Alba Cervera-Lierta | CV

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Education

Doctor of Philosophy (PhD) — **Universitat de Barcelona**
Supervisor: Dr. José Ignacio Latorre — *2015 – 2019*

Master in Astrophysics, Particle Physics and Cosmology — **Universitat de Barcelona**
Specialized in Particle Physics and Gravitation. — *2014 – 2015*

Bachelor in Physics — **Universitat de Barcelona**
Specialized in Fundamental Physics — *2009 – 2014*

Experience and Collaborations

Research

Senior Researcher — **Barcelona Supercomputing Center**
Quantic group (CASE department) — *2021 – Present*

Postdoctoral Fellow — **University of Toronto**
Alán Aspuru-Guzik group — *2019 – 2021*

Technical Researcher — **Barcelona Supercomputing Center**
Quantic group (CASE department) — *2017 – 2019*

Specialized Technician — **Universitat de Barcelona**
Project: "Entanglement, tensor networks and cold gases" — *2014*

Visitor

Center of Quantum Technologies — **National University of Singapore**
Prof. Kwek Leong Chuan group. — *May 2017*

Instituto de Física Teórica — **CSIC**
Dr. César Gómez's group. — *Feb 2017*

Grupo de investigación en Información y Computación Cuántica — **Universidad Politécnica de Madrid**
Dr. Vicente Martín group — *Sep 2016*

Rudolph Pierls Institute for Theoretical Physics — **University of Oxford**
Dr. Juan Rojo's group. — *Jan - May 2016*

Organization

Quantum Research Seminars Toronto. — **Virtual**
Co-organizer and chair. Youtube: Quantum Research Seminars Toronto. — *2020 – 2021*

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

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

Publications

Toward Reliability in the NISQ Era: Robust Interval Guarantee for Quantum Measurements on Approximate States — **Preprint** *2021*
M. Weber, A. Anand, A. Cervera-Lierta, 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-Lierta, 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-Lierta, 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-Lierta, M. Krenn, A. Aspuru-Guzik, A. Galda
arXiv:2104.05627 [quant-ph].

Noisy intermediate-scale quantum (NISQ) algorithms — **Review** *2021*
K. Bharti, A. Cervera-Lierta, 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-Lierta, 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-Lierta et. al.
Quantum Sci. Technol. **6** 024009

Data Re-uploading for a Universal Quantum Classifier — *2020*
A. Pérez-Salinas, A. Cervera-Lierta, E. Gil-Fuster, J. I. Latorre
Quantum **4**, 226 (2020).

Quantum Circuits for Maximally Entangled States — *2019*
A. Cervera-Lierta, J. I. Latorre, D. Goyeneche
Physical Review A **100**, 022342 (2019).

Exact Ising Simulation on a Quantum Computer — *2018*
A. Cervera-Lierta
Quantum **2**, 114 (2018).

Multipartite Entanglement in Spin Chains and the Hyperdeterminant — *2018*
A. Cervera-Lierta, 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-Lierta, 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://albacl.github.io`.

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

The Chronicles of Entangland, the foundation of the SC town — **IBM**
Qiskit Europe Hackathon — *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 — **APS**
9th Biennial Workshop of the APS Topical Group on Hadronic Physics — *Apr 15, 2021*

The Meta-Variational Quantum Eigensolver — **APS**
March Meeting — *Mar 18, 2021*

Noisy Intermediate-Scale Quantum algorithms — **Académie Royale de Belgique**
Belgian Quantum Physics Initiative colloquium — *Mar 4, 2021*

Please, feed the quantum troll! — **Xanadu Quantum Computing**
Q-Hack — *Feb 19, 2021*

Data re-uploading for a universal quantum classifier — **Zapata Computing**
Quantum Techniques in Machine Learning — *Nov 12, 2020*

Maximal Entanglement in High Energy Physics — **CFSN Stony Brook, NY**
Workshop on Quantum Entanglement at Collider Energies. — *Sep 11, 2018*

Courses and Schools

Variational Quantum Computing — **Universidad Internacional Menéndez-Pelayo**
Summer School on Quantum and Q-Inspired Computing — *Sep 7, 2021*

Noisy Intermediate-Scale Quantum Algorithms — **Warsaw, Poland**
Summer School "Machine Learning in Quantum Physics and Chemistry" — *Aug 25, 2021*

Quantum Computing in the NISQ era — **UCL**
Talk in Quantum Technologies Winter School — *Dec 10, 2020*

Bojos per la Supercomputació — **BSC**
Introductory course in quantum computation for high-school students — *26 Apr – 04 May, 2019*

The Quantum Revolution — **ESADE Business School**
Seminar at Master in Finance — *Jun 07, 2018*

Pannels

Quantum Software Ecosystem — **IEEE Services**
Pannel discussion with industry and academic members — *Sep 9 2021*

Outreach

Mentorship programs

Quantum Open Source Foundation mentorship program — **QOSF**
Mentor — *Sep 2020 – Jan 2021*

Girls E-Mentorship program — **GEM**
Mentor — *Sep 2020 – June 2021*

Pannels

Women in Physics path — **Universitat de Barcelona**
Organized by the Equality commission from the Physics Faculty — *Mar 3 2021*

Key-note speech

Margarita Salas Honoris Causa PhD act — **Universidad de Extremadura**
Talk "De las computadoras a los ordenadores" — *Feb 2 2019*

Bojos de la Ciència — **Fundació Catalunya-La Pedrera**
Speech about Bojos per la Supercomputació program — *Dec 10 2018*

Bojos de la Ciència — **Fundació Catalunya-La Pedrera**
Speech at Master grants act — *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).