

# CURRICULUM VITAE

JUAN JOSÉ GARCÍA-RIPOLL

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## PERSONAL DATA

Job address: Instituto de Física Fundamental  
Calle Serrano 113b, E-28006 Madrid  
España  
Phone: +34 628194767  
e-Mail: [jj.garcia.ripoll@csic.es](mailto:jj.garcia.ripoll@csic.es)  
www: [quinfog.iff.csic.es](http://quinfog.iff.csic.es)  
Birth: 1974-04-24 (Madrid, Spain)  
Nationality: Spanish  
Languages: Spanish (native), English, German



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## RESEARCH FIELDS

Quantum technologies, quantum computation, quantum simulation, trapped ions, superconducting quantum circuits, ultracold atoms

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## WORKING EXPERIENCE

2017-1 / today Professor, Instituto de Física Fundamental, CSIC.  
2017-1 / 2019-10 Coordination of grant proposal evaluations in the area of physics at the Spanish National Research Agency.  
2008-08 / 2016-12 Associate Professor, Instituto de Física Fundamental, CSIC.  
2006-12 / 2008-07 Associate researcher (Ramón y Cajal), Universidad Complutense de Madrid  
2003-11 / 2006-10 Associate researcher, Max-Planck Institute for Quantum Optics (MPQ), Garching, Germany  
2001-12 / 2003-10 Postdoct fellowship, MPQ  
2001-11 / 2001-11 Assistant researcher, University of Innsbruck, Austria  
1998-01 / 2001-05 Ph. D. Fellowship,

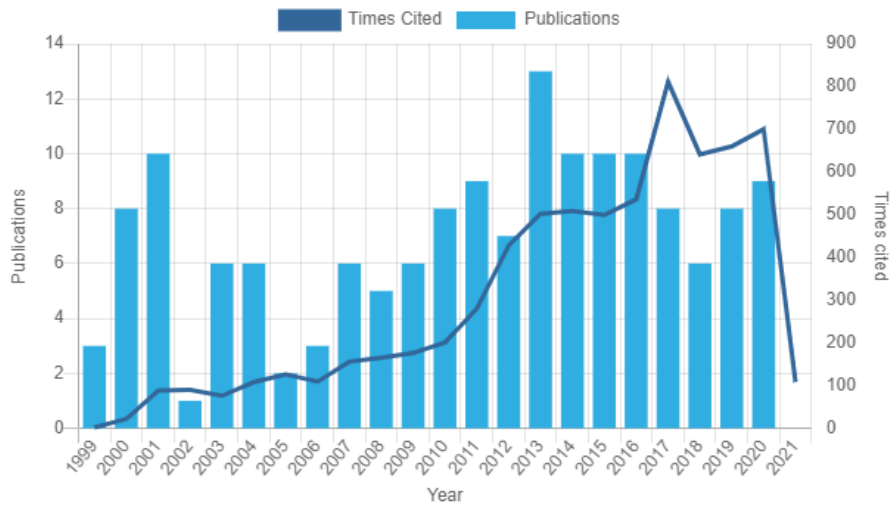
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## AWARDS

1. Visiting fellow, IQOQI-Innsbruck, 2019.
2. Outstanding referee, American Physical Society, 2017.
3. Ranked 1st in 2005 Ramon y Cajal National tenure track fellowships
4. Extraordinary Prize for a Ph. D. in the year 2001 Promotion
5. Extraordinary Prize for a Degree in the year 1997 Promotion

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## SUMMARY OF SCIENTIFIC CONTRIBUTIONS



Source: <https://publons.com/researcher/2885050/juan-jose-garcia-ripoll>

- More than 130 contributions to refereed journals, with an average of 47 citations per work. H-Index 42 (WoS) or 49 (Google Scholar); total citations between 6993 (WoS) and 10398 (Google).
- About 25 invited seminars, 37 invited talks to scientific conferences.
- Organizer of 9 international conferences.
- Supervised or co-supervised 4 PhD thesis, 8 MSc thesis and 6 postdocs.

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## MANAGEMENT, COMMITTEES AND REFERRALS

- Spanish representative (Sherpa) at the European Quantum Communication Initiative.
- Coordinator of CSIC's Platform on Quantum Technologies QTPEP (<https://qtep.csic.es>).
- Coordinator of project and grant proposal evaluation for the physics area at the National Science Agency in Spain (2017-2019).
- President of the Group on Quantum Information from the Spanish Royal Physical Society (2016-2019).
- Project evaluator for: AEI (España), DFG (Germany), FWF (Austria), CONICYT/FONDECYT (Chile), NSF (USA), SNF (Suiza).
- Referee for: Nature, Nature Communications, Physical Review X, Physical Review Letters, New Journal of Physics, Physical Review A, Physica B, Optics Express, Europhysics Letters, Proceedings of the Royal Society A, Quantum Information and Communication.

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## PROJECTS

- 2020 / 2022 *SuperQuLAN*  
FET-Open project  
Juan José García-Ripoll (IP)  
TU Vienna, CSIC, ETHZ, Zurich Inst., MPQ.
- 2020 / 2022 *Avaqus*  
FET-Open project  
Juan José García-Ripoll (IP)  
IFAE, CSIC, Univ. Glasgow, KIT, CNRS, HQS Simulations, Qilimanjaro.
- 2020 / 2021 *Red de Información y Tecnologías Cuánticas*  
Programa Estatal de Fomento de la Investigación Científica y Técnica de Excelencia, RED2018-102707-E  
Juan José García-Ripoll  
CSIC, 60.000 euros.
- 2018 / 2019 *COBOSAM Correlated Boson Sampling Metrology*  
AFOSR/JA Assian Office Of Aerospace R&D  
Juan José García-Ripoll  
CSIC, \$50.000.
- 2017 / 2018 *Red de Información y Tecnologías Cuánticas*  
Programa Estatal de Fomento de la Investigación Científica y Técnica de Excelencia, FIS2016-81891-REDT  
Juan José García-Ripoll  
CSIC, 30.000 euros.
- 2016 / 2018 *Tecnologías cuánticas con qubits y campos*  
Programa Estatal de Fomento de la Investigación Científica y Técnica de Excelencia, FIS2015-70856-P  
Juan José García-Ripoll  
CSIC, 84.200 euros.
- 2013 / 2015 *Tecnologías de la información cuántica con átomos, moléculas y circuitos*  
Plan Nacional de Investigación Fundamental no Orientada, FIS2012-33022  
Juan José García-Ripoll  
CSIC, 102.960 euros.
- 2012 / 2015 *PROMISCE: Propagating Microwaves in Strongly Coupled Environments*  
FET-Open STREP project  
Juan José García-Ripoll (Coord.)  
CSIC, UPV-EHU, Chalmers, TU Munich / WMI.
- 2011 / 2014 *IOTA: Ion Traps for Tomorrow's Applications*  
Ref: COST MP1001, COST Networks  
M. Knoop (Chair), Juan José García-Ripoll (Spanish Committee Member)  
15 EU Countries.
- 2010 / 2015 *POLATOM*  
ESF Research Networking Programme  
G. M. Kavoulakis (Coordinator), Juan José García-Ripoll (PI at CSIC)  
12 EU Countries.
- 2010 / 2012 *MOLOPTLAT - Molecule formation and quantum correlation in optical lattices*  
FP7 PEOPLE Programme (FP7-PEOPLE-2009-IEF-251913)  
J. Mur-Petit (M. Curie Postdoc), J. J. García-Ripoll (Supervisor)  
CSIC
- 2010 / 2013 *QUITEMAD - Quantum Information Technologies in Madrid*, Plan PRICIT, Comunidad Autónoma de Madrid,

M. A. Martín-Delgado (Coord.)  
UCM, UC3M, UPM, CSIC

- 2009 / 2011 *Información cuántica y sistemas fuertemente correlacionados*  
Ref. FIS2009-10061, Proyectos de Investigación Fundamental, MICINN  
M. A. Martín-Delgado (PI)  
Univ. Complutense, CSIC
- 2008 / 2009 *Información cuántica: implementaciones físicas*  
Ref. 200850I044, Proyectos Intramurales, CSIC  
J. J. García-Ripoll (PI)
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#### RESEARCH VISITS

- 2017-04-02 / 04-22 IQOQI (Innsbruck, AT).
- 2016-02-01 / 03-11 IQOQI (Innsbruck, AT).
- 2015-10-05 / 30 Kavli Institute of Theoretical Physics, (Santa Barbara, US).
- 2013-08-25 / 30 University of Chalmers (SE)
- 2011-02-13 / 24 University of Leeds (UK)
- 2010-04-18 / 05-16 Max-Planck Institute of Quantum Optics, Garching by Munich (DE)
- 2010-03-25 / 03-26 Universidad de Barcelona (ES)
- 2007-04-21 / 05-25 Kavli Institute for Theoretical Physics, Santa Barbara (USA)
- 2007-02-25 / 03-02 Universidad Autónoma de Barcelona (ES)
- 2007-01-22 / 02-02 DAMTP, University of Cambridge (UK)
- 2000-05-01 / 05-13 Universidad de Lisboa (PT)
- 1999-11 Optical Sciences Center, Australian National University Canberra (AU)
- 1998-10 Theoretical Physics Institute, Univ. of Innsbruck (AT)
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#### INVITED SEMINARS, COLLOQUIA

- 2020-07-02 *Superconducting Quantum Circuits*, Optical Society of America Webinars (USA).
- 2017-10-06 *Quantum Microwave Photonics*, Niels Bohr Institute, Copenhagen (DK).
- 2017-06-28 *Ultrastrong light-matter interactions*, Imperial College, London (UK).
- 2017-08-24 *Microwave photonics: from ultrastrong coupling to scattering tomography*, Walther-Meissner-Institut, Garching (DE).
- 2016-12-21 *Ultrastrong light-matter interaction with propagating photons*, Néel Institute, Grenoble (FR).
- 2016-10-14 *Ultrastrong light-matter interaction with propagating photons*, Dept. of Physics, Univ. of Oxford (UK).
- 2016-06-01 *Microwave photonics*, Institute of Microelectronics in Madrid IMM-CNM-CSIC, Madrid (ES).
- 2015-12-15 *Spin-boson model: from microwave photonics to quantum magnetism* University of Leeds, Leeds (UK).
- 2015-06-11 *Spin-boson model: from microwave photonics to quantum magnetism* Johannes-Gutenberg-Universität, Mainz (DE).

2013-08-28	<i>Ultrastrong coupling in propagating microwave photons</i> , University of Chalmers, Gothenborg (SE).
2013-08-21	<i>Trapped ion quantum-gate technologies</i> , University of Hannover, Hannover (DE).
2013-05-14	<i>Información y computación cuánticas</i> , Universidad de Granada (ES).
2012-06-12	<i>Temperature-independent quantum logic for molecular spectroscopy</i> , PTB, Braunschweig (DE).
2011-10-19	<i>Seeing topological order in ultracold atoms</i> , University of Leeds, Leeds (UK).
2011-02-23	<i>Superconducting quantum circuits</i> , University of Leeds, Leeds (UK).
2011-02-02	<i>Superconducting quantum circuits</i> , Universidad Autónoma de Madrid.
2010-05-31	<i>Quantum Information processing with superconducting circuits</i> , Universidad de Zaragoza.
2010-03-23	<i>Strong and ultrastrong interactions in circuit-QED</i> , Universidad de Barcelona.
2009-04-30	<i>Strong correlations in optical lattices</i> , ICMM-CSIC, Madrid.
2008-06-13	<i>Strong correlations in optical lattices</i> , Univ. de las Islas Baleares, Mallorca.
2007-11-28	<i>Quantum simulation with superconducting qubits</i> , Ludwig-Maximilian University, Munich (DE).
2007-10-26	<i>Pairing of bosonic atoms induced by optical lattices</i> , ICFO, Castelldefells
2007-05-19	<i>Ultracold atoms: Quantum Simulation and Computation</i> , IFF-CSIC, Madrid
2007-05-07	<i>Matrix Product States</i> , IFF-CSIC, Madrid.
2007-05-01	<i>Melting of an entangled Mott-insulator</i> , Universidad Autónoma de Barcelona.
2006-02-17	<i>Numerical algorithms for the simulation of cold atoms in optical lattices</i> , University of Stuttgart (DE)
2005-09-07	<i>Cold atoms: from Quantum Information to Condensed Matter Physics</i> Universidad Autónoma de Barcelona (ES)
2005-02-08	<i>Matrix Product States with Applications</i> University of Stuttgart (DE)
2004-04-01	<i>Cold atoms: from Quantum Information to Condensed Matter Physics</i> LPTMS, Orsay (FR)
2004-10-13	<i>Coherent control of Trapped Ions using off-resonant light</i> Institute for Theoretical Physics, University of Innsbruck (AT)
2003-10-20	<i>Speed limits for Quantum Computing with Trapped Ions</i> E. T. H. Zürich (SW)
2003-01-22	<i>Quantum Control and Quantum Computing</i> Institute for Theoretical Physics, University of Innsbruck (AT)

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## SUPERVISION AND TEACHING

### THESIS

2012- 2017	Tesis de doctorado: <i>Entanglement and Correlations in Quantum Many-body Systems</i> , Andrea Cadarso Rebolledo, co-supervised by J. J. García-Ripoll y D. Pérez-García, Univ. Complutense (ES), sobresaliente cum-laude.
2010 - 2014	Tesis de doctorado: <i>Measuring entanglement and topology in optical lattices</i> Emilio Alba Linero, Univ. Complutense (ES), sobresaliente cum-laude.

2009 – 2013                    Tesis de doctorado:  
*Control of ultrastrongly coupled systems in circuit quantum electrodynamics*  
Borja Peropadre López, Univ. Complutense (ES), sobresaliente cum-laude

#### UNIVERSITY TEACHING AND SPECIALIZED SCHOOLS

2016–02-01/28                *Microwave Quantum Photonics*  
Master and PhD course, 2,5 E.C.T.S  
University of Innsbruck / IQOQI (AT)

2014 / 2017                    *Quantum Simulation*  
Shared teaching in master course, 12 h / 2 E.C.T.S per year  
Facultad de Físicas, Univ. Complutense de Madrid (ES)

2007 / 2013                    *Información y Computación Cuánticas*  
Shared teaching in master course, 12 h / 2 E.C.T.S per year  
Facultad de Físicas, Univ. Complutense de Madrid (ES)

2011–07–19                    *Computación cuántica*  
Curso de verano Fronteras de la Computación  
Centro de Ciencias de Benasque (ES)

2011–07–11/15                *Un paseo por las fronteras de la ciencia*  
Curso de verano Universidad de Málaga,  
Organizado por Emilio Alba Conejo y J.J.G.R  
Archidona (ES).

2009–04                        *Quantum Information and Computation*  
Master course, 18 h  
Univ. Autónoma de Barcelona (ES)

2008–07                        *Computación e Información Cuánticas*  
Curso de El Escorial, Tendencias Actuales de la Matemática Interdisciplinar  
El Escorial (ES)

2000 / 2001                    *Numerical Analysis*  
Full teaching, 60 h  
E.T.S.I. Industriales, Univ. de Castilla–La Mancha, Ciudad Real (ES)

1998 / 1999                    *Numerical Analysis*  
Shared teaching, 30 h  
E.T.S.I. Industriales, Univ. de Castilla–La Mancha, Ciudad Real (ES)

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#### PUBLICATIONS

##### PATENTS

1. *Detector de fotones en el rango de microondas y método de detección*, J. J. García-Ripoll (CSIC), G. Romero (USACH), E. Solano (UPV-EHU), Ref. #200892933, 2008–10–17, Spain

##### PEER-REVIEWED PAPERS

1. *Projected Entangled Pair States: Fundamental Analytical and Numerical Limitations*, G. Scarpa, A. Molnár, Y. Ge, J. J. García-Ripoll, N. Schuch, D. Pérez-García, and S. Iblisdir, Phys. Rev. Lett. 125, 210504 (2020).
2. *Quantum Control of Frequency-Tunable Transmon Superconducting Qubits*, J. J. García-Ripoll, A. Ruiz-Chamorro, E. Torrontegui, Phys. Rev. Appl. 14, 044035 (2020).
3. *Seeing topological edge and bulk currents in time-of-flight images*, A. Rubio-García, C. N. Self, J. J. García-Ripoll, J. K Pachos, Phys. Rev. B 102, 041123 (2020).

4. *Topological bulk states and their currents*, C. N. Self, A. Rubio-García, J. J. García-Ripoll, J. K Pachos, Phys. Rev. B 102, 045424 (2020).
5. *Qubit-photon corner states in all dimensions*, A. Feiguin, J. J. García-Ripoll, A. González-Tudela, Phys. Rev. Research 2 (2), 023082 (2020).
6. *Mediator-assisted cooling in quantum annealing*, M. Pino, J. J. García-Ripoll, Phys. Rev. A 101 (3), 032324 (2020).
7. *Fast High-Fidelity Quantum Nondemolition Qubit Readout via a Nonperturbative Cross-Kerr Coupling*, R. Dassonneville, T. Ramos, V. Milchakov, L. Planat, É. Dumur, F. Foroughi, J. Puertas, S. Leger, K. Bharadwaj, J. Delaforce, C. Naud, W. Hasch-Guichard, J. J. García-Ripoll, N. Roch, O. Buisson, Phys. Rev. X 10 (1), 011045 (2020).
8. *Quantum Simulation of Non-Perturbative Cavity QED with Trapped Ions*, T. Jaako, J.J. Garcia-Ripoll, P. Rabl, Advanced Quantum Technologies 3 (4), 1900125 (2020).
9. *Modulated Continuous Wave Control for Energy-Efficient Electron-Nuclear Spin Coupling*, J. Casanova, E. Torrontegui, M. B. Plenio, J. J. García-Ripoll, E. Solano, Phys. Rev. Lett. 122, 010407 (2019).
10. *Ultrastrong-coupling circuit QED in the radio-frequency regime*, T. Jaako, J. J. García-Ripoll, P. Rabl, Phys. Rev. A 100 (4), 043815 (2019).
11. *Single photons by quenching the vacuum*, E. Sánchez-Burillo, L. Martín-Moreno, J. J. García-Ripoll, D. Zueco, Phys. Rev. Lett. 123 (1), 013601 (2019).
12. *Unitary quantum perceptron as efficient universal approximator*, E. Torrontegui, J. J. García-Ripoll, EPL 125, 30004 (2019).
13. *Ultrastrongly dissipative quantum Rabi mode*, D. Zueco and J. J. García-Ripoll, Phys. Rev. A 99, 013807 (2019).
14. *Quantum annealing in spin-boson model: form a perturbative to an ultrastrong mediated coupling*, New J. Phys. 20, 113027 (2019).
15. *Correlated dephasing noise in single-photon scattering*, T. Ramos and J. J. García-Ripoll, New J. Phys. 20, 105007 (2019).
16. *Ultrastrong coupling few-photon scattering theory*, T. Shi, Y. Chang and J. J. García-Ripoll, Phys. Rev. Lett. 120, 153602 (2018).
17. *Emergent causality and the N-photon scattering matrix in waveguide QED*, E. Sánchez-Burillo, A. Cadarso, L. Martín-Moreno, J. J. García-Ripoll, D. Zueco, New J. Phys. 20, 013017 (2018).
18. *Quantum probe of an on-chip broadband interferometer for quantum microwave photonics*, Supercond. Sci. Technol. 31, 115002 (2018).
19. *Quantum emulation of molecular force fields: A blueprint for a superconducting architecture*, D. G. Olivares, B. Peropadre, J. Huh, J. J. García-Ripoll, Phys. Rev. Appl. 8, 064008 (2017).
20. *Multiphoton scattering tomography with coherent states*, T. Ramos, J. J. García-Ripoll, Phys. Rev. Lett. 119, 153601 (2017).
21. *Coherent manipulation of three-qubit states in a molecular single-ion magnet*, M. D. Jenkins, Y. Duan, B. Diosdado, J. J. García-Ripoll, A. Gaita-Arino, C. Giménez-Sáiz, P. J. Alonso, E. Coronado, F. Luis, Phys. Rev. B. **95**, 064423 (2017).
22. *Dynamical signatures of bound states in waveguide QED*, E. Sánchez-Burillo, D. Zueco, L. Martín-Moreno, J. J. García-Ripoll, Phys. Rev. A **96**, 023831 (2017).
23. *Equivalence between spin Hamiltonians and boson sampling*, B. Peropadre, A. Aspuru-Gúzik, J. J. García-Ripoll, Phys. Rev. A **95**, 032327 (2017).
24. *Quantum Estimation Methods for Quantum Illumination*, M. Sanz, U. Las Heras, J. J. García-Ripoll, E. Solano, R. Di Candia, Phys. Rev. Lett. **118**, 070803 (2017).

25. *Ultrastrong coupling of a single artificial atom to an electromagnetic continuum in the nonperturbative regime*, P. Forn-Díaz, J. J. García-Ripoll, B. Peropadre, *et al.*, Nat. Phys. **13**, 39-43 (2017).
26. *One- and two-photon scattering from generalized V-type atoms*, E. Sánchez-Burillo, L. Martín-Moreno, D. Zueco, J. J. García-Ripoll, Phys. Rev. A **94**, 053857 (2016).
27. *Quantum simulation with a boson sampling circuit*, D. González Olivares, B. Peropadre, A. Aspuru-Guzik, J. J. García-Ripoll, Phys. Rev. A **94**, 022319 (2016).
28. *Full two-photon down-conversion of a single photon*, E. Sanchez-Burillo, L. Martin-Moreno, J. J. García-Ripoll, D. Zueco, Phys. Rev. A **94**, 053814 (2016).
29. *Ultrastrong coupling in two-resonator circuit QED*, A. Baust, E. Hoffmann, M. Haeberlein *et al.*, Phys. Rev. B. **93**, 214501 (2016).
30. *Ultrastrong coupling phenomena beyond the Dicke model*, T. Jaako, Z.-L. Xiang, J. J. García-Ripoll, P. Rabl, Phys. Rev. A **94**, 033850 (2016).
31. *Dynamical polaron Ansatz: A theoretical tool for the ultrastrong coupling regime in circuit QED*, G. Díaz-Camacho, A. Bermúdez, J. J. García-Ripoll, Phys. Rev. A **93**, 043843 (2016)
32. *Topological phases of shaken quantum Ising lattices*, S. Fernández-Lorenzo, J. J. García-Ripoll, D. Porras, New J. Phys. **18**, 023030 (2016)
33. *Winding number order in the Haldane model with interactions*, E. Alba, J. K. Pachos, J. J. García-Ripoll, New J. Phys. **18**, 033022 (2016)
34. *Driven spin-boson Luttinger liquids*, A. Kurcz, J. J. García-Ripoll, A. Bermúdez, New J. Phys. **17**, 115011 (2015)
35. *Light-matter decoupling and  $A^2$  term detection in superconducting circuits*, J. J. García-Ripoll, B. Peropadre, S. De Liberato, Sci. Rep. **5**, 16055 (2015)
36. *Measuring molecular electric dipoles using trapped atomic ions and ultrafast laser pulses*, J. Mur-Petit, J.J. Garcia-Ripoll, Phys. Rev. A **91**, 012504 (2015).
37. *Scattering in the ultrastrong regime: nonlinear optics with one photon*, E. Sánchez-Burillo, D. Zueco, J. J. García-Ripoll, L Martín-Moreno, Physical Review Letters **113**, 263604 (2014).
38. *Continuous matrix product states for coupled fields: Application to Luttinger liquids and quantum simulators*, F. Quijandría, J. J. García-Ripoll, D. Zueco, Physical Review B **90**, 235142 (2014).
39. *Inducing nonclassical lasing via periodic drivings in circuit quantum electrodynamics*, C. Navarrete-Benlloch, J. J. García-Ripoll, D. Porras, Physical review letters **113**, 193601 (2014).
40. *The Bose Hubbard model with squeezed dissipation*, F. Quijandría, U. Naether, D. Porras, J. J. García-Ripoll, D. Zueco, J. Phys. B **48**, 055302 (2015).
41. *Detection of Chern numbers and entanglement in topological two-species systems through subsystem winding numbers*, J. de Lisle, Suvabrata De, E. Alba, A. Bullivant, J. J. Garcia-Ripoll, V. Lahtinen, J. K. Pachos, New J. Phys. **16**, 083022 (2014)
42. *Collective modes of a trapped ion-dipole system*, J. Mur-Petit, J. J. García-Ripoll, Appl. Phys. B **114**, 283–294 (2014)
43. *Entanglement detection in coupled particle plasmons*, J. del Pino, J. Feist, F. J. García-Vidal, J. J. García-Ripoll, Phys. Rev. Lett. **111**, 216805 (2014).
44. *Hybrid quantum magnetism in circuit-QED: from spin-photon waves to many-body spectroscopy*, A. Kurcz, A. Bermudez, J. J. García-Ripoll, Phys. Rev. Lett. **112**, 180405 (2014)
45. *Lattice scars: Surviving in an open discrete billiard*, V. Fernández-Hurtado, J. Mur-Petit, J. J. García-Ripoll, R. A. Molina, New J. Phys. **16**, 035005 (2014)



46. *Phase Stabilization of a Frequency Comb using Multipulse Quantum Interferometry*, A. Cadarso, J. Mur-Petit, J. J. García-Ripoll, Phys. Rev. Lett. **112**, 073603 (2014).
47. *Quantum chaos in an ultra-strongly coupled bosonic junction*, U. Naether, J. J. García-Ripoll, J. J. Mazo, D. Zueco, Phys. Rev. Lett. **112**, 074101 (2014).
48. *Bose-Hubbard models with photon pairing in circuit-QED*, B. Villalonga-Correa, A. Kurcz, J. J. García-Ripoll, J. Phys. B. **46**, 224024 (2013).
49. *Circuit QED bright source for chiral entangled light based on dissipation*, F. Quijandría, D. Porrás, J. J. García-Ripoll, D. Zueco, Phys. Rev. Lett. **111**, 073602 (2013).
50. *Coupling single molecule magnets to quantum circuits*, M.D. Jenkins, T. Hümmer, M. J. Martínez-Pérez, J. García-Ripoll, D. Zueco, F. Luis, New J. Phys. **15**, 095007 (2013).
51. *From Josephson junction metamaterials to tunable pseudo-cavities*, D. Zueco, C. Fernández-Juez, J. Yago, U. Naether, B. Peropadre, J. J. García-Ripoll, J. J. Mazo, Supercond. Sci. Technol. **26**, 074006 (2013)
52. *Generating and verifying graph states for fault-tolerant topological measurement-based quantum computing in two-dimensional optical lattices*, J. Joo, E. Alba, J. J. García-Ripoll, T. P. Spiller, Phys. Rev. A **88** 012328 (2013).
53. *Hall response of interacting bosonic atoms in strong gauge fields: From condensed to fractional-quantum-Hall states*, H Pino, E Alba, J Taron, JJ Garcia-Ripoll, N Barberán, Phys. Rev. A **87** 053611 (2013)
54. *Lieb-Robinson bounds for spin-boson lattice models and trapped ions*, J Juenemann, A Cadarso, D Perez-Garcia, A Bermudez, J. J. García-Ripoll, Phys. Rev. Lett. **111**, 230404 (2013)
55. *Nonequilibrium and Nonperturbative dynamics of ultrastrong coupling in open lines*, B. Peropadre, D. Zueco, D. Porrás, J. J. García-Ripoll, Phys. Rev. Lett. **111**, 243602 (2013).
56. *Scattering of coherent states on a single artificial atom*, B. Peropadre, J. Lindkvist, I.-C. Hoi, C. M. Wilson, J. J. García-Ripoll, P. Delsing, G. Johansson, New J. Phys. **15**, 035009 (2013)
57. *Seeing Majorana fermions in time-of-flight images of spinless fermions coupled by s-wave pairing*, J. K. Pachos, E. Alba, V. Lahtinen, J. J. García-Ripoll, Phys. Rev. A **88**, 013622 (2013)
58. *Simulating Dirac fermions with Abelian and non-Abelian gauge fields in optical lattices*, E. Alba, X. Fernandez-Gonzalvo, J. Mur-Petit, J. J. Garcia-Ripoll, Jiannis K. Pachos, Annals of Physics **328**, 64-82 (2013)
59. *Tunable coupling engineering between superconducting resonators: From sidebands to effective gauge fields*, B. Peropadre, D. Zueco, F. Wulschner, F. Deppe, A. Marx, R. Gross, J. J. García-Ripoll, Phys. Rev. B **87**, 134504 (2013)
60. *Microwave photonics with Josephson junction arrays*, David Zueco, Juan José Mazo, Enrique Solano, Juan José García-Ripoll, Phys. Rev. B **86**, 024503 (2012).
61. *Quantum tomography in position and momentum space*, J. Casanova, C. E. Lopez, J. J. Garcia-Ripoll, C. F. Roos, E. Solano, Eur. Phys. J. D. **66**, 222 (2012)
62. *Encoding relativistic potential dynamics into free evolution*, C. Sabín, J. Casanova, J. J. García-Ripoll, L. Lamata, E. Solano, J. León, Phys. Rev. A **85**, 052301 (2012)
63. *Quantum Simulation of Quantum Field Theories in Trapped Ions* J. Casanova, L. Lamata, I. L. Egusquiza, R. Gerritsma, C. F. Roos, J. J. Garcia-Ripoll, E. Solano, Phys. Rev. Lett. **107**, 260501 (2011).
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74. *Detecting ground state qubit self-excitations in circuit QED: slow quantum anti-Zeno effect*, C. Sabín, J. León, J. J. García-Ripoll, Phys. Rev. B **84**, 024516 (2011)
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95. *Quantum Ratchets for Quantum Communication with Optical Superlattices* O. Romero-Isart, J. J. García-Ripoll, Phys. Rev. A **76**, 052304 (2007)
96. *Fragmentation and destruction of the superfluid due to frustration of cold atoms in optical lattices* J. J. García-Ripoll, J. Pachos, New J. Phys. **9** 139 (2007)
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103. *Matrix Product Density Operators: Simulation of finite-T and dissipative systems* F. Verstraete, J. J. García-Ripoll, J. I. Cirac, Phys. Rev. Lett. **93**, 207204 (2004).
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129. *Barrier resonances in Bose-Einstein condensation* J. J. García-Ripoll & V. M. Pérez-García, Phys. Rev. A **59**, 2220 (1999).

#### BOOKS, PROCEEDINGS AND REVIEWS

1. *Quantum information processing with cold atoms and trapped ions* J. J. García-Ripoll, P. Zoller & J. I. Cirac, Lectures on Quantum Information, D. Bruß & G. Leuchs. Eds., Wiley-VCH, (2007) 978-3-527-40527-5
2. *Quantum information processing with cold atoms and trapped ions* J. J. García-Ripoll, P. Zoller & J. I. Cirac, J. Phys. B **38** S567-S578 (2005)
3. *Implementing quantum information processing with atoms, ions and photons* P. Zoller, J. I. Cirac, Luming Duan, J. J. García-Ripoll Quantum Entanglement and Information Processing, (Les Houches Summer School, 2003), D. Estève, J.-M. Raimond and J. Dalibard Eds. Elsevier (2004).
4. *Strong correlation effects and quantum information theory of low dimensional atomic gases* B. Paredes, J. J. García-Ripoll, P. Zoller, J. I. Cirac Quantum Gases in Low Dimensions (Les Houches Summer School 2003), J. Phys. IV France, **116** (2004).
5. *PROPAGATING FIELDS Light molecules: dipole-mode vector solitons* W. Krolikowski, B. Luther-Davies, G. McCarthy, M. Geisser, Y. S. Kivshar, E. A. Ostrovskaya, C. Weillnau, C. Denz, J. J. García-Ripoll, V. M. Pérez-García Optics and Photonics News (2000).
6. *Scattering of light by molecules of light* J. J. García-Ripoll, V. M. Pérez-García, W. Krolikowski, G. McCarthy, B. Luther-Davies, D. Neshev, E. Ostrovskaya & Y. Kivshar. OSA Technical Digest (Optical Society of America, Washington DC, 2001), pp. 455-457, ISBN 1-55752-670-2.
7. *Multipole optical vector solitons* A. S. Desyatnikov, D. Neshev, Y. S. Kivshar, E. A. Ostrovskaya, W. Krolikowski, B. Luther-Davies, J. J. García-Ripoll, V. M. Pérez-García. OSA Technical Digest (Optical Society of America, Washington DC, 2001), pp. 458-460, ISBN 1-55752-670-2.

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#### CONFERENCES ORGANIZATION

1. *Quantum Simulation and Computation 2019*, Madrid (ES), 2019-10-14/19.
2. *Quantum Science: Implementations*, Benasque (ES), 2018-06-25 / 07-13.
3. *Quantum Simulation and Computation 2018*, Bilbao (ES), 2018-02-12/16.
4. *Información Cuántica en España, ICE-4*, Madrid (ES), 2017-07-10/14.
5. *Numerical Methods for Quantum Optics*, Madrid 2017-01-26 / 27.
6. *Quantum Science: Implementations*, Benasque (ES), 2016-06-29 / 07-10.
7. *Información Cuántica en España, ICE-3*, Mallorca (ES) 2016-4-13 / 15.
8. *Quantum Science: Implementations*, Benasque (ES), 2014-06-29 / 07-19.

9. *Información Cuántica en España, ICE-0*, Madrid (ES) 2012.
  10. *18th Central European Workshop on Quantum Optics*, Madrid (ES) 2011-05-30 / 06-03.
  11. *Theory of Quantum Computation, Communication and Cryptography*, Madrid (ES) 2011-05-24 / 26.
  12. *Benasque Workshop on Quantum Simulation*, Centro de Ciencias de Benasque (ES), 2011-02-28 / 03-05.
  13. *Workshop Circuit QED for Quantum Information*, UPV/EHU, Bilbao (ES), 2009-08-5/7
  14. *Quantum Information and Solid-State Systems*, Bilbao (ES), 2009-08-5/7
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## INVITED TALKS

1. *Multi-photon processes in waveguide-QED*, invited talk, Quantum Emitters in Non-Conventional Baths, 2019-01-14/16, Garching bei München, Alemania.
2. *Nonequilibrium physics in superconducting microwave photonics*, invited talk, New Trends in Complex Quantum Systems Dynamics, 2019-04-06/10, Venecia, Italia.
3. *From quantum computing to quantum-inspired computations*, invited talk, Quantum Technologies: Academia Meets Industry, 2019-09-21/22, Shanghai, China.
4. *From Quantum Computing to Quantum Inspired Algorithms*, invited talk, Mission 1000 – Quantum Science and Technologies, 2019-10-22/24, INL, Braga, Portugal.
5. *Few photon physics in superconducting circuits*, invited talk, Quantum Simulation and Quantum Devices 2019, 2019-11-18/23, Beijing, China.
6. *Qubit-photon corner states and other ultrastrong coupling physics*, invited talk, 1st Workshop on Molecular Quantum Technology (MQT 2019), 2019-12-16/20, Puerto Natales, Chile.
7. *Single and multiphoton scattering in the ultrastrong coupling regime*, invited talk, Waveguide QED, 2018-06-04/08, Mazara del Vallo (IT).
8. *Quantum Microwave Photonics with Superconducting Circuits*, invited talk, Central European Workshop on Quantum Optics, 2018-05-21/25, Mallorca (ES).
9. *Ultrastrong coupling with propagating photons*, invited talk, Workshop on quantum light-matter interactions in low dimensions, 2017-05-8/12, ICFO (ES).
10. *Ultrastrong light-matter interaction*, invited talk, New Trends in Complex Quantum Systems Dynamics, 2017-05-8–12, Cartagena (ES).
11. *Microwave Quantum Photonics*, invited talk, Información Cuántica en España, ICE-3, 2016-04-13/15, Mallorca (ES).
12. *Quantum simulation with microwave quantum photonics*, invited talk, PQE 2016, 2016-1-3/8, Snowbird / Utah (US).
13. *Superconducting circuit microwave photonics*, invited talk, Light-matter interactions in low dimensions, ITAMP workshop 2015-06-28, Cambridge (US).
14. *DMRG studies of Quantum Optics*, invited talk, Workshop and Symposium on DMRG Technique for Strongly Correlated Systems in Physics and Chemistry, 2015-06-22/27, Natal (Brasil).
15. *Winding number in interacting Haldane model*, invited talk, 17th Symposium on Topological Quantum Information, 2015-04-16/17, Garching (Munich) (DE).
16. *Light-matter interactions in superconducting circuits*, Advanced Many-body and Statistical Methods in Mesoscopic Systems II, 2014-09-01/09, Brasov (RO).



17. *Lieb-Robinson bounds for trapped ions*, 1st Workshop on Quantum Simulations with Trapped Ions (IQsim13), 2013-12-16/19, Brighton (UK).
18. *Scattering of Photons and Limits of Ultrastrong Light-matter Coupling in Open Transmission Lines*, PIERS 2013 Stockholm (SE)
19. *Quantum Computation with Circuit QED Systems*, CLEO, 2013-08-08, San Jose, (USA).
20. *Quantum simulation and detection of topological order*, New Trends in Complex Quantum System Dynamics, 2013-04-11, Cartagena (ES).
21. *Quantum simulation with atoms and circuits*, Workshop on Quantum Simulations II, 2012-10-22–25, Bilbao (ES).
22. *Propagating microwave photons in superconducting circuits*, Quantum Technologies III, 2012-09-9–15, Warsaw (PL).
23. *Topología en átomos ultrafríos*, Nolineal 2012, Zaragoza (ES).
24. *Temperature independent quantum logic for molecular spectroscopy*, Iota-COST workshop on cold molecular ions, 2011–09–23/25, Sandjberg (DK).
25. *Quantum Simulation and Quantum Logic Spectroscopy with Trapped ions*, QIon 2011–04–26/29, Madrid (ES).
26. *Quantum Simulation and Computation with Trapped ions*, IOTA Kick-off Meeting, 2011–03–23/25, Heidelberg (DE).
27. *Strong and Ultrastrong coupling in circuit-QED*, Solid, Bilbao (ES), 2010-02-8/12
28. *Microwave Photon Detection in circuit-QED* Consolider QOIT Meeting, 2009-02-02/03, Madrid (ES).
29. *Pairing and entanglement of bosonic atoms* ESF Quantum Optics conference, 2008-02-24 / 03-01, Obergurgl (AT)
30. *Ground state cooling of cold atoms in optical lattices* Cooling and thermodynamics of quantum systems, 2007-08-24/31 Safed (IL).
31. *Cold atoms for quantum information and simulation* Quantum Information Workshop, MaCS 06 Conference, 2006-06-12/15 Pecs (HU).
32. *Coherent control of trapped ions using off-resonant lasers* Minerva Workshop on Quantum Atom Optics, 2005-10-30/11-03, Eilat (IL).
33. *Coherent control of trapped ions using off-resonant lasers* Obergurgl Quantum Optics Conference, 2005-02-27 / 03-03 Obergurgl (AT).
34. *Speed optimized 2-qubit gates with laser coherent control techniques* International Conference on Quantum Optics (ICQO) 2004-05-28 / 06-11, Minsk (BY).
35. *ECL: Embeddable Common-Lisp* International Lisp Conference 2002-11-27/30 San Francisco (U. S. A.).

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#### OTHER CONTRIBUTIONS TO CONFERENCES

1. *Two-photon Scattering in USC regime*, APS March Meeting, 2019-03-04/8, Boston (US).
2. *Universal Quantum Neural Networks as efficient unitary operations*, Quantum Machine Learning & Biomimetic Quantum Technologies, 2018-03-19/23 Bilbao (ES).
3. *Multiphoton Scattering Tomography with Coherent States*, APS March Meeting, 2018-03-5/9, Los Angeles (US).

4. *Scattering theory in the ultrastrong coupling regime*, APS March Meeting, 2017-03-13/17, New Orleans (US).
5. *Spin models and boson sampling*, APS March Meeting, 2016-03-14/18, Baltimore (US).
6. *Topological phases in the Haldane model with interactions*, poster, BEC 2015 Conference: Frontiers in Quantum Gases, 2015-09-5/11 Sant Feliu (ES).
7. *Light-matter decoupling and A2 term detection in superconducting circuits*, APS March Meeting, 2015-3-03/07, in San Antonio, Texas (US).
8. *Quantum simulations of strongly correlated spin-boson models*, Quantum Simulations, 2015-02-22/27, Benasque (ES).
9. *Simulating atoms and photons with circuits*, 2nd International Workshop on Quantum Coherence and Decoherence (IWQCD2), 2014-08-25/29, Medellín (CO).
10. *Dynamics of superconducting qubits in open transmission lines*, APS March Meeting, 2014-03-03/07, Denver (USA).
11. *Multipulse Quantum Interferometry: algorithms for frequency comb stabilization and characterization*, QIPC, Florence 2013-06-30/07-05 (IT).
12. *Shaping an Itinerant Quantum Field into a Multimode Squeezed Vacuum by Dissipation*, J. J. Garcia-Ripoll & D. Porras, APS March Meeting 2012-02-27/03-02, Boston (USA).
13. *Strain and Dirac equations in optical lattices*, póster, Bose-Einstein Condensation 2011, 2011-11-23/25, Sant Feliu de Guixols (ES).
14. *Sidebands and squeezing in open transmission lines*, poster, SOLID Workshop, 2010-10-07/08, Munich (DE).
15. *Quantum Simulation*, Trobades Científiques de la Mediterranea, 2010-09-29 - 2010-10-02, Menorca (ES).
16. *From  $\mu$ -wave photodetection to switchable interactions in circuit QED*, International Conference on Quantum Optics, 2010-02-21/26, Obergurgl, Tirol, Austria.
17. *Microwave Photon Detection in circuit-QED*, poster, QIPC 2009 International Conference on Quantum Information Processing and Communication, 2009-09-21/25 Roma (IT).
18. *Pair condensation of bosonic ultracold atoms* poster, BEC 2009, 2009-09-5/11, San Feliu de Guixols (ES).
19. *Microwave Photon Detection in circuit-QED* poster International Workshop and School on Solid State Based Quantum Information Processing, 2009-06-01/03, Herrsching (DE).
20. *Microwave Photon Detection in circuit-QED* APS March Meeting 2009, Pittsburgh (USA).
21. *Pairing of cold atoms in optical superlattices* poster, Recent progress in the studies of quantum gases, 2007-06-27/30, Paris (FR).
22. *Feshbach ramping for cold atoms in optical lattices: an MPS study* poster, ICAP 2006, Innsbruck (AT).
23. *Feshbach ramping for cold atoms in optical lattices: an MPS study* J. J. García-Ripoll. Poster, CATCOM 2006, Dresden (DE).
24. *Frustrated models with cold atoms in optical lattices* DPG Tagungen, 2006-03-13/17, Frankfurt (DE).
25. *Frustration and cold atoms in Optical Lattices* poster, ESF Cold Atoms Conference, 2005-09-11/15, San Feliu (ES).
26. *Coherent control of trapped ions using off-resonant lasers* DPG Tagungen, 2005-03-04/08, Berlin (DE).



27. *Spin Hamiltonian simulation in optical lattices* International Laser Physics Workshop (LPHYS'04) I.C.T.P. Trieste (IT)
28. *Coherent control of trapped ions* Ringberg Workshop, Schloss Ringberg, 2003-06-05/07, Tegernsee (DE).
29. *Speed optimized 2-qubit gates with laser coherent control techniques* J. J. García-Ripoll, J. I. Cirac, P. Zoller. QUEST Conference, 2004-03-06/12 La Thuile (IT).
30. *Variational ansatz for the Superfluid/Mott-insulator phase transition in optical lattices* poster, BEC 2003, 2003-09-13/18, San Feliu de Gixols (ES).
31. *Variational ansatz for the Superfluid/Mott-insulator phase transition in optical lattices* poster, Theory of Quantum Gases and Quantum Coherence, 2003-06-11/14, Levico Terme (IT).
32. *Quantum computation with cold atoms in an optical lattice* D. P. G. Tagungen 2003-03-24/28, Hannover (Germany).
33. *Quantum computing with unknown parameters* Bose–Einstein Condensation and Quantum Information, 2003-02-16/20 Caloundra (Australia).
34. *Spin dynamics for bosons in an optical lattice* poster, 7th. International Workshop on atom optics and interferometry, 2002-09-28, Lunteren (The Netherlands).
35. *Spin dynamics for bosons in an optical lattice* poster, Recent developments in the physics of cold atomic gases, 2002-07-15/18, Trento (IT).
36. *Vórtices en CBE: doblado y otros fenómenos no lineales* Nolineal 2002, 2002-06-05/08, Cuenca (ES).
37. *Results about rotating BEC* poster, Euresco BEC 2001, San Feliú des Guixols (ES).
38. *Vortices in BEC: bending and hysteresis* poster, Theory of Quantum Gases and Quantum Coherence 2001, Salerno (IT).

## OTHER MERITS

1. Deep knowledge about operating systems (Unix, OS/2, MS-DOS), programming languages of imperative (C/C++, Pascal, Fortran) and functional types (Standard ML, Scheme). Notions of multithreaded programming and of distributed programming.
2. Developer of an implementation of ANSI Common–Lisp called ECL, a compiler and interpreter which produces standalone executables, libraries and allows deep integration of C/C++ (<http://ecls.sf.net>)

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