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

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

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

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

Visiting Scholar — **University of Oxford**
Four months stay at Dr. Juan Rojo's group. — *2016*

Specialized Technician — **Universitat de Barcelona**
Project: "Entanglement, tensor networks and cold gases" — *2014*
Simulation of frustrated systems using tensor networks algorithms.

Organization

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

Teaching

Teacher Assistant — **Universitat Autònoma de Barcelona**
2017 – 2019

Teacher Assistant — **Universitat de Barcelona**
2016 – 2017

Awards and Honors

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

Teach Me QISKit Award — **IBM**
For writing and programming an interactive self-paced Jupyter Notebook tutorial that explains a specific focus topic in quantum computing using QISKit and the IBM Q Experience — *Jun 2018*

Publications

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

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

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

Multipartite Entanglement in Spin Chains and the Hyperdeterminant
A. Cervera-Lierta, A. Gasull, J. I. Latorre and G. Sierra. *2018*
Journal of Phys. A: Math. Theor. **51**, 505301 (2018).

Maximal Entanglement in High Energy Physics
A. Cervera-Lierta, J. I. Latorre, J. Rojo and L. Rottoli *2017*
SciPost Phys. **3**, 036 (2017).

Operational Approach to Bell Inequalities: Application to qutrits
D. Alsina, A. Cervera, D. Goyeneche, J. I. Latorre and K. Zyczkowski *2016*
Phys. Rev. A **94**, 032102 (2016).

Preprints

Noisy intermediate-scale quantum (NISQ) algorithms **Review**
K. Bharti, A. Cervera-Lierta, T. H. Kyaw, T. Haug, et. al. *2021*
arXiv:2101.08448 [quant-ph]

Tequila: A platform for rapid development of quantum algorithms
J. S. Kottmann, S. Alperin-Lea, T. Tamayo-Mendoza, A. Cervera-Lierta et. al. *2020*
arXiv:2011.03057 [quant-ph].

The Meta-Variational Quantum Eigensolver (Meta-VQE):
Learning energy profiles of parameterized Hamiltonians for quantum simulation *2020*
A. Cervera-Lierta, J. S. Kottmann and A. Aspuru-Guzik, arXiv:2009.13545 [quant-ph].

Maximal Entanglement: Applications in Quantum Information and Particle Physics **PhD Thesis**
A. Cervera-Lierta *2019*
arXiv:1906.12099 [quant-ph].

Seminars and Talks

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

Designing Variational Quantum Algorithms with Tequila
Quantum Conversations by the Bay *Oct 28, 2020*

Testing and designing quantum algorithms for the NISQ era **INT**
Quantum Computing and Simulation on Near-Term Devices *Oct 21, 2020*

Maximal Entanglement in Quantum Computation **BSC**
Severo Ochoa Doctoral Symposium *May 07, 2019*

Maximal Entanglement: Applications to Quantum Computation **University of Toronto**
and Particle Physics *Mar 01, 2019*
MatterLab group meeting

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

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

Exact Simulation of a QPT in a Quantum Computer **Universitat de Barcelona**
Workshop on Quantum Phase Transitions *Apr 06, 2018*

Emergence of Gauge Symmetry from a **Universidad Complutense de Madrid**
Maximal Entanglement Principle *Sep 21, 2016*
Seminar

Courses

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*

Outreach

Mentorship programs

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

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

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*

Talks

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*

High School talks
Every year, for the International Day of Women and Girl in Science and the Science Week

Other skills

Programming Languages

Classical: Fortran, Python, Latex, Mathematica.

Quantum: QISKit (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 (present).

Webpage: Research group webpage manager, quantic.bsc.es (until Nov 2018).

Media: I have had several interviews in Spanish national newspapers and participated in radio programs (see personal webpage for more information and links).