4579.html>
Highlighted article: Artificial Life in Quantum Technologies.
Date: June 9th 2015.
13. **Title:** *Vida artificial en tecnologías cuánticas.*
Source: Catalunya Vanguardista.
URL: <http://www.catalunyavanguardista.com/catvan/vida-artificial-en-tecnologias-cuanticas/>
Highlighted article: Artificial Life in Quantum Technologies.
Date: June 9th 2015.
14. **Title:** *Quantum Life Spreads Entanglement Across Generations.*
Source: MIT Technology Review.
URL: <http://www.technologyreview.com/view/537676/quantum-life-spreads-entanglement-across-generations/>
Highlighted article: Artificial Life in Quantum Technologies.
Date: May 19th 2015.
15. **Title:** *Taking entanglement beyond one ebit.*
Source: PhysOrg.
URL: <http://www.physorg.com/news88766849.html>
Highlighted article: How Much Entanglement Can Be Generated between Two Atoms by Detecting Photons?
Date: January 23rd 2007.

OUTREACH ACTIVITIES

1. **Activity:** I have contributed to Wikipedia scientific pages on quantum technologies.
Date: Since 2017.
2. **Activity:** Presentation about the structure and management of QUTIS Group to entrepreneur students from Mondragón University, Spain, that visited our group.
Date: September 25th 2014.

3. **Activity:** I was the coordinator of five group visits of high school students from Bilbao German School to QUTIS Group.
Date: January 31st 2013, February 4th 2014, February 18th 2015, April 5th 2016, and February 23rd 2017.
4. **Activity:** Interview and videoconference with two groups of about 50 high-school students from Orihuela (Alicante, Spain), that asked me questions about the quantum computer and research in general, and about the Max-Planck Institute and Prof. Cirac's group in particular.
Date: April 7th 2011.
5. **Title:** *Quantum Mechanics: the physics of the small world.*
Center: Max-Planck-Institut für Quantenoptik.
Character: Dissemination talk about quantum mechanics for a group of 60 high-school students from Spain visiting MPQ.
Date: June 16th 2010.

SCIENTIFIC MANAGEMENT EXPERIENCE

1. Coorganizer of the International Workshop **Ultra-strong light-matter interactions: theory and applications to quantum information**, which was held September 19-21, 2016, University of the Basque Country, Bilbao, Spain. **International Organizing Committee:** M. Batchelor (Co-Chair), D. Braak, Q.-H. Chen, E. Solano (Chair), C. Wilson, **International Advisory Committee:** C. Ciuti, F. Deppe, M. Hirokawa, K. Semba, M. Wakayama, **Local Organizing Committee:** I. L. Egusquiza, L. Lamata (Co-Chair), E. Rico (Chair), and M. Sanz. There were 35 invited speakers from Asia, America, Europe and Australia, and 73 participants in total.
2. Coorganizer, together with Geza Giedke (Donostia International Physics Center) and Nacho Pascual (nanoGUNE), of the Basque Quantum Science and Technologies Workshop, June 14, 2016, nanoGUNE, Donostia.
3. Coorganizer of the Workshop **Quantum Information, Spain (ICE-2)**, which was held 1-3 June 2015, University of the Basque Country, Bilbao, Spain. **Local Organizing Committee:** Iñigo L. Egusquiza (Chair), Lucas Lamata (Co-Chair), Marisa Pons, Michele Modugno, Jens Siewert, Géza Tóth, Matthias Kleinmann, Géza Giedke, Enrique Solano. **Plenary Speakers:** Andreas Wallraff (ETH Zurich), Luiz Davidovich (Universidade Federal do Rio de Janeiro), Yasser Omar (University of Lisbon). **Invited Speakers:** Antonio Acín (ICFO), Adán Cabello (Universidad de Sevilla), Juan León (CSIC, Madrid), Gonzalo Muga (Universidad del País Vasco), Daniel Rodríguez (Universidad de Granada), Mikel Sanz (Universidad del País Vasco), Roberta Zambrini (CSIC, Palma de Mallorca), David Zueco (Universidad de Zaragoza). There were also 18 contributed speakers, 9 posters, and in total 53 participants.

4. Member of the Scientific Committee of the Quantum Information Symposium at the Biennial Conference of the Royal Spanish Physical Society, that took place in Valencia, Spain, 15th-19th July 2013.
5. Coorganizer of the **Workshop on Quantum Simulations**, that took place 22nd-25th October 2012 in Bilbao, Spain, together with Enrique Solano, Göran Wendin and Guillermo Romero. The total number of participants was 125, from many countries of all continents, including as invited speakers (in chronological order), Hans Mooij, Tilman Esslinger, Jens Eisert, Franco Nori, Frank Wilhelm, Fabio Sciarrino, Philip Walther, Pierre Barthelemy, Martin Plenio, Christian Roos, Rosario Fazio, José Ignacio Latorre, Joe Britton, Martin Weitz, Jake Taylor, Marcello Dalmonte, Barry Sanders, Ferdinand Schmidt-Kaler, Luca Tagliacozzo, Andreas Wallraff, Göran Wendin, Lucas Lamata, Matteo Rizzi, Matthew Broome, Crystal Senko, Dieter Jaksch, Marc Cheneau, Matteo Mariantoni, Alberto Peruzzo, and Juan José García-Ripoll.
6. Coorganizer of the 2nd MPQ-ICFO Workshop *New Trends in Quantum Information and Quantum Optics*, December 14th-17th 2010, Monastery of Sant Benet, Barcelona, Spain.
7. Organizer of the Poster Exhibition of the MPQ Theory Division for the MPQ Evaluation³ by the External Scientific Advisory Board in October 6th-7th 2010.

AWARDS AND HONORS

1. Up to 11 of my theoretical proposals for implementations have been carried out in experiments by top-flight groups:
 - (a) My proposal in the article L. Lamata *et al.*, *Dirac Equation and Quantum Relativistic Effects in a Single Trapped Ion*, PRL **98**, 253005 (2007), was carried out in an experiment in the leading European trapped-ion group of Prof. Rainer Blatt in Innsbruck, and published in R. Gerritsma, R. Blatt, C. F. Roos, *et al.*, Nature **463**, 68 (2010).
 - (b) My proposal in the article U. Las Heras, L. García-Álvarez, A. Mezzacapo, E. Solano, and L. Lamata, *Fermionic models with superconducting circuits*, EPJ Quantum Technology **2**, 8 (2015), was performed in an experiment in the group of Prof. John Martinis at Google and University of California Santa Barbara, published in R. Barends, *et al.*, *Digital quantum simulation of fermionic models with a superconducting circuit*, Nature Commun. **6**, 7654 (2015). ArXiv:1501.07703.

³Every two years, the Divisions of the Max-Planck-Institut für Quantenoptik are evaluated by an External Scientific Advisory Board, composed of 2-3 Nobel Prizes and about 10 leaders in their respective fields. Every Division at MPQ is responsible, among other activities, for presenting their research results in a Poster Exhibition to the Advisory Board.

- (c) My proposal in the article A. Mezzacapo, U. Las Heras, J. S. Pedernales, L. DiCarlo, E. Solano, and L. Lamata, *Digital Quantum Rabi and Dicke Models in Superconducting Circuits*, Sci. Rep. **4**, 7482 (2014), was realized in an experiment in Prof. Leonardo DiCarlo group at Delft University of Technology, Netherlands, published in N. K. Langford, *et al.*, *Experimentally simulating the dynamics of quantum light and matter at ultrastrong coupling*, ArXiv:1610.10065.
- (d) My proposal in the article U. Las Heras, A. Mezzacapo, L. Lamata, S. Filipp, A. Wallraff, and E. Solano, *Digital Quantum Simulation of Spin Systems in Superconducting Circuits*, PRL **112**, 200501 (2014), was carried out in an experiment at ETH Zurich in Prof. Andreas Wallraff group, published in Y. Salathé *et al.*, *Digital Quantum Simulation of Spin Models with Circuit Quantum Electrodynamics*, Phys. Rev. X **5**, 021027 (2015). ArXiv:1502.06778.
- (e) My proposal in the article L. Lamata *et al.*, *Ion Crystal Transducer for Strong Coupling between Single Ions and Single Photons*, PRL **107**, 030501 (2011), was partially realized in
 - i) an experiment performed at the Massachusetts Institute of Technology: M. Cetina, I. Chuang, V. Vuletić, *et al.*, *One-dimensional array of ion chains coupled to an optical cavity*, New J. Phys. **15**, 053001 (2013), and in
 - ii) two experiments performed in the Innsbruck trapped ion group:
 - B. Casabone, R. Blatt, T. E. Northup, *et al.*, *Heralded Entanglement of Two Ions in an Optical Cavity*, Phys. Rev. Lett. **111**, 100505 (2013). Selected as Editor's Suggestion, and
 - B. Casabone, R. Blatt, T. E. Northup, *et al.*, *Enhanced Quantum Interface with Collective Ion-Cavity Coupling*, Phys. Rev. Lett. **114**, 023602 (2015). Selected as Editor's Suggestion and featured in Physics (in this paper I am included in the acknowledgements).
 See also the [PhD Thesis of Bernardo Casabone](#), Universität Innsbruck, including a complete analysis of the proposal's experimental realization.
- (f) My proposal in the article J. Casanova, L. Lamata, *et al.*, *Quantum Simulation of Quantum Field Theories in Trapped Ions*, PRL **107**, 260501 (2011), was realized in an experiment in the Tsinghua University trapped-ion group of Prof. Kihwan Kim, published in Xiang Zhang *et al.*, *Fermion-antifermion scattering via boson exchange in a trapped ion*. ArXiv:1611.00099.
- (g) My proposal in the article L. Lamata *et al.*, *The nonrelativistic limit of the Majorana equation and its simulation in trapped ions*, Phys. Scr. **T147**, 014017 (2012), was carried out in an experiment in the Tsinghua University trapped-ion group of Prof. Kihwan Kim, published in Xiang Zhang *et al.*, *Time reversal and charge conjugation in an embedding quantum simulator*, Nature Commun. **6**, 7917 (2015).

- (h) My proposal in the article M.-H. Yung, J. Casanova, A. Mezzacapo, J. McClean, L. Lamata, A. Aspuru-Guzik, and E. Solano, *From transistor to trapped-ion computers for quantum chemistry*, Sci. Rep. **4**, 3589 (2014), was performed in an experiment in the Tsinghua University trapped-ion group of Prof. Kihwan Kim, published in Yangchao Shen, Man Hong Yung, Kihwan Kim, *et al.*, Quantum implementation of unitary coupled cluster for simulating molecular electronic structure, Phys. Rev. A **95**, 020501(R) (2017).
 - (i) My proposal in the article J. S. Pedernales, I. Lizuain, S. Felicetti, G. Romero, L. Lamata, and E. Solano, *Quantum Rabi Model with Trapped Ions*, Sci. Rep. **5**, 15472 (2015), was preliminary performed in an experiment in the Tsinghua University trapped-ion group of Prof. Kihwan Kim, published in Dingshun Lv *et al.*, *Quantum simulation of the quantum Rabi model in a single trapped ion*, Proceedings of the 17th Asian Quantum Information Science Conference: AQIS2017, pp 575-576.
 - (j) The concepts in the theory article U. Alvarez-Rodriguez, M. Sanz, L. Lamata, and E. Solano, *The Forbidden Quantum Adder*, Sci. Rep. **5**, 11983 (2015), were carried out in an experiment at the University of Science and Technology of China, Hefei, published in Xiao-Min Hu, Guang-Can Guo, Yong-Sheng Zhang, *et al.*, Phys. Rev. A **94**, 033844 (2016), as well as an experiment at the Institute for Quantum Computing in Canada, published in Keren Li, Raymond Laflamme, *et al.*, Phys. Rev. A **95**, 022334 (2017), and an experiment at TU Dortmund, published in Shruti Dogra, Dieter Suter, *et al.*, ArXiv:1702.02418.
 - (k) My article by Rui Li, Unai Alvarez-Rodriguez, Lucas Lamata and Enrique Solano, *Approximate Quantum Adders with Genetic Algorithms: An IBM Quantum Experience*, Quantum Meas. Quantum Metrol. **4**, 1 (2017), is a combination of theoretical proposal and its experimental implementation in the 5-transmon quantum computer provided by the facilities of IBM Quantum Experience.
2. Two of my papers published in Physical Review Letters were selected as Editor's Suggestion. PRL Editors select, in a two-stage process, approximately one out of each 6 Letters due to its particular importance, innovation, and broad appeal.

[According to APS](#), Suggestions are downloaded twice as often as the average Letter, and are covered in the press substantially more often. If they were collected in a separate publication, they would have an Impact Factor of 13.

My article *How Much Entanglement Can Be Generated between Two Atoms by Detecting Photons?*, done in collaboration with Ignacio Cirac and Juan José García-Ripoll, was, anecdotically, the first Suggestion of the history of PRL, in appearance order (first week of January, 2007).

3. Acreditación de Profesor Contratado Doctor (official qualification for holding the post of Spanish equivalent to Associate Professor, with tenure), ANECA, Spanish Ministry of Education, February 2015.
4. Ramón y Cajal Grant, Spanish Ministry of Economy (MINECO). Highly competitive, international, 5-year tenure-track Grant. 175 positions for all fields of knowledge in the 2012 call (22 in Physics, and overall 49 in basic sciences). I was ranked 5th in Physics, 1st in Quantum Optics and Quantum Information, and 11th in basic sciences, including Physics, Mathematics, Chemistry, and Earth Sciences, with a total score of 98.80 over 100. Acceptance rate around 6%.
5. Marie Curie IEF Postdoctoral Fellowship, European Commission, awarded December 2010 (acceptance rate: 18%; total score of my proposal: 91.3 over 100. Ranked 21st out of more than 300 applicants in the Physics panel).
6. Shortlisted for a permanent Lecturer position at Queen's University Belfast on December 2010. I declined the invitation for interview because of accepting the Marie Curie position at UPV/EHU Bilbao.
7. Acreditación de Profesor Ayudante Doctor (official qualification for holding the post of Spanish equivalent to Assistant Professor), ANECA, Spanish Ministry of Education, September 2010.
8. Max-Planck Postdoctoral Fellowship, Max-Planck-Institut für Quantenoptik, awarded December 2008.
9. Selected by Germany and Spain as a participant (category: Postdoctoral Researcher) in the Lindau Nobel Meeting-58th Meeting of Nobel Prize Winners in Physics, in Lindau, Lake Constance, Germany, Acceptance in April 2008. I was ranked 1st in the selection of the Spanish Confederation of Scientific Societies (COSCE). 9 candidates were selected by COSCE, of a total of 14 Spanish participants in the Meeting.
10. Extraordinary Prize for a PhD in Physics, Universidad Autónoma de Madrid, December 2007. I obtained the First Extraordinary Prize, among more than 30 theses defended in Physics.
11. Postdoctoral Fellowship from the Spanish Ministry of Education and Science (Awarded, not taken), August, 2007. I was ranked 1st in the Physics panel.
12. Humboldt Research Fellowship, Alexander von Humboldt Foundation, July, 2007. I was the first Humboldt Fellow to work in Prof. Ignacio Cirac's Group at the Max-Planck Institute for Quantum Optics, Garching, Germany.

13. *Ramón Areces* Postdoctoral Fellowship (Awarded, not taken), Fundación Ramón Areces, July, 2007. I obtained the Ramón Areces Postdoctoral Fellowship awarded in Physics in 2007. There were 20 in total for all scientific fields.
14. PhD Thesis awarded Sobresaliente *Cum Laude* (Highest qualification), April, 2007.
15. *Doctor Europeus* award, April, 2007.
16. FPU PhD Scholarship (Ministry of Education of Spain), January, 2004.
17. I3P PhD Scholarship (Awarded, not taken) (CSIC, Ministry of Science and Technology of Spain), January, 2004.
18. Undergraduate CSIC Scholarship (CSIC, Ministry of Science and Technology of Spain), September, 2003.
19. Finalist of I Certamen Arquímedes (National Contest of Undergraduate Researchers, Ministry of Education of Spain), December, 2002. I was the only Physics student in Spain selected for the final.
20. When I finished the High School, I studied two years of Aeronautical Engineering at the Escuela Técnica Superior de Ingenieros Aeronáuticos in Universidad Politécnica de Madrid, one of the engineering degrees in Spain with the most difficult access at the time. After two years in that degree I decided that my true vocation was to understand nature at a fundamental level, and specifically the physical world, and I changed to Physics studies.
21. High School (BUP and COU) with Honors, and maximum possible average in the 4 High School years (9.0 out of 9).

PARTICIPATION IN SCIENTIFIC SOCIETIES

1. **Society:** Real Sociedad Española de Física.
Participation:
 - (a) Student numerary member ('00/'05).
 - (b) Member of the Grupo Especializado de Información Cuántica ('05/...).
2. **Society:** Asociación Alexander von Humboldt de España.
Participation: Numerary member ('08/...).
3. **Society:** Marie Curie Alumni Association (MCAA).
Participation: Numerary member ('13/...).

4. **Society:** American Physical Society (APS).
Participation: Member ('10/'11 and '15-Today).

LANGUAGES

1. Spanish: mother tongue.
2. **Title:** Certificate in Advanced English (CAE, Cambridge).
Mark: Grade B.
Date: 2004.
3. Basic Level of German. Courses taken in Goethe Institut Madrid (06/07) and Universidad Complutense de Madrid (04/05). From 24th September 2007 until 23rd November 2007 I attended a two-month German course in Goethe Institute Munich covered by the Alexander von Humboldt Foundation. Private Lessons in Garching during 2010-2011, at Sprachenschule Doppelpunkt.

HOBBIES

Current hobbies:

1. Reading, mainly essay: politics, economy, history, also some science and literature.
2. Watching good cinema movies.
3. Traveling.
4. Artistic drawing.

Past hobbies:

1. I have the title of glider pilot (although not anymore an active license).
2. I built radiocontrol plane models, including a Piper Cub, and flew them in a radiocontrol club nearby Madrid.
3. I played classic and electric guitar for some years, practised windsurfing for 5 years, and danced Tango Argentino for more than one year, among other things.

August 2017
