ANA PAULA VIZCAYA HERNANDEZ

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EDUCATION

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

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 fur 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 Autonoma de Mexico January 2015 - May 2016
High Altitude Water Cherenkov Experiment

- Analyzed data produced by muons to monitor the experiment (C++, ROOT).

SELECTED PAPERS

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

- 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

- *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

- *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

- 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

Software: Python, C++, ROOT, SRIM, and Mathematica
OS: Mac OSX, Windows, and Linux
Language: Spanish (native), English (fluent)
Other: Ultimate Frisbee