Cristóbal Lledó Veloso

cristobal.lledov@gmail.com
http://crislledo.com/
Citizenship: Chilean Born

Employment

2025– **Postdoctoral Researcher funded by the ANID Fondecyt fellowship,** project *Strongly driven circuit QED devices*, Department of Physics, Faculty of Physical and Mathematical Sciences, University of Chile. Group led by Prof. Felipe Barra.

2021–2025 **Postdoctoral research fellow,** Institut Quantique and Département de Physique, Université de Sherbrooke, Sherbrooke, QC, Canada. Group led by Prof. Alexandre Blais.

Education

2017 – 2021 **Ph.D. in Quantum physics, University College London**.
Thesis title: *Dissipative phase transitions in light-matter systems.*
Supervisor: Prof. Marzena Szymańska.
Link to thesis: https://discovery.ucl.ac.uk/id/eprint/10135509/

2015 – 2017 **M.Sc. in Physics, University of Chile**.
Thesis title: *Stochastic thermodynamics for open quantum systems in the repeated interaction scheme.*
Supervisor: Prof. Felipe Barra.

2011 – 2014 **B.Sc. in Physics, University of Chile**.

Publications

Patents

1. C. Lledó, A. Moulinas, J. Cohen, A. Blais, R. Dassonneville, A. Bienfait, B. Huard, and R. Shillito, "Method of operating a quantum system," WO2024023176A1, Feb. 2024. URl: https://cnrs.hal.science/hal-04940042.

Journal Articles

1. M. F. Dumas, B. Groleau-Paré, A. McDonald, M. H. Muñoz-Arias, C. Lledó, B. D'Anjou, and A. Blais, "Measurement-induced transmon ionization," *Phys. Rev. X*, vol. 14, p. 041 023, 4 Oct. 2024. DOI: 10.1103/PhysRevX.14.041023.
2. C. Lledó, R. Dassonneville, A. Moulinas, J. Cohen, R. Shillito, A. Bienfait, B. Huard, and A. Blais, "Cloaking a qubit in a cavity," *Nat. Commun.*, vol. 14, no. 1, p. 6313, 2023. DOI: 10.1038/s41467-023-42060-5.
3. M. H. Muñoz-Arias, C. Lledó, and A. Blais, "Qubit readout enabled by qubit cloaking," *Phys. Rev. Appl.*, vol. 20, p. 054 013, 5 Nov. 2023. DOI: 10.1103/PhysRevApplied.20.054013.
4. C. Lledó, I. Carusotto, and M. H. Szymańska, "Polariton condensation into vortex states in the synthetic magnetic field of a strained honeycomb lattice," *SciPost Phys.*, vol. 12, p. 068, 2022. DOI: 10.21468/SciPostPhys.12.2.068.

5 T. K. Mavrogordatos and C. Lledó, "Second-order coherence of fluorescence in multi-photon blockade," *Opt. Commun.*, vol. 486, p. 126 791, 2021, ISSN: 0030-4018. DOI: https://doi.org/10.1016/j.optcom.2021.126791.

6 C. Lledó and M. H. Szymańska, "A dissipative time crystal with or without Z_2 symmetry breaking," *New J. Phys.*, vol. 22, no. 7, p. 075 002, Jul. 2020. DOI: 10.1088/1367-2630/ab9ae3.

7 C. Lledó, T. K. Mavrogordatos, and M. H. Szymańska, "Driven Bose-Hubbard dimer under nonlocal dissipation: A bistable time crystal," *Phys. Rev. B*, vol. 100, p. 054 303, 5 Aug. 2019. DOI: 10.1103/PhysRevB.100.054303.

8 F. Barra and C. Lledó, "The smallest absorption refrigerator: The thermodynamics of a system with quantum local detailed balance," *Eur. Phys. J. Spec. Top.*, vol. 227, no. 3, pp. 231–246, 2018. DOI: 10.1140/epjst/e2018-00084-x.

9 F. Barra and C. Lledó, "Stochastic thermodynamics of quantum maps with and without equilibrium," *Phys. Rev. E*, vol. 96, p. 052 114, 5 Nov. 2017. DOI: 10.1103/PhysRevE.96.052114.

Peer review

Nature Communications, Communication Physics, Physical Review Letters, Physical Review A, Physical Review B, New Journal of Physics, Entropy, JOSA B.

Talks and participation in conferences, workshops, and summer schools

2025 *Conference on Emergent Phenomena in Quantum Systems and Beyond*, 31 March - 4 April, Faculty of Mathematical and Physical Sciences (FCFM) of the University of Chile, Santiago, Chile.
Contributed talk: Ionization in circuit QED during measurement and gates.

2024 *Colloquium at the Nanoscale and Quantum Phenomena Institute, Ohio University*, 7 November, Athens, Ohio, USA.
Invited colloquium: Measuring the State of a Superconducting Qubit – Successes and Failures of Dispersive Readout

Quantum Hardware workshop, 28-31 October, Institute for Mathematical and Statistical Innovation, Chicago, Illinois, USA.
Invited talk: Measurement-induced transmon ionization.

APS March Meeting 2024, 3-8 March, Minneapolis, Minnesota, USA.
Invited talk: Qubit cloaking and readout.

Seminar at Faculty of Physical and Mathematical Sciences, University of Chile, 24 January, Santiago, Chile.
Invited talk: The mysterious case of qubit readout in circuit QED.

CircuitQED@20, 10-12 January, Yale University, New Haven CT, United States.
Poster presentation.

2023 *Fall 202/ INTRIQ meeting*, 17 - 18 October, Bromont, Quebec, Canada.
Contributed talk: Dispersive readout in circuit QED.

Talks and participation in conferences, workshops, and summer schools (continued)

Superconducting Quantum Device Workshop 202/, 26 - 30 June, Jouvence, Quebec, Canada.
Invited talk: Design for test. (Tutorial on superconducting qubit readout and gates).

2022 *Quantum Optics and Solid State, QUOST VIII*, 5 - 7 December, Puerto Varas, Chile.
Contributed talk: Cloaking a qubit in a cavity.

Quantum Cavities Workshop, 29 May - 1 June, Jouvence, Quebec, Canada.
Poster presentation.

(Online) WE-Heraeus-Seminar: Lattice-based Quantum Simulation, 28 November - 1 December, Bad Honnef, Germany.
Poster presentation.

(Online) Quantum Thermodynamics Conference 2022, 27 June - 1 July, Belfast, UK.

2021 *(Online) Quantum Computation and Sensing summer school*, 21 June - 2 July, Galileo Galilei Institute.

2020 *(Online)* Quantum Thermodynamics Workshop 23-27 November.

2019 *CCPQ Dynamics of Complex Quantum Systems* workshop, 5 - 8 August, Windsor, UK.
Poster presentation.

2018 *Correlations and Entanglement with Photons in Cavities* workshop, 2 - 6 September, Chicheley, UK.
Poster presentation.

Quantum Fluids of Light and Matter Les Houches Summer School, 24 - 29 June, Les Houches, France.
Poster presentation.

Topical Research Meeting on Topological States in Strongly Interacting Light-Matter Systems, 19 - 20 March, Milton Keynes, UK.

2017 *Fundamental Aspects of Statistical Physics and Thermodynamics* workshop, 27 - 30 March, Zentrum für interdisziplinäre Forschung (ZIF), Beielefeld, Germany.
Poster presentation.

2016 *Thermodynamics and Non-equilibrium Phenomena at Quantum Interfaces of Light and Matter* summer school, 19 - 24 September, Cambridge, UK.

Conference organization

2018 *Correlations and Entanglement with Photons in Cavities* workshop, 2 - 6 September, Chicheley, UK.

Fellowships, Scholarships, and Awards

Fellowships

2025-2028 Agencia Nacional de Investigación y Desarrollo (ANID) Postdoctoral Fellowship. Project No. 3250130.

Scholarships

2017-2021 National Scientific and Technological Research Commission (CONICYT/ANID) Scholarship for doctoral studies in a foreign country. Contract No. 72180352.

2016-2017 National Scientific and Technological Research Commission (CONICYT/ANID) Scholarship for master's degree studies at Chilean Universities. Contract No. 22161809.

Awards

2014 Outstanding student of B.Sc. in Physics during the year 2014 (grade>5.7/7.0), FCFM, University of Chile.

Supervision

2025- I am currently co-supervising Alonso Torres, a master's student in physics at the Faculty of Physical and Mathematical Sciences, University of Chile.

2021-2024 During my postdoctoral position in Prof. Alexandre Blais' group at Sherbrooke, I had the opportunity to co-supervise the internship of the undergraduate student Adrien Moulinas, with whom I co-authored an article [C. Lledó et al., Nat.Commun. 2023] and a patent. Additionally, I worked closely with the master's student Marie Frédérique, leading to a publication [M.F. Dumas et al., PRX 2024]. I am also currently collaborating with PhD student Othmane Benhayoune-Khadraoui on the main work of his thesis.

Teaching Experience

Each teaching assistant (TA) position listed below at the Department of Physics, Faculty of Physical and Mathematical Science, University of Chile, involved conducting in-class demonstrations, preparing exercises and homework, and grading assignments, homework, and exams. Each course lasted one semester.

2016 (TA) *Quantum Mechanics II* (FI7002). Postgraduate course. Lecturer: Prof. Fernando Lund.

(TA) *Classical Mechanics* (FI3101). Lecturer: Prof. Felipe Barra.

2015 (TA) *Statistical Mechanics* (FI4104). Lecturer: Prof. Rodrigo Soto.

(TA) *Thermodynamics* (FI2004). Lecturer: Prof. Guillermo Blanc.

2014 (TA) *Modern Physics* (FI3102). Lecturer: Prof. Fernando Lund.

Internships

The Department of Physics at FCFM, University of Chile, organized one-month research internships every summer. I participated two times during my bachelor's studies and once before starting my master's.

2015 Jan — *Calculation of the dynamical aspects of a boundary-driven spin chain undergoing Landau-Zener transitions*. Supervisor: Prof. Felipe Barra.

2014 Dec — *Calculation of thermodynamic properties of line defects in solids*. Supervisor: Prof. Fernando Lund.

2014 Jan — *Study of the ballistic scattering of a quantum particle in an ordered 1D potential*. Supervisor: Prof. Felipe Barra.

Skills

Languages	English: Full working proficiency. Spanish: Mothertongue.
Computational skills	Advanced knowledge: Python, Mathematica, LaTeX. Intermediate knowledge: XMDS (stochastic simulations), Computing Clusters. Basic knowledge: XML, C, Matlab, Linux, WordPress (website design), AutoDesk, and Illustrator (physical systems schematics).

Last modified: April 2, 2025