

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 PI (budget: 22M €)</i>	Barcelona Supercomputing Center 2021 – Present
Quantum Matter International Conference 2022 <i>Scientific committee.</i>	Barcelona 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 Pierls 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
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Publications

Noisy intermediate-scale quantum algorithms <i>K. Bharti, A. Cervera-Lierta, T. H. Kyaw, T. Haug, et. al.</i> Rev. Mod. Phys. 94 , 015004 (2022).	Review 2022
Toward Reliability in the NISQ Era: Robust Interval Guarantee for Quantum Measurements on Approximate States <i>M. Weber, A. Anand, A. Cervera-Lierta, J. S. Kottmann, T. H. Kyaw, B. Li, A. Aspuru-Guzik, C. Zhang, Z. Zhao</i> arXiv:2110.09793 [quant-ph].	Preprint 2021
Design of quantum optical experiments with Logic Artificial Intelligence <i>A. Cervera-Lierta, M. Krenn, A. Aspuru-Guzik</i> arXiv:2109.13273 [quant-ph].	Preprint 2021
Learning Interpretable Representations of Entanglement in Quantum Optics Experiments using Deep Generative Models <i>D. Flam-Shepherd, T. Wu, X. Gu, A. Cervera-Lierta, M. Krenn, A. Aspuru-Guzik</i> arXiv:2109.02490 [cs.LG].	Preprint 2021
Experimental high-dimensional Greenberger–Horne–Zeilinger entanglement with superconducting transmon qutrits <i>A. Cervera-Lierta, M. Krenn, A. Aspuru-Guzik, A. Galda</i> arXiv:2104.05627 [quant-ph] (Accepted Phys. Rev. Appl.)	2021
The Meta-Variational Quantum Eigensolver (Meta-VQE): Learning energy profiles of parameterized Hamiltonians for quantum simulation <i>A. Cervera-Lierta, J. S. Kottmann and A. Aspuru-Guzik</i> PRX Quantum 2 , 020329 (2021).	2021
Tequila: A platform for rapid development of quantum algorithms <i>J. S. Kottmann, S. Alperin-Lea, T. Tamayo-Mendoza, A. Cervera-Lierta et. al.</i> Quantum Sci. Technol. 6 024009	2021
Data Re-uploading for a Universal Quantum Classifier <i>A. Pérez-Salinas, A. Cervera-Lierta, E. Gil-Fuster, J. I. Latorre</i> Quantum 4 , 226 (2020).	2020
Quantum Circuits for Maximally Entangled States <i>A. Cervera-Lierta, J. I. Latorre, D. Goyeneche</i> Physical Review A 100 , 022342 (2019).	2019
Exact Ising Simulation on a Quantum Computer <i>A. Cervera-Lierta</i> Quantum 2 , 114 (2018).	2018
Multipartite Entanglement in Spin Chains and the Hyperdeterminant <i>A. Cervera-Lierta, A. Gasull, J. I. Latorre and G. Sierra.</i> Journal of Phys. A: Math. Theor. 51 , 505301 (2018).	2018
Maximal Entanglement in High Energy Physics <i>A. Cervera-Lierta, J. I. Latorre, J. Rojo and L. Rottoli</i> SciPost Phys. 3 , 036 (2017).	2017
Operational Approach to Bell Inequalities: Application to qutrits <i>D. Alsina, A. Cervera, D. Goyeneche, J. I. Latorre and K. Zyczkowski</i> Phys. Rev. A 94 , 032102 (2016).	2016

Invited Talks and Seminars (a selection)

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

Tecnologies quàntiques: present i futur <i>ICCUB Colloquia.</i>	Universitat de Barcelona <i>Feb 16, 2022</i>
Design of quantum optical experiments with logic artificial intelligence <i>Quantum Optics group seminar.</i>	MPQ <i>Oct 29, 2021</i>
Noisy Intermediate-Scale Quantum algorithms <i>Perspectives on Quantum Sensing and Computation for Particle Physics</i>	CERN <i>Jul 15, 2021</i>
The Chronicles of Entangland, the foundation of the SC town <i>Qiskit Europe Hackathon</i>	IBM <i>May 26, 2021</i>
The Meta-Variational Quantum Eigensolver	Oxford Quantum Information Society <i>May 20, 2021</i>
Experimental high-dimensional GHZ entanglement with superconducting transmon qutrits , Pulse-level Quantum Control Workshop	Chicago Quantum Exchange <i>May 18, 2021</i>
Maximal entanglement in High-Energy physics <i>9th Biennial Workshop of the APS Topical Group on Hadronic Physics</i>	APS <i>Apr 15, 2021</i>
The Meta-Variational Quantum Eigensolver <i>March Meeting</i>	APS <i>Mar 18, 2021</i>
Noisy Intermediate-Scale Quantum algorithms <i>Belgian Quantum Physics Initiative colloquium</i>	Académie Royale de Belgique <i>Mar 4, 2021</i>
Please, feed the quantum troll! <i>Q-Hack</i>	Xanadu Quantum Computing <i>Feb 19, 2021</i>
Data re-uploading for a universal quantum classifier <i>Quantum Techniques in Machine Learning</i>	Zapata Computing <i>Nov 12, 2020</i>
Maximal Entanglement in High Energy Physics <i>Workshop on Quantum Entanglement at Collider Energies.</i>	CFSN Stony Brook, NY <i>Sep 11, 2018</i>

Courses and Schools

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

Pannels

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

Mentorship programs	
Quantum Open Source Foundation mentorship program <i>Mentor</i>	QOSF <i>Sep 2020 – Jan 2021</i>

Girls E-Mentorship program

Mentor

GEM

Sep 2020 – June 2021

Pannels.....

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

Key-note speech.....

Margarita Salas Honoris Causa PhD act

Talk "De las computadoras a los ordenadores"

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

Revista Española de Física

RSEF

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

Selected Talks.....

A selection of some popular science talks and contributions.

Computación Cuántica

Live Talks Cosmocaixa

Cosmocaixa (Barcelona)

Feb 16, 2022

Quantum Spain

Quantum Barcelona and Madrid meet-up.

Meet-up

Dec 13, 2021/Feb 9, 2022

Quantum Calling

Waterloo Quantum Meet-up

K-W Quantum Enthusiasts Meetup

Jun 18, 2020

Quantica

Quantum computing talk and participation in the exhibition (video)

CCCB

Apr 10-Sep 26, 2019

De las computadoras a los ordenadores

Badajoz, Spain

Margarita Salas Honoris Causa PhD event

Feb 26, 2019

Technology to manipulate Nature

Madrid, Spain

El País con tu Futuro

Dec 18, 2018

Quantum Computation: a new paradigm

Sant Feliu de Llobregat, Barcelona, Spain

TEDx talk

Sep 15, 2018

Quantum Computation

Researcher's Night 2018

Cosmocaixa (Science Museum)

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).