

# Alba Cervera Lierta | CV

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## Education

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

## Experience and Collaborations

### Research

<b>Postdoctoral Fellow</b> <i>Alán Aspuru-Guzik group</i>	<b>University of Toronto</b> 2019 –
<b>Technical Researcher</b> <i>Quantic group (CASE department)</i>	<b>Barcelona Supercomputing Center (BSC)</b> 2017 – 2019
<b>Visiting Scholar</b> <i>Dr. César Gómez's group.</i>	<b>Instituto de Física Teórica (CSIC)</b> Feb 2017
<b>Visiting Scholar</b> <i>Four months stay at Dr. Juan Rojo's group.</i>	<b>University of Oxford</b> 2016
<b>Specialized Technician</b> <i>Project: "Entanglement, tensor networks and cold gases"</i> Simulation of frustrated systems using tensor networks algorithms.	<b>Universitat de Barcelona</b> 2014

### Organization

<b>Quantum Research Seminars Toronto.</b> <i>Co-organizer. Event creator, organizer and chair. Youtube: Quantum Research Seminars Toronto.</i>	<b>Virtual</b> 2020 –
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### Teaching

<b>Teacher Assistant</b>	<b>Universitat Autònoma de Barcelona</b> 2017 – 2019
<b>Teacher Assistant</b>	<b>Universitat de Barcelona</b> 2016 – 2017

## Awards and Honors

<b>PhD Excellent Cum Laude</b>	<b>Universitat de Barcelona</b> Jun 2019
<b>Teach Me QISKit Award</b> <i>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</i>	<b>IBM</b> Jun 2018

## Publications

<b>Data Re-uploading for a Universal Quantum Classifier</b> <i>A. Pérez-Salinas, A. Cervera-Lierta, E. Gil-Fuster, J. I. Latorre</i> Quantum <b>4</b> , 226 (2020).	2020
<b>Quantum Circuits for Maximally Entangled States</b> <i>A. Cervera-Lierta, J. I. Latorre, D. Goyeneche</i> Physical Review A <b>100</b> , 022342 (2019).	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.....

## Tequila: A platform for rapid development of quantum algorithms

Jakob S. Kottmann, Sumner Alperin-Lea, Teresa Tamayo-Mendoza, Alba 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 and Particle Physics

University of Toronto

MatterLab group meeting

Mar 01, 2019

### 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

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### 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

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### 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).