

# ANA PAULA VIZCAYA HERNANDEZ

<https://anavizcaya.github.io/>

Department of Physics ◊ Carnegie Mellon University ◊ Pittsburgh, Pennsylvania, USA

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## EDUCATION

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- Ph.D. in Physics** Expected September 2021  
Carnegie Mellon University, Pittsburgh, PA  
Advisor: Diana Parno  
Field: High energy experimental physics, neutrino physics
- Master of Science in Physics** May 2018  
Carnegie Mellon University, Pittsburgh, PA
- Bachelor of Science in Physics** May 2016  
Universidad Nacional Autónoma de México, Mexico City  
Advisor: Andrés Sandoval Espinosa
- Study Abroad Program at the Netherlands** Spring 2014  
University of Groningen, Netherlands

## RESEARCH EXPERIENCE

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- Graduate Research Assistant**, Carnegie Mellon University January 2017 - Present  
*Karlsruhe Tritium Neutrino Experiment (KATRIN)*
- Characterized, monitored, and simulated the background created by ions. Wrote Python, C++, and ROOT scripts. Designed an ion safety procedure that keeps the background in check
  - Conducted data measurements and wrote Python scripts to study the source plasma
  - Exchanged and calibrated KATRIN main detector to gain better energy resolution
- Tritium Recoil Ion Mass Spectrometer Experiment (TRIMS)*
- Developed detector simulations with SRIM software to account for systemics
  - Analyzed and checked quality of data with C++ and Python scripts.
  - Validated analysis software (C++, Python). Currently writing a paper
- Visiting Researcher**, Max-Planck-Institut für Physik, Munich, Germany July 2018  
*Karlsruhe Tritium Neutrino Experiment*
- Collaborated to fit data and compare results obtained with different analysis approaches
- Visiting Researcher**, Karlsruhe Institute of Technology, Karlsruhe, Germany August 2018  
*Karlsruhe Tritium Neutrino experiment*
- Designed and tested ion detection measurements. Solved ion safety problems with ion team
- Undergraduate research**, Universidad Nacional Autónoma de México January 2015 - May 2016  
*High Altitude Water Cherenkov Experiment*
- Analyzed data produced by muons to monitor the experiment (C++, ROOT).

## SELECTED PAPERS

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### Published papers

1. Analysis methods for the first KATRIN neutrino-mass measurement  
The KATRIN Collaboration, accepted to Phys. Rev. D. (2021)
2. Bound on 3+1 active-sterile neutrino mixing from the first four-week science run of KATRIN  
The KATRIN Collaboration, Phys. Rev. Lett. 126, 091803 (2021)
3. Beta Decay of Molecular Tritium  
The TRIMS Collaboration, Phys. Rev. Lett. 124, 222502 (2020)
4. First operation of the KATRIN experiment with tritium  
The KATRIN Collaboration, Eur. Phys. J. C 80, 264 (2020)
5. An improved upper limit on the neutrino mass from a direct kinematic method by KATRIN  
The KATRIN Collaboration, Phys. Rev. Lett. 123, 221802 (2019)
6. Suppression of Penning discharges between the KATRIN spectrometers  
The KATRIN Collaboration, Eur. Phys. J. C 80 (2019) 9, 821
7. Gamma-induced background in the KATRIN main spectrometer  
The KATRIN Collaboration, Eur. Phys. J. C 79 (2019) 9, 807
8. Muon-induced background in the KATRIN main spectrometer  
The KATRIN Collaboration, Astroparticle Physics, Vol. 108, pp. 40-49 (2019)
9. Reduction of stored-particle background by a magnetic pulse method at the KATRIN experiment  
The KATRIN Collaboration, Eur. Phys. J. C, 78:778 (2018)
10. First transmission of electrons and ions through the KATRIN beamline  
The KATRIN Collaboration, JINST 13 P04020 (2018)

## GRANTS AND AWARDS

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- FGSA Under Represented Minorities Meeting Award 2021  
To attend the APS April meeting
- KSETA grant 2018  
For summer research at KIT, Karlsruhe, Germany
- Poster finalist 2018  
At the XXVIII International Conference on Neutrino Physics and Astrophysics
- Juan Manuel Lozano Mejía Diploma 2016  
Recognition for the excellent work in bachelor thesis
- Becario Internacional 2014  
Scholarship to study abroad for one semester given by UNAM-DGESI

## CONTRIBUTED TALKS AND POSTERS

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- *Talk:* Studies of background ions of the KATRIN experiment April 2021  
APS April Meeting (Virtual meeting)
- *Poster:* Ion monitoring with the KATRIN experiment June 2020  
XXIX International Conference on Neutrino Physics and Astrophysics (Virtual meeting)  
Co-authors: Fabian Friedel and Magnus Schlösser
- *Poster:* Ion retention, blocking and monitoring within the KATRIN experiment July 2019  
Heraeus Seminar (Bad Honnef, Germany)

- *Talk:* Ion retention, blocking and monitoring within the KATRIN experiment April 2019  
APS April Meeting (Denver, USA)
- *Poster:* Detecting light ions and electrons with TRIMS silicon detectors June 2018  
XXVIII International Conference on Neutrino Physics and Astrophysics (Heidelbergh, Germany)  
Co-author: Woo-Jeong Baek
- *Poster:* Monitoreo del Observatorio HAWC utilizando muones verticales October 2015  
Congreso Nacional de Física (Merida, México)

## TEACHING EXPERIENCE

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- *Teaching Assistant:* Experimental Physics and Basic Experimental Physics 2016 - 2017  
Department of Physics, Carnegie Mellon University. Professor: Barry Luokkala
- *Teaching Assistant:* Física Nuclear y Subnuclear 2015 - 2016  
Universidad Nacional Autónoma de México. Professor: Hermes León Vargas

## SERVICE

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- Panellist in *Underrepresented Minorities Roundtable* Jan 2020  
APS Conference for Undergraduate Women in Physics (CUWiP), Pittsburgh PA
- Chair of FGSA APS April meeting session April 2019  
Session name: *Publishing in Areas Outside of Peer Reviewed Journals*
- Panellist in APS April meeting *A Panel Discussion on Physics Graduate School* April 2019
- FGSA representative at the annual leadership convocation of APS. January 2019
- APS *Forum of Graduate Students Affairs* (FGSA) Treasurer 2018, 2019
- USA Organizer of *CAM 2019 conference* July 2019  
Canadian American Mexican graduate student physics conference
- Organizer of *Constructive Interference* meetings for women and minorities in science 2017, 2018  
at Carnegie Mellon University

## TECHNICAL SKILLS

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**Software:** Python, C++, ROOT, SRIM, and Mathematica

**OS:** Mac OSX, Windows, and Linux

**Language:** Spanish (native), English (fluent)

**Other:** Ultimate Frisbee