

# JOSÉ ANTONIO MARÍN GUZMÁN

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## EDUCATION

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University of Maryland, College Park  
Ph. D., Physics

2021 - Present

University of Costa Rica  
B. Sc., Physics

2016 - 2020

## PUBLICATIONS

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- **J.A. Marín Guzmán**, P. Erker, S. Gasparinetti, M. Huber & N. Yunger Halpern. *DiVincenzo-like criteria for autonomous quantum machines*. Preprint at arXiv:2307.08739 (2023).
- M.A. Ali, P.J. Suria, **J.A. Marín Guzmán**, C. Castillo-Moreno, J.M. Epstein, N. Yunger Halpern & S. Gasparinetti. *Thermally driven quantum refrigerator autonomously resets superconducting qubit*. Preprint at arXiv:2305.16710 (2023).

## RESEARCH EXPERIENCE

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- Graduate research assistant at the Joint Center for Quantum Information and Computer Science (QuICS), advised by Prof. Nicole Yunger Halpern. Current research focused on theoretical design and implementation proposals for autonomous quantum machines. Ancillary interests in measurement-induced phase transitions and quantum dynamics.
- Undergraduate research assistant at the Materials Science and Engineering Research Center (CICIMA). Worked on the theoretical modelling of barocaloric effects in plastic crystals under the supervision of Prof. Gian Guzmán-Verri.

## AWARDS AND PRIZES

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- *Dean's Fellowship* received, University of Maryland (2021).
- *Excellent Presentation award*, Gulf Coast Undergraduate Research Symposium, Rice University (2020).

## SKILLS

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### Programming Languages (Packages)

- Python (Pylab, Pyplot, Matplotlib, Numpy, QuTip)
- Mathematica
- Matlab (Chebfun)

## LANGUAGES

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**English:** Fluent.

**Spanish:** Fluent, native speaker.

**French:** Intermediate level, circa A2.

## ACADEMIC EVENTS

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### Academic talks:

- *Autonomous quantum refrigerator resets superconducting qubit*. Quantum-thermodynamics seminar, University of Maryland (August 2023).
- *Modelling of barocaloric effects in MgNbF<sub>6</sub>*. Gulf Coast Undergraduate Research Symposium, Rice University (October 2020).

### Poster presentations:

- Quantum Thermodynamics Conference (QTD), TU Wien (July 2023).
- Institute for Robust Quantum Simulation (RQS) Workshop, University of Maryland (June 2023).

### Workshops and Schools:

- Participant in *Non-Markovianity in Open Quantum Systems Workshop*, Banff International Research Station, February 2023.
- Participant in *RQS Workshop and Summer School*, Duke University, August 2022.
- Participant in *The Hitchhiker's Guide to Condensed Matter and Statistical Physics: Machine Learning for Condensed Matter*, International Centre for Theoretical Physics, January-February 2021. Online.
- Participant in *A mini-course on Quantum-Information Thermodynamics*, University of São Paulo, November-December 2020. Online.

## TEACHING EXPERIENCE

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**Teaching Assistant (3 courses)**, University of Costa Rica 2020  
Quantum Mechanics I, FS0717 (2020-I, 2020-II); Classical Mechanics II, FS0619 (2020-II)

## MISCELLANY

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### Journal Reviews

- Served as referee for paper submissions in *Physical Review Letters* and *Science Advances*.

### Leadership

- Student representative for Physics and Meteorology, University of Costa Rica Superior Student Council (2019-2020).
- Student representative in the University of Costa Rica Physics and Meteorology department assembly (2019-2020).
- Student representative in the University of Costa Rica Natural Sciences faculty assembly (2019-2020).
- Student representative for Physics and Meteorology, University of Costa Rica Plebiscitary Assembly (2019-2020).