

# Alba Cervera-Lierta | Full CV

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## Education

<b>Doctor of Philosophy (PhD) in Physics</b> <i>Supervisor: Dr. José Ignacio Latorre</i> Title: Maximal Entanglement: Applications to Quantum Computation and Particle Physics.	<b>Universitat de Barcelona</b> 2015 – 2019
<b>Master in Astrophysics, Particle Physics and Cosmology</b> <i>Specialized in Particle Physics and Gravitation.</i> Thesis title: Non-unitary neutrino oscillations.	<b>Universitat de Barcelona</b> 2014 – 2015
<b>Bachelor in Physics</b> <i>Specialized in Fundamental Physics</i> Thesis title: Scaling of entanglement support for iTEBD algorithm.	<b>Universitat de Barcelona</b> 2009 – 2014

## Positions

<b>Research</b> .....	
<b>Senior Researcher</b> <i>Quantic group (CASE department), Ramón y Cajal fellow since 2024.</i>	<b>Barcelona Supercomputing Center</b> 2021 – Present
<b>Postdoctoral Fellow</b> <i>Alán Aspuru-Guzik group</i>	<b>University of Toronto</b> 2019 – 2021
<b>Technical Researcher</b> <i>Quantic group (CASE department)</i>	<b>Barcelona Supercomputing Center</b> 2017 – 2019
<b>Specialized Technician</b> <i>Project: "Entanglement, tensor networks and cold gases"</i>	<b>Universitat de Barcelona</b> 2014
<b>Coordinator</b> .....	
<b>EuroQCS-Spain project</b> <i>Quantum computing technology responsible (budget: 12,5 M €)</i>	<b>Barcelona Supercomputing Center</b> 2022 – Present
<b>Quantum Spain project</b> <i>Project Principal Investigator (budget: 22M €)</i>	<b>Barcelona Supercomputing Center</b> 2021 – Present
<b>Visitor</b> .....	
<b>Center of Quantum Technologies</b> <i>Prof. Kwek Leong Chuan group.</i>	<b>National University of Singapore</b> May 2017
<b>Instituto de Física Teórica</b> <i>Dr. César Gómez's group.</i>	<b>CSIC</b> Feb 2017
<b>Grupo de investigación en Información y Computación Cuántica</b> <i>Dr. Vicente Martín group</i>	<b>Universidad Politécnica de Madrid</b> Sep 2016
<b>Rudolph Pierls Institute for Theoretical Physics</b> <i>Dr. Juan Rojo's group.</i>	<b>University of Oxford</b> Jan - May 2016

## Funded projects

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### European

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**EuroQHPC-Integration project** **EuroHPC - Joint Undertaking**  
*Budget: 745.200 €(WP), Role: EuroQCS-Spain consortia coordinator.* 2025 – 2029

### National

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**Logic Artificial Intelligence for Photonics (LOGITONICS)** **Agencia Estatal de Investigación (AEI)**  
*Budget: 75k €, Role: principal investigator.* 2024 – 2028

**Ramón y Cajal fellowship** **Agencia Estatal de Investigación (AEI)**  
*Budget: 50k €, Tenure track position.* 2024 – 2029

**Quantum Spain project** **Secretary of State of Digitalization and AI (SEDIA)**  
*Budget: 22M €, Role: principal investigator* 2021 – 2025  
<https://quantumspain-project.es>

### Industry

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**Quantum Experience for Academic Research Program** **IBM**  
*Funding: Exclusive access to pulse-level control of IBM quantum devices, Role: co-PI.* 2021 – 2022  
Project: High-dimensional quantum experiments superconducting circuits.

## Awards and Honors

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**DTIC - Ingenierías UPF research award for women researchers** **Universitat Pompeu Fabra**  
May 2024

**PhD Excellent Cum Laude** **Universitat de Barcelona**  
Jun 2019

**Teach Me QISKit Award** **IBM**  
Jun 2018

## Publications

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Link to [Google Scholar](#) and [Orcid](#).

**20. Distributed Quantum Circuit Cutting for Hybrid Quantum-Classical HPC** **Preprint**  
*M. Tejedor, B. Casas, F. Conejero, A. Cervera-Liarta, R. Badia* 2025  
arXiv:2505.01184v1 [cs.DC].

**19. Universality of entanglement in gluon dynamics** **Preprint**  
*C. Núñez, A. Cervera-Liarta, J. I. Latorre* 2025  
arXiv:2504.15353v1 [hep-th].

**18. Quantum Circuits for High-Dimensional Absolutely Maximally Entangled States** **Preprint**  
*B. Casas, G. Rajchel-Mieldzioć, S. Ahmad Rather, M. Płodzień, W. Bruzda,* 2025  
*A. Cervera-Liarta, K. Życzkowski,* arXiv:2504.05394 [quant-ph].

**17. Multidimensional Fourier series with quantum circuits** **Phys. Rev. A**  
*B. Casas, A. Cervera-Liarta* 2023  
Physical Review A 107, 062612 (2023).

**16. Design of quantum optical experiments with Logic Artificial Intelligence** **Quantum**  
*A. Cervera-Liarta, M. Krenn, A. Aspuru-Guzik* 2022  
Quantum 6, 836 (2022).

**15. On scientific understanding with artificial intelligence** **Nat. Rev. Phys.**  
*M. Krenn, R. Pollice, S. Y. Guo, et. al.* 2022  
Nature Review Physics (2022).

14. **Toward Reliability in the NISQ Era: Robust Interval Guarantee for Quantum Measurements on Approximate States** Phys. Rev. Research  
2022  
*M. Weber, A. Anand, A. Cervera-Liarta, J. S. Kottmann, T. H. Kyaw, et. al.*  
Physical Review Research **4**, 033217 (2022).
  13. **Programming Physical Quantum Systems with Pulse-Level Control** Front. Phys.  
2022  
*K. N. Smith, G. S. Ravi, T. Alexander, et. al.*  
Frontiers in Physics, **672** (2022).
  12. **Learning Interpretable Representations of Entanglement in Quantum Optics Experiments using Deep Generative Models** Nat. Mach. Intell.  
2021  
*D. Flam-Shepherd, T. Wu, X. Gu, A. Cervera-Liarta, M. Krenn, A. Aspuru-Guzik*  
Nature Machine Intelligence **4** (6), 544-554 (2022).
  11. **Experimental high-dimensional Greenberger–Horne–Zeilinger entanglement with superconducting transmon qutrits** Phys. Rev. Appl.  
2022  
*A. Cervera-Liarta, M. Krenn, A. Aspuru-Guzik, A. Galda*  
Physical Review Applied **17**, 024062 (2022).
  10. **Noisy intermediate-scale quantum algorithms** Rev. Mod. Phys.  
2022  
*K. Bharti, A. Cervera-Liarta, T. H. Kyaw, T. Haug, et. al.*  
Review of Modern Physics **94**, 015004 (2022).
  9. **The Meta-Variational Quantum Eigensolver (Meta-VQE): Learning energy profiles of parameterized Hamiltonians for quantum simulation** PRX Quantum  
2021  
*A. Cervera-Liarta, J. S. Kottmann and A. Aspuru-Guzik*  
PRX Quantum **2**, 020329 (2021).
  8. **Tequila: A platform for rapid development of quantum algorithms** Quantum Sci. Technol.  
2021  
*J. S. Kottmann, S. Alperin-Lea, T. Tamayo-Mendoza, A. Cervera-Liarta et. al.*  
Quantum Science and Technology **6** 024009 (2021).
  7. **Data Re-uploading for a Universal Quantum Classifier** Quantum  
2020  
*A. Pérez-Salinas, A. Cervera-Liarta, E. Gil-Fuster, J. I. Latorre*  
Quantum **4**, 226 (2020).
  6. **Maximal Entanglement: Applications in Quantum Information and Particle Physics** PhD Thesis  
2019  
*A. Cervera-Liarta*  
arXiv:1906.12099 [quant-ph].
  5. **Quantum Circuits for Maximally Entangled States** Phys. Rev. A  
2019  
*A. Cervera-Liarta, J. I. Latorre, D. Goyeneche*  
Physical Review A **100**, 022342 (2019).
  4. **Exact Ising Simulation on a Quantum Computer** Quantum  
2018  
*A. Cervera-Liarta*  
Quantum **2**, 114 (2018).
  3. **Multipartite Entanglement in Spin Chains and the Hyperdeterminant** J. Phys. A Math. Theor.  
2018  
*A. Cervera-Liarta, A. Gasull, J. I. Latorre and G. Sierra.*  
Journal of Physics A: Mathematical and Theoretical **51**, 505301 (2018).
  2. **Maximal Entanglement in High Energy Physics** SciPost Phys.  
2017  
*A. Cervera-Liarta, J. I. Latorre, J. Rojo and L. Rottoli*  
SciPost Physics **3**, 036 (2017).
  1. **Operational Approach to Bell Inequalities: Application to qutrits** Phys. Rev. A  
2016  
*D. Alsina, A. Cervera, D. Goyeneche, J. I. Latorre and K. Zyczkowski*  
Physical Review A **94**, 032102 (2016).
- Reports and white papers**.....
- When matter and information merge into “Quantum”** Commun. Phys.  
2023  
*R. Aguado, A. Cervera-Liarta, A. Correia, et. al., Communications Physics 6(1) 266 (2023).*
- Workflows Community Summit 2022: A Roadmap Revolution** Technical Report  
2023  
*R. Ferreira da Silva, R. M. Badia, V. Bala, et. al.*  
ORNL/TM-2023/2885, arXiv:2304.00019 [cs.DC].

## Books, chapters and notes.....

<b>Machine learning in quantum sciences</b> <i>A. Dawid, J. Arnold, B. Requena, et. al.</i> Cambridge University Press 2025, arXiv:2204.04198 [quant-ph].	<b>Cambridge University Press</b> 2025
<b>Simulation of the 1d XY model on a quantum computer</b> <i>M. Farreras, A. Cervera-Lierta</i> arXiv:2410.21143 [quant-ph].	<b>Preprint</b> 2024

## Software development.....

### Libraries:

<b>Distributed quantum circuit cutting library "Qdislib"</b> <i>Project collaborator, <a href="https://qdislib.readthedocs.io/">https://qdislib.readthedocs.io/</a></i>	<b>Python</b> 2025
<b>Quantum computing open-source library "Tequila"</b> <i>Project collaborator, <a href="https://github.com/tequilahub/">https://github.com/tequilahub/</a></i>	<b>Python</b> 2021
<u>Codes and demos:</u>	
<b>Logic AI algorithm "Klaus"</b> <i>Creator and developer, <a href="https://github.com/AlbaCL/Klaus">https://github.com/AlbaCL/Klaus</a></i>	<b>Mathematica</b> 2022
<b>Meta Variational Quantum Eigensolver</b> <i>Co-creator and developer., <a href="https://github.com/aspuru-guzik-group/Meta-VQE">https://github.com/aspuru-guzik-group/Meta-VQE</a></i>	<b>Python</b> 2021

## Talks and seminars.....

Some of my talks' videos are listed in my [Youtube Channel playlists](#).  
Virtual talks due to COVID-19 pandemic.

### Keynote.....

<b>Lliçó Innaugural</b> <i>"Tecnologies quàntiques: passat, present i futur d'una (r)evolució tecnològica"</i> Enginyeries Universitat Pompeu Fabra.	<b>UPF</b> Sep 30 2024
<b>100tífiques</b> <i>"Tecnologies quàntiques: passat, present i futur d'una (r)evolució tecnològica"</i> Fundació Catalana per a la Recerca i la Innovació.	<b>UPC</b> Feb 1 2024
<b>The quest for the quantum computer</b> <i>Barcelona, Spain</i>	<b>10<sup>th</sup> BSC Doctoral Symposium</b> May 9, 2023
<b>The Noisy Intermediate-Scale Quantum era</b> <i>Porto Alegre, Brasil</i>	<b>CARLA 2022</b> Sep 28-30, 2022
<b>Margarita Salas Honoris Causa PhD act</b> <i>"De las computadoras a los ordenadores"</i>	<b>Universidad de Extremadura</b> Feb 2 2019

### Colloquium.....

<b>Computación cuántica: pasado, presente y futuro de una revolución tecnológica</b> Opening academic year Aula de Ciencia y Tecnología, Universidad de Alicante, Spain.	<b>Universidad de Alicante</b> Sep 28, 2023
<b>Tecnologies quàntiques: present i futur</b> <i>Universitat de Barcelona, Spain.</i>	<b>ICCUB Colloquia</b> Feb 16, 2022

### Invited.....

<b>Quantum computers: the new supercomputer partition</b> <i>HiPEAC 2025, Classical HPC &amp; QC: the way to foster the integration workshop</i>	<b>Barcelona, Spain.</b> Jan 20, 2025
<b>Quantum computers: the new supercomputer partition</b> <i>SC24</i>	<b>Atlanta, USA</b> Nov 20, 2024

<b>Design of quantum optical experiments with logic artificial intelligence</b> <i>SCOP24</i>	<b>ICFO, Barcelona</b> <i>Oct 3, 2024</i>
<b>Building the Spanish Quantum Computer</b> <i>Quantum Technologies in Europe, Madrid, Spain</i>	<b>Quanteria</b> <i>Nov 23, 2023</i>
<b>Quantum-HPC integration: challenges and opportunities</b> <i>EQTC 2023</i>	<b>Hannover, Germany</b> <i>Oct 19, 2023</i>
<b>Variational Quantum Algorithms</b> <i>QTYR 2023</i>	<b>CSIC, Madrid</b> <i>Jul 04, 2023</i>
<b>Quantum Spain in the NISQ era</b> <i>QBN Meeting on Quantum Computing and Applications</i>	<b>BSC-CNS</b> <i>Jun 15, 2023</i>
<b>High-dimensional quantum computation: opportunities and challenges</b> <i>Symposium on Open-Source Tools for Quantum Computing &amp; Simulation</i>	<b>ICFO</b> <i>Mar 31, 2023</i>
<b>High-dimensional quantum computation</b> <i>CERN</i>	<b>QT4HPC</b> <i>Nov 2, 2022</i>
<b>Quantum algorithms in near term devices</b> <i>IQTC, University of Barcelona (Spain).</i>	<b>New Trends in Computational Chemistry</b> <i>Sep 9, 2022</i>
<b>Quantum Spain</b> <i>Barcelona (Spain).</i>	<b>Quantum 2022</b> <i>Jun 22, 2022</i>
<b>Quantum Spain: un impulso para el ecosistema de computación cuántica</b> <i>NASERTIC, Pamplona (Spain).</i>	<b>Jornada cuántica</b> <i>May 4, 2022</i>
<b>Quantum Spain: un impulso para el ecosistema de computación cuántica</b> <i>SCAYLE, León (Spain).</i>	<b>Jornada Eco. Cuántico</b> <i>Mar 1, 2022</i>
<b>Near term quantum computation: opportunities and challenges</b> <i>Bilbao (Spain).</i>	<b>Quantum 2021</b> <i>Nov 24, 2021</i>
<b>Noisy Intermediate-Scale Quantum era</b> <i>Virtual (*).</i>	<b>JURES 2021</b> <i>Sep 17, 2021</i>
<b>Noisy Intermediate-Scale Quantum algorithms</b> <i>Perspectives on Quantum Sensing and Computation for Particle Physics. Virtual (*).</i>	<b>CERN</b> <i>Jul 15, 2021</i>
<b>The Meta-Variational Quantum Eigensolver</b> <i>Virtual (*).</i>	<b>Machine Learning for Quantum X</b> <i>Jul 6, 2021</i>
<b>The Meta-Variational Quantum Eigensolver</b> <i>Virtual (*).</i>	<b>QWorld Quantum Science Days</b> <i>Jun 1, 2021</i>
<b>Chronicles of Entangland, the foundation of the SC town</b> <i>Virtual (*).</i>	<b>Qiskit Hackathon Europe</b> <i>May 26, 2021</i>
<b>Experimental high-dimensional GHZ entanglement with superconducting transmon qutrits</b> <i>Chicago. Virtual (*).</i>	<b>Pulse-level Quantum Control Workshop</b> <i>May 18, 2021</i>
<b>Maximal Entanglement in High Energy Physics</b> <i>Topical Group on Hadronic Physics. Virtual (*).</i>	<b>APS April Meeting</b> <i>Apr 15, 2021</i>
<b>Noisy Intermediate-Scale Quantum algorithms</b> <i>Virtual (*).</i>	<b>Universidad Iberoamericana</b> <i>Apr 13, 2021</i>
<b>Please, feed the quantum troll!</b> <i>Virtual (*).</i>	<b>Q-Hack 2021</b> <i>Feb 19, 2021</i>
<b>Testing and designing quantum algorithms for the NISQ era</b> <i>Quantum Computing and Simulation on Near-Term Devices. Virtual (*).</i>	<b>INT-20-3</b> <i>Nov 21, 2020</i>
<b>Maximal Entanglement in High Energy Physics, Quantum Entanglement at Collider Energies</b>	<b>CFNS Stony Brook</b> <i>Sep 11, 2018</i>

*Stony Brook (United States).*

**Exact simulation of a Quantum Phase Transition  
on a quantum computer**  
*Barcelona (Spain).*

**Quantum Phase Transitions**  
*Apr 05, 2018*

**Emergence of Gauge Symmetry  
from a Maximal Entanglement Principle**  
*Madrid (Spain).*

**Universidad Complutense de Madrid**  
*Sep 21, 2016*

## Contributed

**The Meta-Variational Quantum Eigensolver**  
*Virtual (\*).*

**APS March Meeting 2021**  
*Mar 18, 2021*

**Data re-uploading for a universal quantum classifier**  
*Virtual (\*).*

**Q-Turn 2020**  
*Nov 24, 2020*

**Data re-uploading for a universal quantum classifier**  
*Quantum Techniques Machine Learning. Virtual (\*).*

**QTML 2020**  
*Nov 12, 2020*

**Maximal Entanglement in Quantum Computation**  
*Barcelona (Spain).*

**BSC Severo Ochoa Doctoral Symposium**  
*May 07, 2019*

## Seminars

**Computació quàntica: reptes i oportunitats**  
*FIB*

**UPC**  
*Mar 11, 2025*

**The Noisy Intermediate-Scale Quantum Computation**  
*IQCC*

**Universitat de Girona**  
*Jan 21, 2025*

**Computación cuántica: pasado, presente y futuro de una revolución tecnológica**  
*Madrid, Spain*

**Telefónica**  
*Feb 21, 2024*

**Quantum-HPC integration: challenges and opportunities**  
*Toronto, Canada*

**LG Toronto**  
*Oct 26, 2023*

**Quantum Spain: creating a public quantum-HPC infrastructure**  
*European Commission (Virtual).*

**Quantum Cafe**  
*Sep 21, 2023*

**A roadmap to quantum computing integration into HPC infrastructures**

**RISC2 Seminar Series**  
*Mar 15, 2023*

**Noisy Intermediate Scale Quantum Computation**  
*Dept. Condensed Matter Physics.*

**Universidad de Zaragoza**  
*Jun 3, 2022*

**Noisy Intermediate Scale Quantum Computation**  
*Virtual.*

**Universidad Nacional de Colombia**  
*Apr 21, 2022*

**Design of quantum optical experiments with logic artificial intelligence**  
*Quantum Optics group seminar.*

**MPQ**  
*Oct 29, 2021*

**High-dimensional quantum computing experiments**  
*Prof. Manas Mukherjee group meeting (Singapore, Virtual \*)*

**CQT**  
*Aug 03, 2021*

**Maximal Entanglement in a Quantum Computer**  
*Fermilab theory seminars. Virtual (\*)*

**Fermilab**  
*Jun 15, 2021*

**The Meta-Variational Quantum Eigensolver**  
*Oxford Quantum Information Society. Virtual (\*)*

**Oxford**  
*May 20, 2021*

**The Meta-Variational Quantum Eigensolver**  
*Virtual.*

**Scientific Machine Learning Webinars**  
*May 6, 2021*

**Noisy Intermediate-Scale Quantum algorithms**  
*Hypatia Series. Virtual(\*).*

**Alexandria University**  
*Apr 8, 2021*

**Maximal Entanglement in High Energy Physics**  
*Nuclear Theory series. Virtual(\*).*

**University of Maryland**  
*Apr 2, 2021*

<b>Noisy Intermediate-Scale Quantum algorithms</b> <i>Belgian Quantum Physics Initiative. Virtual(*).</i>	<b>Académie Royale de Belgique</b> <i>Mar 4, 2021</i>
<b>Designing VQA with Tequila</b> <i>Virtual.</i>	<b>Quantum Conversations by the Bay</b> <i>Nov 28, 2020</i>
<b>Maximal Entanglement. Applications to Quantum Computation and Particle Physics</b> <i>Matterlab group meeting. Toronto (Canada).</i>	<b>UofT</b> <i>Mar 1, 2029</i>

## Panels and round tables

### As a moderator

<b>Round table Industrial forum</b> <i>Participants: Marta Estarellas, Richard Kienhoefer, Pascale Senellart, Fernando de la Iglesia and Bilal Kalyoncu</i>	<b>Quantum Matter 2023</b> <i>May 24, 2023</i>
<b>Round table Industrial forum</b> <i>Participants: Marc Almendros, Niels Bultink, Gianni del Bimbo, Daniel Szombati, Yonatan Cohen, Josep M. Martorell, Heike Riel and Carmen Palacios.</i>	<b>Quantum Matter 2022</b> <i>Jun 22, 2022</i>

### As a participant

<b>Quantum computing + Communications: meet at the halfway.</b> <i>Pannel with Hugues de Riedmatten.</i> Moderated by Carmen G. Almudéver.	<b>PuzzleX</b> <i>Oct 7, 2022</i>
<b>Catalan Nanotech Ecosystem Session</b> <i>Moderated by Stephan Roche.</i>	<b>ACM Nanocomm</b> <i>Oct 7, 2022</i>
<b>Women in ACM/IEEE WICE Luncheon</b> <i>Moderated by Núria Castell.</i>	<b>ACM Nanocomm</b> <i>Oct 6, 2022</i>
<b>Quantum Computing: Changing the Course of Industry</b> <i>Round table with Carlos Kuchkovsky, Marta Pita, and Enrique Sanchez.</i> Moderated by Jaime Gómez.	<b>Barcelona New Economy Week</b> <i>Oct 3, 2022</i>
<b>Quantum Technologies</b> <i>Panel with Silvia Carrasco, Carlos Abellán and Enrique Mora.</i> Moderated by Rubén Criado	<b>Barcelona Deep Tech Summit</b> <i>Sep 22, 2022</i>
<b>The Impact of Advanced Computing in AI</b> <i>Round table with Jean Pierre Panziera and Nicolas Moes.</i> Moderated by David Pringle	<b>Science Business</b> <i>Sep 19 2022</i>
<b>The Future of HPC</b> <i>Panel with Paul Messina, Per Stenström, Uri Weiser and Min Li.</i> Moderated by Josephine Wood	<b>ACM Europe Summer School</b> <i>Sep 2 2022</i>
<b>Young People Program Career Panel</b>	<b>DATE 2022</b> <i>Mar 21 2022</i>
<b>Quantum Software Ecosystem</b> <i>Pannel discussion with industry and academic members</i>	<b>IEEE Services</b> <i>Sep 9 2021</i>

## Committees

### National

<b>Vice-president</b> <i>Grupo Especializado en Información y Tecnologías Cuánticas (GEITC).</i>	<b>Real Sociedad Española de Física</b> <i>2023 - Present</i>
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### European

<b>Quantum Computing working group</b> <i>Quantum Coordination Board</i>	<b>European Quantum Flagship and EuroHPC</b> <i>2023 - Present</i>
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**Quantum Standarization working group**

*Quantum Coordination Board*

**Quantum - HPC Working group**

**European Quantum Flagship and EuroHPC**

*2023 - Present*

**European Quantum Flagship**

*2022 - Present*

## Scientific Advisory Board.....

**Finish Quantum Initiative**

**CSC, Aalto University, VTT**

*2023 - Present*

**Consell de les Tecnologies Quàntiques de Catalunya**

*Board member*

**Generalitat de Catalunya**

*2022 – 2024*

## Scientific Committee.....

Quantum Techniques in Machine Learning 2023, CERN.

ICE8 2023, Santiago de Compostela.

Quantum Matter 2023, Madrid.

Quantum Matter 2022, Barcelona.

Quantum Techniques in Machine Learning 2020, Virtual.

## PhD Thesis committees.....

**Memory Management in Software Quantum Computing Simulators**

*Gilberto Díaz*

Supervisors: C. Jaime Barrios Hernández, L. Angelo Steffenel, J. F. Couturier

**U. Industrial de Santander**

*Dec 9, 2024*

**Quantum many-body ground states via digital quantum simulation**

*Bruno Rodrigues Pacheco e Murta*

Supervisors: Joaquín Fernández-Rossier, Nuno Miguel Machado Reis Peres

**Universidade do Minho**

*Feb 29, 2024*

**Reservoir Computing in Quantum Systems**

*Rodrigo Martínez Peña*

Supervisor: Roberta Zambrini, Miguel Cornelles Soriano

**Universitat de les Illes Balears**

*Sep 7, 2023*

**Fault tolerant quantum algorithms**

*Pablo Moreno-Casares*

Supervisor: Miguel Ángel Martín-Delgado

**Universidad Complutense de Madrid**

*Jan 17, 2023*

**Quantum information in lattices**

*Bruna Gabrielly De Moraes Araújo*

Supervisors: Antonio Acín dal Maschio, Daniel Cavalcanti Santos and Stephan Jean Louis Roche

**Universitat Autònoma de Barcelona**

*Jul 22, 2022*

## Conference and seminars organization

**Spring School on Near-Term Quantum Computing**

*Co-organizer. Centro de Ciencias de Benasque Pedro Pascual.*

**Benasque, Spain.**

*Apr 14-27, 2024*

**Quantum Matter International Conference**

*Industrial forum co-organizer.*

**Madrid**

*May 22-25, 2023*

**Quantum Research Seminars Toronto.**

*Co-organizer and chair. Youtube: Quantum Research Seminars Toronto.*

**Virtual**

*2020 – 2021*

## Teaching

### Lectures and courses.....

**A gentle introduction to quantum computing**

*ACM Europe Summer School on HPC*

*The quest for the quantum computer*

**A gentle introduction to quantum computing**

*ACM Europe Summer School on HPC*

**ACM Europe, Barcelona**

*July 7, 2023*

**ACM Europe, Barcelona**

*July 7, 2023*



<b>Quantum Algorithms I and II</b> <i>Spring School on Superconducting Qubit Technology</i>	<b>Centro de Ciencias de Benasque Pedro Pascual</b> <i>Apr 11-21, 2023</i>
<b>The Noisy Intermediate Scale Quantum Computation</b> <i>Escenarios Científicos</i>	<b>Universidad Complutense de Madrid</b> <i>Mar 14, 2023</i>
<b>The Noisy Intermediate Scale Quantum Computation</b> <i>Master Modelling for Science and Engineering Research and Innovation</i>	<b>Universitat Autònoma de Barcelona</b> <i>Oct 4, 2022</i>
<b>Variational Quantum Computing</b> <i>IV Summer School on Quantum Computing</i>	<b>Universidad Internacional Menéndez-Pelayo</b> <i>Sep 5-9, 2022</i>
<b>Near-term quantum computing</b> <i>Clase introducción al curso en Quantum Computing software.</i>	<b>Universidad Castilla La-Mancha</b> <i>Jun 20, 2022</i>
<b>NISQ computing</b> <i>Theory lectures</i>	<b>Institut de Ciències Fotòniques (ICFO)</b> <i>Mar 15-24, 2022</i>
<b>Variational Quantum Computing</b> <i>III Summer School on Quantum and Q-Inspired Computing</i>	<b>Universidad Internacional Menéndez-Pelayo</b> <i>Sep 7, 2021</i>
<b>Noisy Intermediate-Scale Quantum Algorithms</b> <i>Summer School "Machine Learning in Quantum Physics and Chemistry"</i>	<b>Warsaw, Poland</b> <i>Aug 25, 2021</i>
<b>Quantum Computing in the NISQ era</b> <i>Talk in Quantum Technologies Winter School</i>	<b>UCL</b> <i>Dec 10, 2020</i>
<b>Bojos per la Supercomputació</b> <i>Introductory course in quantum computation for high-school students</i>	<b>BSC</b> <i>26 Apr – 04 May, 2019</i>
<b>The Quantum Revolution</b> <i>Seminar at Master in Finance</i>	<b>ESADE Business School</b> <i>Jun 07, 2018</i>

## Teaching positions

<b>Teacher Assistant</b> <i>Calculus I-II, Theoretical Mechanics, Physics I - II.</i>	<b>Universitat Autònoma de Barcelona</b> <i>2017 – 2019</i>
<b>Teacher Assistant</b> <i>Modern Physics Laboratory, Computational Physics.</i>	<b>Universitat de Barcelona</b> <i>2016 – 2017</i>

## Students

### PhD

<b>Francesco Aldo Venturelli</b> <i>Co-supervised with Miguel Ángel González Ballester</i>	<b>Universitat Pompeu Fabra</b> <i>Nov 2024 – Present</i>
<b>Berta Casas Font</b> <i>Co-supervised with Artur Garcia</i>	<b>University of Barcelona</b> <i>Sep 2022 – Present</i>

### Master

<b>Juan Francisco Martín Bravo</b> <i>Quantum benchmarking: entanglement measures in a quantum computer</i> Master Quantum Science and Technology.	<b>University of Barcelona</b> <i>Feb 2023 – Jul 2023</i>
<b>Berta Casas Font</b> <i>Quantum function fitting and classification beyond the single-qubit model</i> Master Quantum Science and Technology.	<b>University of Barcelona</b> <i>Feb 2022 – Jul 2022</i>

### Internships

<b>Francesc Sabater Garcia</b> <i>Adding Qibo as a Supported Framework for Mitiq</i> Master Quantum Science and Technology.	<b>University of Barcelona</b> <i>Sep 2023 – Feb 2024</i>
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## Undergraduate (degree)

**Marc Farreras**

*Exact XY model simulation with a quantum computer*

Physics Degree

**University of Barcelona**

*Feb 2023 – Jul 2023*

**Alex Alemany**

*The HHL algorithm*

Computer Science Degree. Co-supervised with Jordi Delgado.

**Universitat Politècnica de Catalunya**

*Feb 2023 – Jul 2023*

**Júlia Barberà Rodríguez**

*Application of Grover's quantum algorithm for string matching*

Physics Degree

**University of Barcelona**

*Feb 2022 – Jul 2022*

**Elies M. Gil Fuster**

*Variational Quantum Classifier*

Physics Degree. Co-supervised with J. I. Latorre.

**University of Barcelona**

*Feb 2019 – Jul 2019*

## Outreach

Some of my talks and events videos are listed in my [Youtube Channel](#) playlists.

## Articles

**Supercomputación y computación cuántica:  
el camino hacia la integración**

*Revista Española de Física 38 (2), 37-41*

**Revista Española de Física**

*Mar 2024*

**L'ordinador quàntic: un camí de ciència, tecnologia i sobirania**

*Revista IDEES núm. 61 "Quantum: una revolució que canviarà el món?"*

Translated to Spanish, English and Catalan.

**Revista IDEES**

*Feb 2024*

**Computación Cuántica en la Nube**

*Revista Española de Física 34 (1), 25-29.*

**Revista Española de Física**

*Mar 2020*

**How I became a quantum computation scientist**

*Medium article for @qiskit*

*Jul 2018*

**Contributing Writer**

*Medium articles, @quantum\_wa.*

**Quantum World Association**

*2018 – 2019*

## Commissary

**City and Science Biennial**

*With Toni Pou and Teresa Badia.*

**Ajuntament de Barcelona**

*2025*

## Panels and round tables

**Talent Arena MWC**

*Conversation with Antonio Acín*

**Barcelona**

*Mar 5, 2025*

**Jornades REACT**

*Round table with Teresa Riesgo Alcaide, Laia Bonet, Xavier Azemar Mallard Mateo Valero Cortes.*

*Moderated by Elena Arrieta Palacio.*

**Barcelona**

*Mar 29, 2023*

**Premios Nacionales de Investigación**

*Presenter and moderator of the act.*

*Chaired by HRH King and Queen of Spain, Spanish Minister of Science and Universities and Barcelona Mayor.*

**Barcelona**

*May 5, 2022*

**Mujeres y Digitalización: Por una España Igualitaria**

*Round table with Marta Villegas, Lucía Flecha and Susana Fernández.*

*Moderated by the Secretary of State of Digitalization and AI Carme Artigas.*

**MINECO**

*Mar 8, 2022*

**Dia Internacional Dona i Nena a la ciència**

*Event with Barcelona city Mayor and government.*

**Ajuntament de Barcelona**

*Feb 11, 2022*

**Women in Physics path**

*Organized by the Equality commission from the Physics Faculty*

**Universitat de Barcelona**

*Mar 3 2021*

## Keynote speech.....

<b>Bojos de la Ciència</b> <i>Speech about Bojos per la Supercomputació program</i>	<b>Fundació Catalunya-La Pedrera</b> Dec 10 2018
<b>Bojos de la Ciència</b> <i>Speech at Master grants act</i>	<b>Fundació Catalunya-La Pedrera</b> Oct 16 2018

## Talks and courses.....

<b>Computació quàntica: passat, present i futur d'una (r)evolució tecnològica</b> <i>Mobile World Congress</i>	<b>Beat Barcelona</b> Mar 6, 2025
<b>Quantum computers: the new supercomputer partition</b> <i>Mobile World Congress</i>	<b>BSC Booth.</b> Mar 6, 2025
<b>Computación cuántica: pasado, presente y futuro de una (r)evolución tecnológica</b> <i>Casa del Cordón</i>	<b>Burgos, Spain.</b> Feb 27, 2025
<b>Computació quàntica: passat, present i futur d'una (r)evolució tecnològica</b> <i>Cicle Últimes fronteres: la ciència del segle XXI</i>	<b>Universitat de Girona</b> May 4, 2023
<b>Computación cuántica: presente y futuro de una revolución tecn.</b> <i>Jornada tecnológica.</i>	<b>Uni. Las Palmas de Gran Canaria</b> Apr 18, 2023
<b>Computació Quàntica i els reptes de Talent TIC en els propers anys</b> <i>Col·legi d'Informàtica de Catalunya</i>	<b>Lul·liana</b> Nov 24, 2022
<b>Tecnologies quàntiques: present i futur d'una (r)evolució tecnològica</b> <i>Casal de Joves Sant Just Desvern</i>	<b>Jornades Feministes</b> Nov 20, 2022
<b>Present i futur de les tecnologies quàntiques</b> <i>Two-day introductory course for senior citizens.</i>	<b>A-12 Estudis i Recerca Universitaria</b> Oct 20-26, 2022
<b>Computació quàntica: present i futur d'una revolució tecnològica</b> <i>Universitat Politècnica de Catalunya.</i>	<b>Open Day TIC</b> May 12, 2022
<b>Tecnologías Cuánticas: presente y futuro</b> <i>Barcelona.</i>	<b>Pint of Science</b> May 11, 2022
<b>Quantum Spain: un impulso para el ecosistema de computación cuántica</b> <i>Seminar for the Corporación Tecnológica de Andalucía. Virtual.</i>	<b>CTA</b> Apr 26, 2022
<b>Supercomputación y Quantum Spain</b> <i>Seminar for the Plataforma Tecnológica Española y de Tecnologías Disruptivas. Virtual.</i>	<b>PTE Disruptive</b> Mar 22, 2022
<b>Tecnologías cuánticas: presente y futuro</b> <i>Virtual.</i>	<b>Col·legi de Biòlegs de Catalunya</b> Mar 16, 2022
<b>Computación Cuántica</b> <i>Cosmocaixa (Barcelona)</i>	<b>Live Talks Cosmocaixa</b> Feb 16, 2022
<b>Quantum Spain</b> <i>Quantum Barcelona and Madrid meet-up.</i>	<b>Meet-up</b> Dec 13, 2021/Feb 9, 2022
<b>Quantum Calling</b> <i>Waterloo Quantum Meet-up</i>	<b>K-W Quantum Enthusiasts Meetup</b> Jun 18, 2020
<b>Quantica</b> <i>Quantum computing talk and participation in the exhibition (video)</i>	<b>CCCCB</b> Apr 10-Sep 26, 2019
<b>De las computadoras a los ordenadores</b> <i>Badajoz, Spain</i>	<b>Margarita Salas Honoris Causa PhD event</b> Feb 26, 2019
<b>Technology to manipulate Nature</b> <i>Madrid, Spain</i>	<b>El País con tu Futuro</b> Dec 18, 2018
<b>Quantum Computation: a new paradigm</b> <i>Sant Feliu de Llobregat, Barcelona, Spain</i>	<b>TEDx talk</b> Sep 15, 2018

**Quantum Computation**  
*Researcher's Night 2018*

**Cosmocaixa (Science Museum)**  
*Sep 28, 2018*

**Mentorship programs**.....

**Quantum Open Source Foundation mentorship program**  
*Mentor*

**QOSF**  
*Sep 2020 – Jan 2021*

**Girls E-Mentorship program**  
*Mentor*

**GEM**  
*Sep 2020 – June 2021*