

Alba Cervera-Lierta | CV

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Education

Doctor of Philosophy (PhD) <i>Supervisor: Dr. José Ignacio Latorre</i>	Universitat de Barcelona 2015 – 2019
Master in Astrophysics, Particle Physics and Cosmology <i>Specialized in Particle Physics and Gravitation.</i>	Universitat de Barcelona 2014 – 2015
Bachelor in Physics <i>Specialized in Fundamental Physics</i>	Universitat de Barcelona 2009 – 2014

Experience and Collaborations

Research

Senior Researcher <i>Quantic group (CASE department)</i>	Barcelona Supercomputing Center 2021 – Present
Postdoctoral Fellow <i>Alán Aspuru-Guzik group</i>	University of Toronto 2019 – 2021
Technical Researcher <i>Quantic group (CASE department)</i>	Barcelona Supercomputing Center 2017 – 2019
Specialized Technician <i>Project: "Entanglement, tensor networks and cold gases"</i>	Universitat de Barcelona 2014

Coordinator

Quantum Spain project <i>Project Coordinator</i>	Red Española de Supercomputación 2021 – Present
Quantum Research Seminars Toronto. <i>Co-organizer and chair. Youtube: Quantum Research Seminars Toronto.</i>	Virtual 2020 – 2021

Visitor

Center of Quantum Technologies <i>Prof. Kwek Leong Chuan group.</i>	National University of Singapore May 2017
Instituto de Física Teórica <i>Dr. César Gómez's group.</i>	CSIC Feb 2017
Grupo de investigación en Información y Computación Cuántica <i>Dr. Vicente Martín group</i>	Universidad Politécnica de Madrid Sep 2016
Rudolph Piers Institute for Theoretical Physics <i>Dr. Juan Rojo's group.</i>	University of Oxford Jan - May 2016

Teaching

Teacher Assistant	Universitat Autònoma de Barcelona 2017 – 2019
Teacher Assistant	Universitat de Barcelona 2016 – 2017

Awards and Honors

IBM Pulse Access Award	IBM Feb 2021
PhD Excellent Cum Laude	Universitat de Barcelona Jun 2019

Publications

- Toward Reliability in the NISQ Era: Robust Interval Guarantee for Quantum Measurements on Approximate States** Preprint
2021
M. Weber, A. Anand, A. Cervera-Liarta, J. S. Kottmann, T. H. Kyaw, B. Li, A. Aspuru-Guzik, C. Zhang, Z. Zhao
arXiv:2110.09793 [quant-ph].
- Design of quantum optical experiments with Logic Artificial Intelligence** Preprint
2021
A. Cervera-Liarta, M. Krenn, A. Aspuru-Guzik
arXiv:2109.13273 [quant-ph].
- Learning Interpretable Representations of Entanglement in Quantum Optics Experiments using Deep Generative Models** Preprint
2021
D. Flam-Shepherd, T. Wu, X. Gu, A. Cervera-Liarta, M. Krenn, A. Aspuru-Guzik
arXiv:2109.02490 [cs.LG].
- Experimental high-dimensional Greenberger–Horne–Zeilinger entanglement with superconducting transmon qutrits** Preprint
2021
A. Cervera-Liarta, M. Krenn, A. Aspuru-Guzik, A. Galda
arXiv:2104.05627 [quant-ph].
- Noisy intermediate-scale quantum (NISQ) algorithms** Review
2021
K. Bharti, A. Cervera-Liarta, T. H. Kyaw, T. Haug, et. al.
arXiv:2101.08448 [quant-ph]
- The Meta-Variational Quantum Eigensolver (Meta-VQE): Learning energy profiles of parameterized Hamiltonians for quantum simulation** 2021
A. Cervera-Liarta, J. S. Kottmann and A. Aspuru-Guzik
PRX Quantum **2**, 020329 (2021).
- Tequila: A platform for rapid development of quantum algorithms** 2021
J. S. Kottmann, S. Alperin-Lea, T. Tamayo-Mendoza, A. Cervera-Liarta et. al.
Quantum Sci. Technol. **6** 024009
- Data Re-uploading for a Universal Quantum Classifier** 2020
A. Pérez-Salinas, A. Cervera-Liarta, E. Gil-Fuster, J. I. Latorre
Quantum **4**, 226 (2020).
- Quantum Circuits for Maximally Entangled States** 2019
A. Cervera-Liarta, J. I. Latorre, D. Goyeneche
Physical Review A **100**, 022342 (2019).
- Exact Ising Simulation on a Quantum Computer** 2018
A. Cervera-Liarta
Quantum **2**, 114 (2018).
- Multipartite Entanglement in Spin Chains and the Hyperdeterminant** 2018
A. Cervera-Liarta, A. Gasull, J. I. Latorre and G. Sierra.
Journal of Phys. A: Math. Theor. **51**, 505301 (2018).
- Maximal Entanglement in High Energy Physics** 2017
A. Cervera-Liarta, J. I. Latorre, J. Rojo and L. Rottoli
SciPost Phys. **3**, 036 (2017).
- Operational Approach to Bell Inequalities: Application to qutrits** 2016
D. Alsina, A. Cervera, D. Goyeneche, J. I. Latorre and K. Zyczkowski
Phys. Rev. A **94**, 032102 (2016).

Invited Talks and Seminars (a selection)

The full list can be found at my webpage <http://albac1.github.io>.

- Noisy Intermediate-Scale Quantum algorithms** CERN
Jul 15, 2021
Perspectives on Quantum Sensing and Computation for Particle Physics

The Chronicles of Entangland, the foundation of the SC town <i>Qiskit Europe Hackathon</i>	IBM May 26, 2021
The Meta-Variational Quantum Eigensolver	Oxford Quantum Information Society May 20, 2021
Experimental high-dimensional GHZ entanglement with superconducting transmon qutrits , Pulse-level Quantum Control Workshop	Chicago Quantum Exchange May 18, 2021
Maximal entanglement in High-Energy physics <i>9th Biennial Workshop of the APS Topical Group on Hadronic Physics</i>	APS Apr 15, 2021
The Meta-Variational Quantum Eigensolver <i>March Meeting</i>	APS Mar 18, 2021
Noisy Intermediate-Scale Quantum algorithms <i>Belgian Quantum Physics Initiative colloquium</i>	Académie Royale de Belgique Mar 4, 2021
Please, feed the quantum troll! <i>Q-Hack</i>	Xanadu Quantum Computing Feb 19, 2021
Data re-uploading for a universal quantum classifier <i>Quantum Techniques in Machine Learning</i>	Zapata Computing Nov 12, 2020
Maximal Entanglement in High Energy Physics <i>Workshop on Quantum Entanglement at Collider Energies.</i>	CFSN Stony Brook, NY Sep 11, 2018

Courses and Schools

Variational Quantum Computing <i>Summer School on Quantum and Q-Inspired Computing</i>	Universidad Internacional Menéndez-Pelayo Sep 7, 2021
Noisy Intermediate-Scale Quantum Algorithms <i>Summer School "Machine Learning in Quantum Physics and Chemistry"</i>	Warsaw, Poland Aug 25, 2021
Quantum Computing in the NISQ era <i>Talk in Quantum Technologies Winter School</i>	UCL Dec 10, 2020
Bojos per la Supercomputació <i>Introductory course in quantum computation for high-school students</i>	BSC 26 Apr – 04 May, 2019
The Quantum Revolution <i>Seminar at Master in Finance</i>	ESADE Business School Jun 07, 2018

Pannels

Quantum Software Ecosystem <i>Pannel discussion with industry and academic members</i>	IEEE Services Sep 9 2021
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Outreach

Mentorship programs	
Quantum Open Source Foundation mentorship program <i>Mentor</i>	QOSF Sep 2020 – Jan 2021
Girls E-Mentorship program <i>Mentor</i>	GEM Sep 2020 – June 2021
Pannels	
Women in Physics path <i>Organized by the Equality commission from the Physics Faculty</i>	Universitat de Barcelona Mar 3 2021
Key-note speech	
Margarita Salas Honoris Causa PhD act <i>Talk "De las computadoras a los ordenadores"</i>	Universidad de Extremadura Feb 2 2019

Bojos de la Ciència
Speech about Bojos per la Supercomputació program

Fundació Catalunya-La Pedrera
Dec 10 2018

Bojos de la Ciència
Speech at Master grants act

Fundació Catalunya-La Pedrera
Oct 16 2018

Articles.....

Computación Cuántica en la Nube **RSEF**
Revista Española de Física *Mar 2020*

How I became a quantum computation scientist
Medium article for @qiskit *Jul 2018*

Contributing Writer **Quantum World Association**
Medium articles, @quantum_wa. *2018 – 2019*

Selected Talks.....

A selection of some popular science talks and contributions.

Quantum Calling **K-W Quantum Enthusiasts Meetup**
Waterloo Quantum Meet-up *Jun 18, 2020*

Quantica **CCCB**
Quantum computing talk and participation in the exhibition (video) *Apr 10-Sep 26, 2019*

De las computadoras a los ordenadores **Margarita Salas Honoris Causa PhD event**
Badajoz, Spain *Feb 26, 2019*

Technology to manipulate Nature **El País con tu Futuro**
Madrid, Spain *Dec 18, 2018*

Quantum Computation: a new paradigm **TEDx talk**
Sant Feliu de Llobregat, Barcelona, Spain *Sep 15, 2018*

Quantum Computation **Cosmocaixa (Science Museum)**
Researcher's Night 2018 *Sep 28, 2018*

Other skills

Programming Languages.....

Classical: Fortran, Python, Mathematica.

Quantum: QisKit (IBM), Qiskit Pulse (IBM), pyquil (Rigetti Computing), Cirq (Google), Tequila (MatterLab)

Languages.....

English (fluent), Spanish (mothertongue), Catalan (mothertongue).

Social Media.....

Twitter: Creator and manager of research group's account, @QUANTIC_BSC (until Jul 2019) and @QRSToronto.

Media: Several interviews in Spanish national newspapers and participated in radio programs (see my personal webpage for more information and links).