

JOAN J. CÁCERES

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RESEARCH EXPERIENCE

Google Quantum AI March 2026 - June 2026
Quantum Research Student – Coherence Team *Santa Barbara, CA, USA*

- Project: Coupler reset.
- Selected for a research internship in the Coherence team to develop and characterize coupler reset protocols for improving the performance of superconducting quantum processors.

Quantronics Group, SPEC, CEA Paris-Saclay January 2023 - July 2026 (expected)
Doctoral Research *Saclay, France*

- Designed, nanofabricated, and characterized hybrid semiconductor-superconductor quantum circuits.
- Developed the theoretical description of a noise-protected hybrid qubit ([HybridSuperQubits](#)) and an NRG-inspired framework for multimodal circuit simulation ([sccircuits](#)).
- Publications: [arXiv:2604.01145](#) (2026); one additional manuscript in preparation.
- Advisors: Marcelo Goffman, Hugues Pothier.

Quantronics Group, SPEC, CEA Paris-Saclay January 2022 - April 2022
Research Intern *Saclay, France*

- Theoretical modeling of a hybrid qubit combining fermionic and bosonic degrees of freedom, contributing to [arXiv:2604.01145](#).
- FEM electromagnetic simulations (HFSS) for superconducting circuit design.
- Supervision: Emmanuel Flurin

Centro Atómico Bariloche, Balseiro Institute August 2021 - December 2022
BSc & MSc Research Student *Bariloche, Argentina*

- Derived analytical methods for determining optimal driving parameters for fast single-qubit and two-qubit gates using Landau-Zener-Stückelberg-Majorana (LZSM) transitions under strong sinusoidal driving.
- Analyzed the interplay between pulse amplitude, frequency, and environmental decoherence to identify driving regimes that maximize gate fidelity.
- Published in [Phys. Rev. A 108, 052619](#).
- Advisor: Daniel Domínguez. Co-advisor: María José Sánchez.

EDUCATION

PhD in Physics *January 2023 - July 2026 (expected)*
Université Paris-Saclay. France.
Thesis project: Fermionic-bosonic qubit
Advisors: Marcelo Goffman, Hugues Pothier.

MSc. Physics *July 2021 - December 2022*
Balseiro Institute. National University of Cuyo, Argentina
Scholarship holder of the National Atomic Energy Commission.

Thesis project: Coherent optimization of a quantum gate based in the Landau-Zener-Stuckelberg interference.

Advisor: Daniel Dominguez.

BSc. Physics

August 2019 - December 2021

Balseiro Institute. National University of Cuyo, Argentina

Scholarship holder of the National Atomic Energy Commission.

Thesis project: Study of a new type of gates for quantum computing.

Advisor: Daniel Dominguez.

Undergraduate Physics student

March 2018 - July 2019

Science College, National University of Engineering, Perú.

Undergraduate studies in Industrial Engineering

March 2017 - December 2017

Industrial Engineering College, National University of Engineering, Perú.

PUBLICATIONS

J.J. Cáceres, D. Sanz Marco, J. Ortuzar, E. Flurin, C. Urbina, H. Pothier, M. F. Goffman. *Efficient modeling of a multimodal non-linear superconducting circuit.* (in preparation)

J.J. Cáceres, D. Sanz Marco, J. Ortuzar, E. Flurin, C. Urbina, H. Pothier, M. F. Goffman, F. J. Matute-Cañadas, A. Levy Yeyati. *FerBo: a noise resilient qubit hybridizing Andreev and fluxonium states.* [arXiv:2604.01145](https://arxiv.org/abs/2604.01145). April 2026.

J.J. Cáceres, D. Domínguez, M.J. Sánchez. *Fast quantum gates based on Landau-Zener-Stückelberg-Majorana transitions.* [Phys. Rev. A 108, 052619](https://arxiv.org/abs/2311.15000). November 2023.

COMPETITIONS & PRIZES

J. J. Cáceres “Alice and Bob Challenge Winner – ETH Quantum Hackathon 2025”

Quantum state tomography from noisy Wigner function measurements using dynamiqs (JAX) and convex optimization.

ETH Zurich – Quantum Hackathon (qHack25)

Zurich, Switzerland

May 2025

Competition Winner

SOFTWARE

J.J. Cáceres. *scircuits: a Python package to simulate multimodal non-linear superconducting circuits.* [DOI 10.5281/zenodo.17751124](https://doi.org/10.5281/zenodo.17751124)

J.J. Cáceres. *HybridSuperQubits: a Python package to simulate hybrid semiconductor-superconductor devices.* github.com/joanjcaceres/HybridSuperQubits

SKILLS

Experimental Nanofabrication, cryogenics, microwave measurements, superconducting circuit design and characterization

Computational Python, C++, C, SQL, Mathematica, Git

Languages Spanish: *Native language*,
English: *Advanced*,
French: *Advanced*,
Portuguese: *Advanced*.

COURSES AND WORKSHOPS

- Open Quantum Systems and Mesoscopic Physics** *December 2025*
Vierumäki, Finland.
- Open Quantum Systems and Mesoscopic Physics** *June 2023*
Hyytiälä, Finland.
- Hybrid Quantum Technologies Workshop and Germanium Day** *April 2023*
Workshop organized by Nanoelectronics group at ISTA and Zurich Instruments.
Klosterneuburg, Austria.
- 57th Rencontres de Moriond** *March 2023*
Quantum Mesoscopic Physics. La Thuile, Italy.
- School on Quantum Computation 2022** *November 2022*
ICTP-SAIFR, Sao Paulo, Brazil.
- 2021 Qiskit Global Summer School on Quantum Machine Learning** *July 2021*
School of Quantum Computing and Quantum Machine Learning using Qiskit.
Organized by IBM Quantum.
- Physics Without Frontiers: Expository Quantum Lecture Series 2020** *November 2020*
Expository Quantum Lecture Series 2020 organised by Abdus Salam International Centre for Theoretical Physics
- Summer School in Mathematics. IMPA** *January 2019 - February 2019*
Scholarship holder of the National Council for Scientific and Technological Development from Brasil
Summer School in Analysis over R. Scientific Initiation Program
Professor: Carlos Gustavo Moreira (*IMPA*)
- IX Southern-Summer School on Mathematical Biology** *January 2020*
Program of the ICTP-SAIFR/IFT-UNESP. Sao Paulo, Brasil
Professor: Roberto Kraenkel (*IFT-UNESP*)
- School on Community Ecology: from patterns to principles** *January 2020*
Program of the ICTP-SAIFR/IFT-UNESP. Sao Paulo, Brasil
Professor: Roberto Kraenkel (*IFT-UNESP*)

CONFERENCE, PRESENTATIONS AND POSTERS

- J. J. Cáceres, D. Sanz, J. Ortuzar, E. Flurin, H. Pothier, C. Urbina, M. F. Goffman** “Efficient modeling of a multimodal fluxonium”
GDR 2426 Quantum Mesoscopic Physics *December 2025*
Aussois, France *Poster*
- J. J. Cáceres, F.J. Matute-Cañadas, D. Sanz, I. Casal, A. Torok, E. Flurin, A. Levy Yeyati, H. Pothier, C. Urbina, M. F. Goffman** “Towards a Fermionic-Bosonic qubit”
Hybrid Superconductor-Semiconductor Devices *April 2025*
Les Diablerets, Switzerland *Poster*

J. J. Cáceres, E. Flurin, H. Pothier, C. Urbina, M. F. Goffman. “Fermionic-Bosonic qubit”
Hybrid Quantum Technologies Workshop *April 2023*
Klosterneuburg, Austria *Poster*

J. J. Cáceres, E. Flurin, H. Pothier, C. Urbina, M. F. Goffman. “Fermionic-Bosonic qubit”
57th Rencontres de Moriond *March 2023*
Quantum Mesoscopic Physics. La Thuile, Italy *Poster*

J. J. Cáceres, D. Dominguez, M. Sanchez. “Coherent optimization of a quantum gate based on the Landau-Zener-Stuckelberg interference”
School on Quantum Computation *November 2022*
ICTP-SAIFR, Sao Paulo, Brazil *Poster*

J. J. Cáceres, D. Dominguez, M. Sanchez. “Quantum gate based in the Landau-Zener-Stuckelberg interference”
107 RAFA - Annual Meeting of Physics *September 2022*
Instituto Balseiro. Centro Atómico Bariloche *Poster*

J. J. Cáceres, L. Tosi. “Electronic characterization of semiconductor junctions based on InAs nanowires”
106 RAFA - Annual Meeting of Physics *October 2021*
Instituto Balseiro. Centro Atómico Bariloche *Conference*

EXTRACURRICULAR EXPERIENCE

Founder of [Los Caminos de Feynman](#). A space to spread the career of physics in Peru as well as opportunities for physics undergraduate students.

Ex general coordinator of the nonprofit organization “[Mundo Nuevo. Youth in action](#)”. A non-profit organization made up of young university students and professionals working for a comprehensive education for children and youth.

Member of the Organization Committee of the IFM-SEI camp 2016 - welcome to another world! in Nuremberg, Germany.

Coordinator and editor of [Cientificos.pe](#). A space for interaction between the Peruvian scientific diaspora around the world.

Member of the Student Association of Theoretical Physics from the National University of Engineering, Perú ([GEFT-UNI](#)).

Manager and teacher of the programming course for children at [Academia Masters](#). A workshop where I teach to more than 25 children about coding with the software Scratch.

Member of the theatre cast of the National Engineering University in 2015.

Studies of cinema direction in the Cultural Centre of the National University of Engineering in 2015.

Worked as teacher of Arduino, high school algebra and high school physics.