

JORGE TORRES

Yale University
Wright Lab
272 Whitney Ave, Room 254
New Haven, CT 06511, USA

Email: jorge.torreespinosa@yale.edu
Website: <https://toej93.github.io/>
ORCID: 0000-0003-4385-6127

EDUCATION

- The Ohio State University**, Columbus, Ohio USA May 2021
Ph.D. in Physics–Advisor: Prof. Amy Connolly
Master of Science in Physics, July 2017
- Universidad de Colima**, Colima, Mexico. August 2015
Bachelor of Science in Physics–Advisor: Alfredo Aranda

CURRENT POSITION

Yale University, New Haven, Connecticut USA **July 2021 –**
Postdoctoral Researcher, Neutrinoless double beta decay (CUORE/CUPID experiments) in Karsten Heeger’s/Reina Maruyama’s Lab.

PREVIOUS POSITIONS

The Ohio State University, Columbus, OH, USA **Fall 2015 – June 2021**
PhD Student, Ultra-High Energy Neutrino Astrophysics (Askaryan Radio Array, T-576 experiment)

SELECTED PUBLICATIONS

6. “With or without ν ? Hunting for the seed of the matter-antimatter asymmetry”
CUORE Collaboration
[arXiv:2404.04453].
5. “Snowmass Early Career”
Snowmass Early Career (SEC) organization
[arXiv:2210.12004].
4. “Constraints on the Diffuse Flux of Ultra-High Energy Neutrinos from Four Years of Askaryan Radio Array Data in Two Stations”
P. Allison *et. al.* (**co-author**)
Phys. Rev. D 102, 043021 (2020) [arXiv:1912.00987].
3. “Observation of Radar Echoes From High-Energy Particle Cascades”
S. Prohira *et. al.* (incl. **J. A. Torres**)
Phys Rev Lett. 2020 Mar 6;124(9):091101. [arXiv:1910.12830].
2. “NuRadioMC: Simulating the radio emission of neutrinos from interaction to detector”
C. Glaser *et. al.* (incl. **J. A. Torres**)
Eur.Phys.J. C80 (2020) no.2, 77. [arXiv:1906.01670].
1. “Suggestion of Coherent Radio Reflections from an Electron-Beam Induced Particle Cascade”
S.Prohira *et. al.* (incl. **J. A. Torres**)
Phys. Rev. D 100, 072003 (2019). [arXiv:1810.09914].

INVITED TALKS

10. Invited talk, Physics and Math Colloquium
Universidad de Colima, Mexico (remote). 2024/10/12
Towards the discovery of matter creation with the CUORE and CUPID experiments.

9. Invited talk, HEP seminar
University of Maryland, College Park, US. 2024/10/06
CUORE's latest results
8. Invited talk, 2024 Lake Louise Winter Institute
Banff, Alberta, Canada. 2024/02/22
Searching for $0\nu\beta\beta$ decay with CUPID
7. Invited talk, 6th Joint Meeting of the APS Division of Nuclear Physics and the Physical Society of Japan
Big Island, HI. 2023/12/01
Searching for $0\nu\beta\beta$ decay with CUORE and CUPID
6. Invited talk, HEP Seminar
Michigan State University, East Lansing, MI. 2022/11/08
Searching for $0\nu\beta\beta$ decay with CUORE... and beyond
5. Invited talk, Seminario de Altas Energías
UNAM, Mexico. 2022/05/25
Searching for $0\nu\beta\beta$ decay with CUORE
4. Invited talk, GAE (Grupo de Altas Energías) Seminar
CINVESTAV, Mexico. 2022/02/25
Searching for $0\nu\beta\beta$ decay with CUORE
3. Invited talk, Wright Lab WIDG Seminar
Wright Lab, Yale Physics Dept, New Haven CT, USA. 2021/10/26
Tuning into neutrinos on the radio with the ARA experiment
2. Invited plenary talk, XIX Mexican School of Particles and Fields
Held remotely due to COVID-19 2021/08/10
Tuning into neutrinos on the radio
1. Invited talk, UMASS Dartmouth Physics Department Colloquium
Held remotely due to Covid-19 pandemic. 2020/10/15
Tuning into neutrinos on the radio

CONTRIBUTED TALKS AND POSTERS

14. Poster, XXXI International Conference on Neutrino Physics and Astrophysics.
Milan, Italy. 2024/06/18
Reconstruction of muon events with CUORE.
13. Contributed talk, APS DNP Fall Meeting, New Orleans LA. 2022/10/28
CUPID: a next-generation $0\nu\beta\beta$ decay experiment
12. Poster, Seattle Snowmass Summer Meeting, Seattle WA. 2022/07/19
CUPID: a next-generation $0\nu\beta\beta$ decay experiment
11. Poster, Neutrino 2022, Seoul, Korea (Virtual). 2022/05/30
Mitigation of cosmic muon backgrounds for CUPID
10. Contributed talk, APS April Meeting, New York, NY. 2022/04/11
Design of a muon-veto system for the CUPID experiment
9. Contributed talk, APS April Meeting, held remotely due to COVID-19 2021/04/19
Reconstruction of UHE neutrinos with the Askaryan Radio Array (ARA) experiment
8. Poster, Cosmic Rays and Neutrinos in the Multi-Messenger Era
Held remotely due to Covid-19 pandemic. 2020/12/07
Recent results from the Askaryan Radio Array (ARA) experiment

7. Contributed talk, 2020 Graduate Student Summer Seminar Series, Columbus OH. 2020/06/30
Ultra-High Energy Neutrinos: Physics, detection, and recent results from the Askaryan Radio Array (ARA) experiment
6. Contributed talk, APS April Meeting, held remotely due to COVID-19 2020/04/19
Recent results from the Askaryan Radio Array (ARA) experiment
5. Contributed talk, Graduate Student Summer Seminar Series, Columbus OH. 2019/07/17
Ultra-High Energy Neutrinos: Physics and Detection
4. Contributed talk, Radio-Workshop, DESY (Zeuthen), Germany. 2019/06/19
Validation of in-ice simulations
3. Contributed talk, APS April Meeting, Denver CO. 2019/04/15
Simulations of radio-based Ultra-High Energy (UHE) in-ice neutrino experiments
2. Contributed talk, Ohio Supercomputer Center Statewide Users Group Conference, Columbus, OH. 2018/04/05
The role of HPC in the radio-detection of astrophysical neutrinos
1. Contributed talk, Computing in High Energy Astropart. Phys. Research 2016, Columbus OH. 2016/05/26
The BuckArray: detecting cosmic rays with cellphones

OUTREACH TALKS

10. Pint of Postdoc, by the Yale Postdoctoral Association
New Haven CT, USA. 2023/05/31
Neutrinos: the ghost-like particles
9. Union County Magnet High School
NJ, USA. 2023/05/05
Neutrinos: the ghost-like particles
8. Instituto Heisenberg
Universidad de Colima, Colima, Mexico. 2023/04/01
Neutrinos: las partículas cuasi-fantasmas
7. Snowmass Summer Study Physics Slam [**winner**]
University of Washington, Seattle, WA. 2022/07/21
Neutrinos: the ghost-like particles
6. Girls Advancing in STEM (GAINS) Conference
Yale University, New Haven, CT. 2022/04/08
Neutrinos: the ghost-like particles
5. Yale Science in the News talk (series: Hidden things)
Brookfield Library, Connecticut, USA. 2022/02/24
 ν 's from outer space, observing the Universe with neutrinos
4. Yale Science in the News talk (series: Hidden things)
SSILL, Connecticut, USA. 2022/02/23
 ν 's from outer space, observing the Universe with neutrinos
3. Yale Science in the News talk (series: Hidden things)
New Canaan Library, Connecticut, USA. 2022/02/17
 ν 's from outer space, observing the Universe with neutrinos
2. Yale Science in the News talk (series: Hidden things)
Brooklyn Public Library, New York, USA. 2022/02/15
 ν 's from outer space, observing the Universe with neutrinos

1. Talk (high school students), Instituto Heisenberg
Universidad de Colima, Colima, Mexico .
Stories from a physics PhD student in the US

2019/05/19

RELEVANT SKILLS

Programming/Software Languages	C++, C, Python, BASH, L ^A T _E X, Git, Geant4, ROOT Spanish (Native), English (Full professional proficiency)
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AWARDS

- Winner of the Snowmass Summer Study Physics Slam 07/2022
- Selected poster at the Hayes Research Forum 02/2020
My abstract was selected among two hundred other abstracts to participate in the research forum and present a poster on my work.
- APS Division of Astrophysics Travel Grant to attend the APS April Meeting 04/2019
My abstract was selected, and I was awarded \$600 (USD) to cover travel expenses for the APS April Meeting.
- Ohio SuperComputer Center Statewide Users Group Conference Talk Award 10/2017
I received this award for getting second place in their 5-minute talk competition.

TEACHING

Teaching Assistant, “Physics 1201:E&M, Optics and Quantum Mechanics”, OSU Spring 2018–Summer 2018	
Teaching Assistant, “Physics 1250: Mech, Thermo, Waves”, OSU	Fall 2015–Spring 2017

OUTREACH AND SERVICE

Yale Nuclear, Particle and Astrophysics (NPA) seminar coordinator	Aug 2024 – Jan 2025
Panelist at “How to prepare for scientific conferences” workshop at Wright Lab	July 10, 2024
Organizer of New Haven Pint of Science	May 13-15, 2024
Volunteer for the 2024 Yale Physics Olympics	March 30, 2024
Member of Postdoctoral Advisory Committee at Yale’s Physics Department	Nov, 2023 –
Panelist at “How to prepare for scientific conferences” workshop at Wright Lab	July 18, 2023
Executive member of the 2023 Yale Physics Olympics	April, 2023
Mentor at the APS DNP Conference Experience for Undergraduates	October, 2022
Postdoc representative for the Yale Physics Club Committee	October, 2022 – October 2023
Yale Science In The News (SITN) Director	September, 2022 – August, 2023
Project lead for Yale Pathways to Science	July 13th, 2022
Speaker at Girls Advancing in STEM (GAINS) Conference	April 8th, 2022
Organizer of “Big Questions in Particle Physics” Snowmass Colloquia	October 2021 – June 2022
Member of the Snowmass Early Career Core Initiatives Leadership	September 2021 – August 2022
Creator and organizer of the <i>Elusives Journal Club</i> at Yale Wright Lab	August 2021 – January 2023
Delegate, Council of Graduate Students (CGS), OSU	August 2019–August 2020
Volunteer for “Friends of Ohio State Astronomy and Astrophysics” (FOSAA) event	October 2019
Volunteer for Breakfast of Science Champions, OSU	November 2019
Volunteer Poster Judge, Ohio Supercomputer Center	April 2018–August 2020
Counsel member for the Society for Women in Physics (SWiP), OSU	August 2017–December 2018
Coordinator for ASPIRE Workshop for High School Girls, OSU	July 2017–July 2020

MENTORSHIP

At Yale:

- Graduate Students:** Ridge Liu, Maya Moore, Samantha Pagan, Iris Ponce, Emily Pottebaum, Ruoxi Wang (student at Johns Hopkins University).
- Undergraduate Students:** Iffat Zarif, Aaron Chizhik, Din-Ammar Tolj, Andrew Hutchison (student at MIT), Jackie Hua, Andrew Zheng, Reagan Garcia (summer student from CalPoly).

At Ohio State:

- Graduate Students:** Dennis Calderon-Madera, Julie Rolla, Justin Flaherty, Dylan Frikken
- Undergraduate Students:** Ian Best, Hannah Hassan, Alex Machtay, Alex Patton

SOFTWARE PROJECTS

- Lobster Plot: Code to make the so-called “Lobster Plot”, developed from code that previous Yale grad. student Jeremy Cushman wrote. Website: <https://toej93.github.io/LobsterPlot/>.

Full publication list (without proceedings)

- [1] D. Q. Adams et al. “Data-driven background model for the CUORE experiment”. In: *Phys. Rev. D* 110.5 (2024), p. 052003. DOI: 10.1103/PhysRevD.110.052003. arXiv: 2405.17937 [nucl-ex].
- [0] D. Q. Adams et al. “Search for Fractionally Charged Particles with CUORE”. In: *Phys. Rev. Lett.* 133 (24 Dec. 2024), p. 241801. DOI: 10.1103/PhysRevLett.133.241801. URL: <https://link.aps.org/doi/10.1103/PhysRevLett.133.241801>.
- [3] CUORE Collaboration et al. *With or without ν ? Hunting for the seed of the matter-antimatter asymmetry*. 2024. arXiv: 2404.04453 [nucl-ex]. URL: <https://arxiv.org/abs/2404.04453>.
- [4] B. Acharya et al. “Fundamental Symmetries, Neutrons, and Neutrinos (FSNN): Whitepaper for the 2023 NSAC Long Range Plan”. In: (Apr. 2023). arXiv: 2304.03451 [nucl-ex].
- [5] J. A. Aguilar et al. “Trieboelectric backgrounds to radio-based polar ultra-high energy neutrino (UHEN) experiments”. In: *Astropart. Phys.* 145 (2023), p. 102790. DOI: 10.1016/j.astropartphys.2022.102790.
- [6] K. Alfonso et al. “A first test of CUPID prototypal light detectors with NTD-Ge sensors in a pulse-tube cryostat”. In: *JINST* 18.06 (2023), P06033. DOI: 10.1088/1748-0221/18/06/P06033. arXiv: 2304.04674 [physics.ins-det].
- [7] K. Alfonso et al. “Twelve-crystal prototype of Li_2MoO_4 scintillating bolometers for CUPID and CROSS experiments”. In: *JINST* 18.06 (2023), P06018. DOI: 10.1088/1748-0221/18/06/P06018. arXiv: 2304.04611 [physics.ins-det].
- [8] J. A. Aguilar et al. “In situ, broadband measurement of the radio frequency attenuation length at Summit Station, Greenland”. In: (Jan. 2022). DOI: 10.1017/jog.2022.40. arXiv: 2201.07846 [astro-ph.IM].
- [9] J. A. Aguilar et al. “Reconstructing the neutrino energy for in-ice radio detectors: A study for the Radio Neutrino Observatory Greenland (RNO-G)”. In: *Eur. Phys. J. C* 82.2 (2022), p. 147. DOI: 10.1140/epjc/s10052-022-10034-4. arXiv: 2107.02604 [astro-ph.HE].
- [10] K. Alfonso et al. “Optimization of the first CUPID detector module”. In: *Eur. Phys. J. C* 82.9 (2022), p. 810. DOI: 10.1140/epjc/s10052-022-10720-3. arXiv: 2202.06279 [physics.ins-det].
- [11] P. Allison et al. “Low-threshold ultrahigh-energy neutrino search with the Askaryan Radio Array”. In: *Phys. Rev. D* 105.12 (2022), p. 122006. DOI: 10.1103/PhysRevD.105.122006. arXiv: 2202.07080 [astro-ph.HE].
- [12] Joshua Barrow et al. “Snowmass Early Career: The Key Initiatives Organization”. In: *Snowmass 2021*. July 2022. arXiv: 2207.07508 [physics.soc-ph].
- [13] J. A. Aguilar et al. “Design and Sensitivity of the Radio Neutrino Observatory in Greenland (RNO-G)”. In: *JINST* 16.03 (2021). [Erratum: *JINST* 18, E03001 (2023)], P03025. DOI: 10.1088/1748-0221/16/03/P03025. arXiv: 2010.12279 [astro-ph.IM].

- [14] J. A. Aguilar et al. “Triboelectric Backgrounds to radio-based UHE Neutrino Experiments”. In: (Mar. 2021). arXiv: 2103.06079 [astro-ph.IM].
- [15] S. Prohira et al. “Modeling in-ice radio propagation with parabolic equation methods”. In: *Phys. Rev. D* 103.10 (2021), p. 103007. DOI: 10.1103/PhysRevD.103.103007. arXiv: 2011.05997 [astro-ph.IM].
- [16] S. Prohira et al. “The Radar Echo Telescope for Cosmic Rays: Pathfinder experiment for a next-generation neutrino observatory”. In: *Phys. Rev. D* 104.10 (2021), p. 102006. DOI: 10.1103/PhysRevD.104.102006. arXiv: 2104.00459 [astro-ph.IM].
- [17] M.G. Aartsen et al. “IceCube-Gen2: The Window to the Extreme Universe”. In: (Aug. 2020). arXiv: 2008.04323 [astro-ph.HE].
- [18] P. Allison and others [co-author]. “Constraints on the diffuse flux of ultrahigh energy neutrinos from four years of Askaryan Radio Array data in two stations”. In: *Phys. Rev. D* 102.4 (2020), p. 043021. DOI: 10.1103/PhysRevD.102.043021. arXiv: 1912.00987 [astro-ph.HE].
- [19] Christian Glaser et al. “NuRadioMC: Simulating the radio emission of neutrinos from interaction to detector”. In: *Eur. Phys. J. C* 80.2 (2020), p. 77. DOI: 10.1140/epjc/s10052-020-7612-8. arXiv: 1906.01670 [astro-ph.IM].
- [20] S. Prohira et al. “Observation of Radar Echoes From High-Energy Particle Cascades”. In: *Phys. Rev. Lett.* 124.9 (2020), p. 091101. DOI: 10.1103/PhysRevLett.124.091101. arXiv: 1910.12830 [astro-ph.HE].
- [21] M. G. Aartsen et al. “Neutrino astronomy with the next generation IceCube Neutrino Observatory”. In: (Nov. 2019). arXiv: 1911.02561 [astro-ph.HE].
- [22] J.A. Aguilar et al. “The Next-Generation Radio Neutrino Observatory – Multi-Messenger Neutrino Astrophysics at Extreme Energies”. In: (July 2019). arXiv: 1907.12526 [astro-ph.HE].
- [23] P. Allison et al. “Long-baseline horizontal radio-frequency transmission through polar ice”. In: *arXiv e-prints*, arXiv:1908.10689 (Aug. 2019), arXiv:1908.10689. arXiv: 1908.10689 [astro-ph.IM].
- [24] S. Prohira et al. “Suggestion of Coherent Radio Reflections from an Electron-Beam Induced Particle Cascade”. In: *Phys. Rev. D* 100.7 (2019), p. 072003. DOI: 10.1103/PhysRevD.100.072003. arXiv: 1810.09914 [hep-ex].