

Mauricio Bustamante

Contact information

Niels Bohr Institute	mbustamante@nbi.ku.dk
University of Copenhagen	Mobile: +45 22 23 05 66 (preferred)
Blegdamsvej 17	Office: +45 35 33 47 78
Copenhagen 2100, Denmark	http://mbustamante.net

Citizenship – Peru (born in Lima)	ORCID: 0000-0001-6923-0865
-----------------------------------	----------------------------

INSPIRE HEP statistics — h-index: 35 / Total citations: 4451 / Citations/paper (avg.): 44.5

Research interests

Astroparticle physics, neutrino physics, ultra-high-energy astrophysical neutrinos and cosmic rays, gamma-ray bursts, new physics in ultra-high-energy phenomena

Employment

Assistant Professor, Niels Bohr Institute, U. of Copenhagen	2020–Present
Postdoctoral Researcher, Niels Bohr Institute, U. of Copenhagen	2017–2020
Postdoctoral Fellow, Center for Cosmology and AstroParticle Physics, Ohio State U.	2014–2017

Education

Ph.D., Physics, Julius-Maximilians-Universität Würzburg, Germany	2014
Also: Graduate Assistant in the Astroparticle Theory group, DESY Zeuthen, Germany	
M.S., Physics, Pontificia Universidad Católica del Perú, Peru	2010
B.Sc., Physics, Pontificia Universidad Católica del Perú, Peru	2006

Projects funded

- | | |
|---|-----------|
| 1. Villum Fonden Young Investigator Award
“Pushing neutrino physics to the cosmic frontier”
(Project no. 29388)
Amount: ~1.3M euro
Role: Principal investigator | 2020–2026 |
| 2. Fermi Guest Investigator Program — Cycle 12
“Correlating Fermi-LAT and ASAS-SN data to understand blazars”
(GSFC #121122, NSPIRES #18-FERMI12-0026)
Role: Co-investigator | 2019–2020 |

Awards and distinctions

Ohio State U. Annual International Scholar Research Exposition	2016
KITP Fellowship “Present and future neutrino physics”, UC Santa Barbara	2014
DFG Research Training Group GRK1147 “Theoretical astrophysics and particle physics”, U. Würzburg, Germany	2012–2014
Program for Latin American Students, Fermilab Theory Department	2009
M.Sc. thesis project awarded 2009 Prize for Research Support of Graduate Students, PUCP, Peru	2009
CERN High Energy Latinamerican-European Network (HELEN) STT Fellow, IFIC, Spain	2008
CERN High Energy Latinamerican-European Network (HELEN) CT Fellow, CINVESTAV, Mexico	2007–2008
CERN High Energy Latinamerican-European Network (HELEN) CT Fellow, CINVESTAV, Mexico	2006–2007

Supervising experience

Postdocs

1. Damiano Fiorillo (Niels Bohr Institute, U. of Copenhagen) 2022–2024
Now: Humboldt Fellow at DESY Zeuthen

PhD students

2. Bernanda Telalovic (Niels Bohr Institute, U. of Copenhagen) 2022–
“Pushing neutrino physics to the cosmic frontier”
1. Víctor B. Valera (Niels Bohr Institute, U. of Copenhagen) 2020–2024
“The particle physics discovery potential in the ultra-high-energy neutrino era”

MSc students

9. Yifei Li (Niels Bohr Institute, U. of Copenhagen) 2025–
“Measuring the diffuse flux of ultra-high-energy neutrinos in GRAND”
8. Aske Bernth Matthiesen (Niels Bohr Institute, U. of Copenhagen) 2025–
“Flavor measurements in TAMBO”
7. Johannes vos Jacobsen (Niels Bohr Institute, U. of Copenhagen) 2024–
“Decay of heavy dark matter inside Earth into ultra-high-energy neutrinos”
6. Andreas Knage (Niels Bohr Institute, U. of Copenhagen) 2024–2025
Co-supervisor: Damiano Fiorillo
“Probing dark matter using high-energy neutrinos from NGC 1068”
5. Federico Testagrossa (University of Padova) 2023–2024
Co-supervisors: Elisa Bernardini (U. Padova), Damiano Fiorillo
“Measurement forecasts of the ultra-high-energy neutrino flavor composition: unlocking new insights into astrophysics and fundamental physics”
4. Anirudh Bhatnagar (Niels Bohr Institute, U. of Copenhagen) 2022–2023
“Probing quantum-gravity decoherence using high-energy neutrinos from NGC 1068”
3. Marie Cornelius (Niels Bohr Institute, U. of Copenhagen) 2021–2022
“Probing axions with high-energy cosmic neutrinos”
2. Kjartan Másson (Niels Bohr Institute, U. of Copenhagen) 2020–2021
“Secret interactions of ultra-high-energy neutrinos in next-generation detectors”
1. Charlotte Rosenstrøm (Niels Bohr Institute, U. of Copenhagen) 2018–2020
Co-supervisor: Irene Tamborra
“Secret interactions of high-energy astrophysical neutrinos”

BSc students

6. Asmus Bo Klingemann (Niels Bohr Institute, U. of Copenhagen) 2025
“Neutrino tomography of Earth in ESSnuSB”
5. Julie Harder Gabrielsen (Niels Bohr Institute, U. of Copenhagen) 2024–2025
“A Method to Compute Neutrino Oscillation Probabilities for Arbitrary Time-Dependent Hamiltonians”
4. Franciszek Nawrocki (Niels Bohr Institute, U. of Copenhagen) 2023–2024
Co-supervisor: Bernanda Telalovic
“Investigating Neutrino Oscillations at Astrophysical Energy Scales”
3. Jonathan Baltazar Steensgaard (Niels Bohr Institute, U. of Copenhagen) 2021
“New Limits on the Neutrino Lifetime Using the Flavour Composition of High-Energy Astrophysical Neutrinos”

- | | |
|--|------|
| 2. Niels Gustav Nortvig Wilesen (Niels Bohr Institute, U. of Copenhagen) | 2020 |
| Co-supervisor: Markus Ahlers | |
| “Flavours of astrophysical neutrinos in active-sterile mixing” | |
| 1. Siqiao Mu (Caltech, SURF Program visitor at NBI) | 2018 |
| Co-supervisor: Markus Ahlers | |
| “Unitarity Bounds of Astrophysical Neutrinos” | |

Short-term visiting students

- | | |
|--|------|
| 5. Selim Aydoğdu (BSc, Bilkent University) | 2025 |
| 4. Dyer Cárdenas (BSc, Pontificia Universidad Católica del Perú, REPU Program) | 2025 |
| 3. Rasmi Hajjar (PhD, IFIC University of Valencia) | 2024 |
| 2. Nisanur Aysu Arat (BSc, Istanbul Technical University, Erasmus+ Mobility) | 2022 |
| 1. Beyda Altunbaş (BSc, Istanbul Technical University, Erasmus+ Mobility) | 2021 |

Experimental collaborations

- | | |
|--|-------|
| TAMBO (Tau Air Shower Mountain-Based Observatory) | 2020– |
| <i>Role:</i> Founding member. Planning the science case, design, and deployment of this proposed detector in the Peruvian Andes. | |
| POEMMA (Probe of Extreme Multi-Messenger Astrophysics) | 2020– |
| <i>Role:</i> Help build up the science case at ultra-high neutrino energies of this twin-satellite neutrino and cosmic-ray detector. Contributor to the white paper. | |
| IceCube-Gen2 | 2019– |
| <i>Role:</i> Associate member. Help build up the science case at ultra-high neutrino energies by producing detailed projections of astrophysical and fundamental-physics measurements. Contributor to IceCube-Gen2 white paper and Technical Design Report. (icecube.wisc.edu) | |
| GRAND (Giant Radio Array for Neutrino Detection) | 2015– |
| <i>Role:</i> Member of the Board of the experiment, chair of the Publications Committee. In charge of writing Collaboration policy on internal and external dissemination of data and results. Editor of the white paper proposing the experiment. (grand.cnrs.fr/) | |

Participation in international community planning exercises

- | | |
|--|------|
| 2021-22 High-Energy Physics Community Planning Exercise (Snowmass 2021) | 2021 |
| <i>Role:</i> The exercise charts the course of research and investment in particle physics in the US and internationally. Contributed several letters of interest and edited several white papers on high-energy neutrinos, co-authored with leading neutrino researchers. | |
| European Consortium for Astroparticle Theory (EuCAPT) Theory White Paper | 2021 |
| <i>Role:</i> Contributed to the white paper laying out opportunities and challenges in theoretical astroparticle physics in the next decade. | |
| Decadal Survey on Astronomy and Astrophysics 2020 (Astro2020) | 2020 |
| <i>Role:</i> The survey charts the course of research and investment in astronomy and astrophysics. Contributed and edited two white papers on high-energy neutrinos, co-authored with theorists and experimentalists, on astrophysics and fundamental physics. | |

Community service tasks

Grant proposal reviewer for the Deutsche Forschungsgemeinschaft (DFG), Germany; National Science Center, Poland; Dutch Research Council, The Netherlands; Chilean Antarctic Institute, Chile.

Referee for multiple high-impact journals, including Physical Review Letters, Physical Review D, European Physical Journal C, Journal of High-Energy Physics, Journal of Cosmology and Astroparticle Physics, and The Astrophysical Journal.

International Advisory Committee

International Workshop on Weak Interactions and Neutrinos (WIN 2025)	2025
--	------

Convener

TeV Particle Astrophysics (TeVPA 2025), Valencia, Spain	2025
39th International Cosmic Ray Conference (ICRC 2025), Geneva, Switzerland	2025
32nd International Symposium on Lepton Photon Interactions at High Energies (Lepton-Photon 2025), Madison, WI, USA	2025

Organization of scientific events

IV NBIA International PhD School: “Here, There & Everywhere”, Copenhagen, Denmark Organizer	2025
III NBIA International PhD School: “Here, There & Everywhere”, Copenhagen, Denmark Organizer	2023
II NBIA International PhD School: “Here, There & Everywhere”, Copenhagen, Denmark Organizer	2022
I NBIA International PhD School: “Here, There & Everywhere” (online) Organizer	2021
GRAND Collaboration Workshop, Nijmegen, The Netherlands Co-organizer	2018
TeVPA 2017, Columbus, OH Co-chair of the local organizing committee	2017
GRAND Collaboration Workshop, Paris, France Co-organizer	2017
CCAPP Weekly Seminars Organizer	2015–2016
CCAPP Workshop “Making sense of the ultra-high-energy sky” Chair and organizer; brought together experts on theory and experiment in UHE cosmic rays, gamma rays, and neutrinos	2015
I Peruvian School on High-Energy Physics and Cosmology (EPFAEC 2015) Member of the organizing committee	2015
Physics Colloquia at PUCP, Lima, Peru Founder; organized 200+ colloquia so far; tasks include selecting and contacting speakers, logistics, and advertising	2011–2021

Teaching experience

Invited lectures , EuCAPT Astroneutrino Theory Workshop, Prague, Czech Republic “Introduction to multi-messenger astrophysics”	2024
Invited lectures , Mainz Institute Theoretical Physics (MITP) Summer School “Crosslinks of Early Universe Cosmology”, Mainz, Germany “Introduction to multi-messenger astrophysics”	2024

Invited lectures , Invisible 2023 School, Bad Honnef, Germany	2023
“Perspectives in multi-messenger astrophysics”	
Invited lectures , Mexican Astro-Particle School (MAPS) (online)	2021
“High-energy and ultra-high-energy cosmic neutrinos”	
Videos: Lecture 1 — youtu.be/77siO6wTsjg ; Lecture 2 — https://youtu.be/HlYHMaJFc-I	
Invited lecture , HIRSAP PhD School and Workshop, Karlsruhe, Germany	2019
“High-Energy Cosmic Neutrinos: Where Do We Stand, Where Do We Go, and How Do We Get There”	
Teaching assistant, Elementary Particles, PUCP, Peru	2007–2008
Teaching assistant, Quantum Mechanics I, PUCP, Peru	2007
Teaching assistant, Modern Physics, PUCP, Peru	2007
Teaching assistant, General Physics 3 (Basic Electromagnetism), PUCP, Peru	2006–2007
Teaching assistant, Computational Physics, PUCP, Peru	2006
Teaching assistant, Introduction to Computing, PUCP, Peru	2006

Refereed journal publications

-
47. TAMBO Collaboration, *TAMBO: a deep-valley neutrino observatory*, arXiv:2507.08070
 46. B. Telalovic, **M. Bustamante**, *No Flavor Anisotropy in the High-Energy Neutrino Sky Upholds Lorentz Invariance*, arXiv:2503.15468
 45. L. S. Schumacher, **M. Bustamante**, M. Agostini, F. Oikonomou, E. Resconi, *Beyond first light: global monitoring for high-energy neutrino astronomy*, arXiv:2503.07549
 44. **M. Bustamante**, J. Ellis, R. Konoplich, A. S. Sakharov, *Probing Lorentz invariance with a high-energy neutrino flare*, PRD 111, 12 (2025) [arXiv:2408.15949]
 43. GRAND Collaboration, *GRANDlib: A simulation pipeline for the Giant Radio Array for Neutrino Detection (GRAND)*, Comput. Phys. Commun. 308, 109461 (2025) [arXiv:2408.10926]
 42. B. Telalovic, D. F. G. Fiorillo, P. Martínez-Miravé, E. Vitagliano, **M. Bustamante**, *The next galactic supernova can uncover mass and couplings of particles decaying to neutrinos*, JCAP 11, 011 (2024) [arXiv:2406.15506]
 41. V. B. Valera, D. F. G. Fiorillo, I. Esteban, **M. Bustamante**, *New limits on neutrino decay from high-energy astrophysical neutrinos*, PRD 110, 043004 (2024) [arXiv:2405.14826]
 40. S. K. Agarwalla, **M. Bustamante**, M. Singh, P. Swain, *A plethora of long-range neutrino interactions probed by DUNE and T2HK*, JHEP 09, 055 (2024) [arXiv:2404.02775]
 39. A. Coleman, O. Ericsson, C. Glaser, **M. Bustamante**, *Flavor composition of ultrahigh-energy cosmic neutrinos: Measurement forecasts for in-ice radio-based EeV neutrino telescopes*, PRD 110, 023044 (2024) [arXiv:2402.02432] [Selected as APS Editors’ Suggestion](#)
 38. **M. Bustamante**, *The Milky Way shines in high-energy neutrinos*, Nature Rev. Phys. 6, 8 (2024) [arXiv:2312.08102]
 37. Q. Liu, D. F. G. Fiorillo, C. A. Argüelles, **M. Bustamante**, N. Song, *Identifying Energy-Dependent Flavor Transitions in High-Energy Astrophysical Neutrino Measurements*, PRD 112, 043019 (2025) [arXiv:2312.07649]
 36. B. Telalovic, **M. Bustamante**, *Flavor Anisotropy in the High-Energy Astrophysical Neutrino Sky*, [arXiv:2310.15224]
 35. F. Testagrossa, D. F. G. Fiorillo, **M. Bustamante**, *Two-detector flavor sensitivity to ultra-high-energy cosmic neutrinos* [arXiv:2310.12215]
 34. V. B. Valera, **M. Bustamante**, O. Mena, *Joint measurement of the ultra-high-energy neutrino spectrum and cross section* [arXiv:2308.07709]

33. D. F. G. Fiorillo, V. B. Valera, **M. Bustamante**, W. Winter, *Searches for dark matter decay with ultra-high-energy neutrinos endure backgrounds*, PRD 108, 10 (2023) [arXiv:2307.02538]
32. M. Singh, **M. Bustamante**, S. K. Agarwalla, *Flavor-dependent long-range neutrino interactions in DUNE & T2HK: alone they constrain, together they discover*, JHEP 08, 101 (2023) [arXiv:2305.05184]
31. S. K. Agarwalla, **M. Bustamante**, S. Das, A. Narang, *Present and future constraints on flavor-dependent long-range interactions of high-energy astrophysical neutrinos*, JHEP 08, 113 (2023) [arXiv:2305.03675]
30. D. F. G. Fiorillo, **M. Bustamante**, *Bump hunting in the diffuse flux of high-energy cosmic neutrinos*, PRD 107, 083008 (2023) [arXiv:2301.00024]
29. V. B. Valera, **M. Bustamante**, C. Glaser *Near-future discovery of the diffuse flux of ultrahigh-energy cosmic neutrinos*, PRD 107, 043019 (2023)[arXiv:2210.03756]
28. D. F. G. Fiorillo, **M. Bustamante**, V. B. Valera, *Near-future discovery of point sources of ultra-high-energy neutrinos*, JCAP 03, 026 (2023)[arXiv:2205.15985]
27. V. B. Valera, **M. Bustamante**, C. Glaser, *The ultra-high-energy neutrino-nucleon cross section: measurement forecasts for an era of cosmic EeV-neutrino discovery*, JHEP 06, 105 (2022) [arXiv:2204.04237]
26. N. Song, S. W. Li, C. A. Argüelles, **M. Bustamante**, A. C. Vincent, *The Future of High-Energy Astrophysical Neutrino Flavor Measurements*, JCAP 04, 054 (2021) [arXiv:2012.12893] [INSPIRE 50+](#)
25. M. Ahlers, **M. Bustamante**, N. G. Nørtvig Wilesen, *Flavors of astrophysical neutrinos with active-sterile neutrinos*, JCAP 07, 029 (2021) [arXiv:2009.01253]
24. **M. Bustamante**, I. Tamborra, *Using high-energy neutrinos as cosmic magnetometers*, PRD 102, 123008 (2020) [arXiv:2009.01306]
23. **M. Bustamante**, *New limits on neutrino decay from the Glashow resonance of high-energy cosmic neutrinos*, [arXiv:2004.06844]
22. **M. Bustamante**, C. Rosenstrøm, S. Shalgar, I. Tamborra, *Bounds on secret neutrino interactions from high-energy astrophysical neutrinos*, PRD 101, 123024 (2020) [arXiv:2001.04994] [INSPIRE 50+](#)
21. S. Shalgar, I. Tamborra, **M. Bustamante**, *Core-collapse supernovae stymie secret neutrino interactions*, PRD 103, 123008 (2021) [arXiv:1912.09115] [INSPIRE 50+](#)
20. **M. Bustamante**, *NuOscProbExact: a general-purpose code to compute exact two-flavor and three-flavor neutrino oscillation probabilities*, [arXiv:1904.12391]
19. **M. Bustamante**, M. Ahlers, *Inferring the Flavor of High-Energy Astrophysical Neutrinos at Their Sources*, PRL 122, 241101 (2019) [arXiv:1901.10087] [INSPIRE 50+](#)
18. M. Ahlers, **M. Bustamante**, S. Mu, *Unitarity Bounds of Astrophysical Neutrinos*, PRD 98, 123023 (2018) [arXiv:1810.00893]
17. **M. Bustamante**, S. K. Agarwalla, *A Universe's Worth of Electrons to Probe Long-Range Interactions of High-Energy Astrophysical Neutrinos*, PRL 122, 061103 (2019) [arXiv:1808.02042] [INSPIRE 50+](#) [Selected as APS Editors' Suggestion](#)
16. **M. Bustamante**, A. Connolly, *Extracting the Energy-Dependent Neutrino-Nucleon Cross Section Above 10 TeV Using IceCube Showers*, PRL 122, 041101 (2019) [arXiv:1711.11043] [INSPIRE 100+](#)
15. **M. Bustamante**, K. Murase, J.F. Beacom, *Testing Decay of Astrophysical Neutrinos with Incomplete Information*, PRD 95, 063013 (2017) [arXiv:1610.02096] [INSPIRE 100+](#)
14. S. W. Li, **M. Bustamante**, J. F. Beacom, *Echo Technique to Distinguish Flavors of Astrophysical Neutrinos*, PRL 122, 151101 (2019) [arXiv:1606.06290] [INSPIRE 50+](#)

13. **M. Bustamante**, J. Heinze, K. Murase, W. Winter, *Multi-messenger light curves from gamma-ray bursts in the internal shock model*, ApJ 837, 33 (2017) [arXiv:1606.02325] [INSPIRE 50+](#)
12. J. Heinze, D. Boncioli, **M. Bustamante**, W. Winter, *Cosmogenic Neutrinos Challenge the Cosmic Ray Proton Dip Model*, ApJ 825, 122 (2016) [arXiv:1512.05988] [INSPIRE 50+](#)
11. ARA Collaboration, D. Guetta, **M. Bustamante**, *Constraints on the Ultra-High Energy Neutrino Flux from Gamma-Ray Bursts from a Prototype Station of the Askaryan Radio Array*, Astropart. Phys. 88, 7 (2017) [arXiv:1507.00100]
10. **M. Bustamante**, J. F. Beacom, W. Winter, *Theoretically palatable flavor combinations of astrophysical neutrinos*, PRL 115, 161302 (2015) [arXiv:1506.02645] [INSPIRE 100+](#)
9. **M. Bustamante**, P. Baerwald, K. Murase, W. Winter, *Neutrino and cosmic-ray emission from multiple internal shocks in gamma-ray bursts*, Nature Commun. 6, 6783 (2015) [arXiv:1409.2874] [INSPIRE 50+](#)
8. P. Baerwald, **M. Bustamante**, W. Winter, *Are gamma-ray bursts the sources of ultra-high energy cosmic rays?*, Astropart. Phys. 62, 66 (2015) [arXiv:1401.1820] [INSPIRE 50+](#)
7. P. Baerwald, **M. Bustamante**, W. Winter, *UHECR escape mechanisms for protons and neutrons from GRBs, and the cosmic ray-neutrino connection*, ApJ 768, 186 (2013) [arXiv:1301.6163] [INSPIRE 50+](#)
6. P. Baerwald, **M. Bustamante**, W. Winter, *Neutrino Decays over Cosmological Distances and the Implications for Neutrino Telescopes*, JCAP 1210, 020 (2012) [arXiv:1208.4600] [INSPIRE 100+](#)
5. C. A. Argüelles, **M. Bustamante**, A. M. Gago, *Searching for cavities of various densities in the Earth's crust with a low-energy $\bar{\nu}_e$ β -beam*, Mod. Phys. Lett. A 30, 1550146 (2015) [arXiv:1201.6080]
4. **M. Bustamante**, A. M. Gago, J. Jones-Perez, *SUSY Renormalization Group Effects in Ultra High Energy Neutrinos*, JHEP 1105, 133 (2011) [arXiv:1012.2728]
3. C. A. Argüelles, **M. Bustamante**, A. M. Gago, *IceCube expectations for two high-energy neutrino production models at active galactic nuclei*, JCAP 1012, 005 (2010) [arXiv:1008.1396]
2. **M. Bustamante**, A. M. Gago, C. Pena-Garay, *Energy-independent new physics in the flavour ratios of high-energy astrophysical neutrinos*, JHEP 1004, 066 (2010) [arXiv:1001.4878] [INSPIRE 50+](#)
1. J. L. Bazo, **M. Bustamante**, A. M. Gago, O. G. Miranda, *High energy astrophysical neutrino flux and modified dispersion relations*, Int. J. Mod. Phys. A 24, 55819 (2009) [arXiv:0907.1979]

Reviews, white papers, and lectures

17. C. A. Argüelles *et al.*, *Snowmass White Paper: Beyond the Standard Model effects on Neutrino Flavor*, Eur. Phys. J. C 83, 15 (2023) [arXiv:2203.10811] [INSPIRE 50+](#)
16. M. Ackermann *et al.*, *High-Energy and Ultra-High-Energy Neutrinos*, JHEAp 36, 55 (2022) [arXiv:2203.08096] [INSPIRE 100+](#)
15. R. M. Abraham *et al.*, *Tau Neutrinos in the Next Decade: from GeV to EeV*, J. Phys. G 49, 110501 (2022) [arXiv:2203.05591] [INSPIRE 50+](#)
14. J. M. Berryman *et al.*, *Neutrino Self-Interactions: A White Paper*, Phys. Dark Univ. 42, 101267 (2023) [arXiv:2203.01955] [INSPIRE 100+](#)
13. R. Alves Batista *et al.*, *EuCAPT White Paper: Opportunities and Challenges for Theoretical Astroparticle Physics in the Next Decade*, [arXiv:2110.10074] [INSPIRE 50+](#)
12. A. V. Olinto *et al.*, *The POEMMA (Probe of Extreme Multi-Messenger Astrophysics) Observatory*, JCAP 06, 007 (2021) [arXiv:2012.07945] [INSPIRE 100+](#)

11. A. V. Olinto *et al.*, *Snowmass 2021 Letter of Interest: The Probe Of Multi-Messenger Astrophysics (POEMMA)*, [arXiv:2008.13047]
10. IceCube-Gen2 Collaboration, *IceCube-Gen2; The window to the extreme Universe*, J. Phys. G 48, 060501 (2021) [arXiv:2008.04323] [INSPIRE 500+](#)
9. A. Romero-Wolf *et al.*, *An Andean Deep-Valley Detector for High-Energy Tau Neutrinos*, White paper prepared for the Latin American Strategy Forum for Research Infrastructure [arXiv:2002.06475] [INSPIRE 50+](#)
8. D. Grant *et al.*, *Neutrino astronomy with the next generation IceCube Neutrino Observatory*, APC white paper prepared for the US Astro2020 Decadal Survey (2019) [arXiv:1911.02561] [INSPIRE 50+](#)
7. M. Mostafá *et al.*, *Science and Design for the Giant Radio Array for Neutrino Detection*, APC white paper prepared for the US Astro2020 Decadal Survey (2019)
6. A. Olinto *et al.*, *POEMMA: Probe of Extreme Multi-Messenger Astrophysics*, APC white paper prepared for the US Astro2020 Decadal Survey (2019) [arXiv:1907.06217]
5. R. Alves-Batista, J. Biteau, **M. Bustamante** *et al.*, *Open Questions in Cosmic-Ray Research at Ultrahigh Energies*, Front. Astron. Space Sci. 6, 23 (2019) [arXiv:1903.06714] [INSPIRE 250+](#)
4. M. Ackermann, M. Ahlers, L. Anchordoqui, **M. Bustamante** *et al.*, *Astrophysics Uniquely Enabled by Observations of High-Energy Cosmic Neutrinos*, White paper prepared for the US Astro2020 Decadal Survey, Bull. Am. Astron. Soc. 51, 185 (2019) [arXiv:1903.04334] [INSPIRE 50+](#)
3. M. Ackermann, M. Ahlers, L. Anchordoqui, **M. Bustamante** *et al.* (corresponding author), *Fundamental Physics with High-Energy Cosmic Neutrinos*, White paper prepared for the US Astro2020 Decadal Survey, Bull. Am. Astron. Soc. 51, 215 (2019) [arXiv:1903.04333] [INSPIRE 50+](#)
2. GRAND Collaboration (**M. Bustamante** editor and contributor), *The Giant Radio Array for Neutrino Detection (GRAND): Science and Design*, Sci. China-Phys. Mech. Astron. 63, 219501 (2020) [arXiv:1810.09994] [INSPIRE 250+](#)
1. **M. Bustamante**, L. Cieri, J. Ellis, *Beyond the Standard Model for Montaneros*, CERN Yellow Report CERN-2010-001, 1455 (2010) [arXiv:0911.4409]

Conference proceedings

33. GRAND Collaboration, *The Giant Radio Array for Neutrino Detection (GRAND) Collaboration – Contributions to the 39th International Cosmic Ray Conference (ICRC 2025)*, [arXiv:2507.09585]
32. J. Lavoisier, X. Tian, K. Kotera, T. Sako, H. Wang, **M. Bustamante** (for the GRAND Collaboration), *Search for cosmic rays in GRANDProto300*, Proceedings of the 39th International Cosmic Ray Conference (ICRC 2025) [arXiv:2507.06695]
31. M. Guelfand, P. Fritsch, V. Decoene, O. Martineau-Huynh, **M. Bustamante** (for the GRAND Collaboration), *Reconstruction of inclined cosmic-ray properties with GRAND data*, Proceedings of the 39th International Cosmic Ray Conference (ICRC 2025) [arXiv:2507.04324]
30. S. K. Agarwalla, **M. Bustamante**, M. Singh, *A plethora of long-range neutrino interactions probed by DUNE and T2HK*, Proceedings of the 25th International Workshop on Neutrinos from Accelerators (NuFact2024) [arXiv:2501.14835]
29. S. K. Agarwalla, **M. Bustamante**, S. Das, A. Narang, *Constraints on flavor-dependent long-range interactions of high-energy astrophysical neutrinos*, Proceedings of the 25th International Workshop on Neutrinos from Accelerators (NuFact2024) [arXiv:2501.12662]

28. M. Singh, **M. Bustamante**, S. K. Agarwalla, *Flavor-Dependent Long-Range Neutrino Interactions in DUNE and T2HK: Synergy Breeds Power*, Proceedings of the 25th International Workshop on Neutrinos from Accelerators (NuFact2024) [arXiv:2501.12171]
27. GRAND Collaboration, *The Giant Radio Array for Neutrino Detection (GRAND) Collaboration – Contributions to the 10th International Workshop on Acoustic and Radio EeV Neutrino Detection Activities (ARENA 2024)*, [arXiv:2409.03427]
26. GRAND Collaboration, *The Giant Radio Array for Neutrino Detection (GRAND) Collaboration – Contributions to the 38th International Cosmic Ray Conference (ICRC 2023)*, [arXiv:2308.00120]
25. W. Thompson (for the TAMBO Collaboration), *TAMBO: Searching for Tau Neutrinos in the Peruvian Andes*, Proceedings of the 38th International Cosmic Ray Conference (ICRC 2023), PoS ICRC2023, 1109 (2023)
24. V. B. Valera, D. F. G. Fiorillo, I. Esteban, **M. Bustamante**, *Probing Neutrino Decay Using the First Steady-State Source of High-Energy Astrophysical Neutrinos, NGC 1068*, Proceedings of the 38th International Cosmic Ray Conference (ICRC 2023), PoS ICRC2023, 1066 (2023)
23. D. F. G. Fiorillo, **M. Bustamante**, *Near-future discovery of point sources of ultra-high-energy neutrinos*, Proceedings of the 38th International Cosmic Ray Conference (ICRC 2023), PoS ICRC2023, 1000 (2023)
22. C. A. Argüelles, **M. Bustamante**, D. F. G. Fiorillo, Q. Liu, N. Song, A. Vincent, *Energy-dependent flavor ratios of High-energy Astrophysical Neutrinos*, Proceedings of the 38th International Cosmic Ray Conference (ICRC 2023), PoS ICRC2023, 1182 (2023)
21. V. B. Valera, **M. Bustamante**, C. Glaser, *Comprehensive Measurement Forecasts of the EeV Neutrino-Nucleon Cross Section with Cosmic Neutrinos at IceCube-Gen2*, Proceedings of the 38th International Cosmic Ray Conference (ICRC 2023), PoS ICRC2023, 1063 (2023) [arXiv:2307.11050]
20. V. B. Valera, **M. Bustamante**, C. Glaser, *Discovery Forecasts of the Diffuse Ultra-High-Energy Neutrino Flux with IceCube-Gen2*, Proceedings of the 38th International Cosmic Ray Conference (ICRC 2023), PoS ICRC2023, 1065 (2023) [arXiv:2307.11055]
19. D. F. G. Fiorillo, **M. Bustamante**, *Hunting for bumps in the diffuse high-energy neutrino flux*, Proceedings of the 38th International Cosmic Ray Conference (ICRC 2023), PoS ICRC2023, 999 (2023) [arXiv:2307.09170]
18. D. F. G. Fiorillo, **M. Bustamante**, V. B. Valera, *Point sources of ultra-high-energy neutrinos: minimalist predictions for near-future discovery*, Proceedings of the 21st International Symposium on Very High Energy Cosmic Ray Interactions (ISVHECRI 2022), arXiv:2207.11940
17. L. J. Schumacher, M. Huber, M. Agostini, **M. Bustamante**, F. Oikonomou, *PLEνM: A global and distributed monitoring system of high-energy astrophysical neutrinos*, Proceedings of the 37th International Cosmic Ray Conference (ICRC 2021), PoS ICRC2021, 1185 (2021) [arXiv:2107.13534]
16. V. B. Valera, **M. Bustamante**, *Reaching the EeV frontier in neutrino-nucleon cross sections in upcoming neutrino telescopes*, Proceedings of the 37th International Cosmic Ray Conference (ICRC 2021), PoS ICRC2021, 1200 (2021)
15. N. Song, S. W. Li, C. A. Argüelles, **M. Bustamante**, A. C. Vincent, *The Future of High-Energy Astrophysical Neutrino Flavor Measurements*, Proceedings of the 37th International Cosmic Ray Conference (ICRC 2021), PoS ICRC2021, 1178 (2021)
14. V. Van Elewyck, **M. Bustamante**, et al., *GeV–TeV Neutrino Spectra from Proton-Proton Interactions in Astrophysical Environments*, Proceedings of the 36th International Cosmic Ray Conference (ICRC 2019), PoS ICRC2019, 1023 (2019)
13. C. Argüelles, **M. Bustamante**, et al., *Fundamental physics with high-energy cosmic neutrinos today and in the future*, Proceedings of the 36th International Cosmic Ray Conference (ICRC 2019), PoS ICRC2019, 849 (2019) [arXiv:1907.08690]

12. A. Olinto, **M. Bustamante**, *et al.*, *The POEMMA (Probe of Extreme Multi-Messenger Astrophysics) mission*, Proceedings of the 36th International Cosmic Ray Conference (ICRC 2019), PoS ICRC2019, 378 (2019) [arXiv:1909.09466]
11. **M. Bustamante**, *Pushing the Energy and Cosmic Frontiers with High-Energy Astrophysical Neutrinos*, Proceedings of the 6th Symposium on Prospects in the Physics of Discrete Symmetries (DISCRETE 2018), [arXiv:1904.01595]
10. K. Fang, **M. Bustamante**, *et al.*, *The Giant Radio Array for Neutrino Detection (GRAND): Present and Perspectives*, Proceedings of the 35th International Cosmic Ray Conference (ICRC 2017), PoS ICRC2017, 996 (2018) [arXiv:1708.05128]
9. Q. Gou, **M. Bustamante**, *et al.*, *The GRANDproto35 Experiment*, Proceedings of the 35th International Cosmic Ray Conference (ICRC 2017), PoS ICRC2017, 388 (2018)
8. A. Olinto, **M. Bustamante**, *et al.*, *POEMMA: Probe Of Extreme Multi-Messenger Astrophysics*, Proceedings of the 35th International Cosmic Ray Conference (ICRC 2017), PoS ICRC2017, 542 (2018) [arXiv:1708.07599] [INSPIRE 50+](#)
7. J. Heinze, D. Boncioli, **M. Bustamante**, W. Winter *Cosmogenic Neutrinos Challenge the Cosmic Ray Proton Dip Model*, Proceedings of the 35th International Cosmic Ray Conference (ICRC 2017), PoS ICRC2017, 589 (2018)
6. O. Martineau-Huynh, **M. Bustamante**, W. Carvalho, *et al.*, *The Giant Radio Array for Neutrino Detection*, Proceedings of the 7th international workshop on Acoustic and Radio EeV Neutrino Detection Activities (ARENA 2016), EPJ Web Conf. 135, 02001 (2017) [arXiv:1702.01395]
5. O. Martineau-Huynh, K. Kotera, **M. Bustamante**, *et al.*, *The Giant Radio Array for Neutrino Detection*, Proceedings of the 7th Very Large Volume Neutrino Telescope Workshop (VLvNT155), EPJ Web Conf. 116, 03005 (2016) [arXiv:1508.01919]
4. **M. Bustamante**, P. Baerwald, W. Winter, *UHE neutrino and cosmic ray emission from GRBs: revising the models and clarifying the cosmic ray-neutrino connection*, Proceedings of the 6th Very Large Volume Neutrino Telescope Workshop (VLvNT13), AIP Conf. Proc. 1630, 78 (2014) [arXiv:1402.1497]
3. **M. Bustamante**, P. Baerwald, W. Winter, *Escape and propagation of UHECR protons and neutrons from GRBs, and the cosmic ray-neutrino connection*, Proceedings of the 33rd International Cosmic Ray Conference (ICRC 2013), Braz. J. Phys. 44, 415 (2014) [arXiv:1306.2755]
2. **M. Bustamante**, A.M. Gago, J.L. Bazo, O.G. Miranda, *Extreme scenarios of new physics in the UHE astrophysical neutrino flavour ratios*, Proceedings of DISCRETE08, J. Phys. Conf. Ser. 171, 012048 (2009) [arXiv:0906.5329]
1. **M. Bustamante**, A.M. Gago, J.L. Bazo, O.G. Miranda, *On the sensitivity of neutrino telescopes to a modified dispersion relation*, Proceedings of the 11th Mexican Workshop on Particles and Fields (MWPF 2007), AIP Conf. Proc. 1026, 251 (2008)

Scientific presentations, colloquia, seminars, lectures

Note: Slides are available at mbustamante.net/talks/.

- | | |
|--|------|
| 161. Invited talk , 26th International Workshop on Neutrinos from Accelerators (NuFact 2025), Liverpool, UK
“Beyond PMNS with astrophysical neutrinos” | 2025 |
| 160. Invited talk , 19th International Conference on Topics in Astroparticle and Underground Physics (TAUP 2025), Xichang, China
“A theory overview of high-energy cosmic neutrinos” | 2025 |
| 159. Invited talk , Neutrino rapporteur talk at the 39th International Cosmic Ray Conference (ICRC 2025), Geneva Switzerland
“ICRC 2025 Neutrino Rapporteur” | 2025 |

158. **Talk**, 39th International Cosmic Ray Conference (ICRC 2025), Geneva Switzerland 2025
“A Global Strategy for the Future of High-Energy Neutrino Astronomy”
157. **Invited talk**, ECAP Seminar, Erlangen Center for Astroparticle Physics, Germany 2025
“Fundamental physics with high-energy and ultra-high-energy cosmic neutrinos”
156. **Invited talk**, Science Coffee Lund University 2025
“Neutrino physics at the cosmic and energy frontiers”
155. **Invited talk**, 3rd Town Hall KM3NeT Meeting 2025
Les Houches, France
“Beyond-the-Standard-Model physics from KM3-230213A and beyond”
154. **Invited talk**, FestiGago 2025
Pontificia Universidad Católica del Perú, Lima, Perú
“High-energy cosmic neutrinos for particle physics and astrophysics”
153. **Invited talk**, NBIA Junior Colloquium 2025
Niels Bohr Institute, Denmark
“Higher, further, faster: high-energy cosmic neutrinos for particle physics and astrophysics”
152. **Invited talk**, Spåtind 2025 — 28th Nordic Conference on Particle Physics, 2025
Skeikampen, Norway
“Introduction to multi-messenger astrophysics”
151. **Invited talk**, GRAPPA Colloquium, University of Amsterdam, The Netherlands 2024
“High-energy neutrino physics from high-energy astrophysical neutrinos”
150. **Invited talk**, 8th Shanghai Symposium on Particle Physics and Cosmology: 2024
Cosmic Neutrinos, Multi-messengers and Innovative Detectors,
Tsung-Dao Lee Institute, Shanghai, China
“Where do high-energy astrophysical neutrinos come from?”
149. **Invited talk**, Partikeldagarna — Meeting of the Particle- and Astroparticle Physics 2024
section of the Swedish Physical Society, Stockholm University, Sweden
“High-energy cosmic neutrinos in particle physics and astrophysics: present and future”
148. **Invited talk**, University College London Workshop on Multimessenger Astronomy 2024
London, UK
“High-energy neutrino physics & astrophysics”
147. **Invited talk**, 13th Cosmic-Ray International Studies and Multi-messenger 2024
Astroparticle Conference (CRIS-MAC), Trapani, Italy
“Tau neutrinos from GeV to EeV”
146. **Invited talk**, 1st Nordic Meeting on Neutrino and Radio Astronomy, 2024
Chalmers University, Gothenburg, Sweden
“The future of (high-energy) neutrino astronomy”
145. **Invited talk**, N3AS Seminar (online) 2024
“The present and future of flavor in high-energy cosmic neutrinos”
144. **Invited talk**, Astroparticle Physics Seminar, DESY, Zeuthen, Germany 2024
“The flavor composition of high-energy cosmic neutrinos: towards high statistics and ultra-high energies”
143. **Invited talk**, GAPP Seminar, Pennsylvania State University, State College, USA 2024
“Neutrino physics at the cosmic and energy frontiers”
142. **Invited talk**, NPAC Seminar, University of Wisconsin Madison, USA 2024
“The flavor composition of high-energy cosmic neutrinos: towards high statistics and ultra-high energies”
141. **Invited talk**, Fermilab Neutrino Seminar Series 2024
“Neutrino physics at the cosmic and energy frontiers”
140. **Astro Tuesday**, Kavli Institute for Cosmological Physics, University of Chicago 2024
“Neutrino-matter interactions: going cosmic to reach higher energies”

139. **Invited talk**, Iranian Conference on High Energy Physics 1402 (IRCHEP 1402, online) 2024
“Neutrino physics at the cosmic and energy frontiers”
138. **Invited talk**, XX International Workshop on Neutrino Telescopes, Venice, Italy 2023
“New physics from high-energy cosmic messengers”
137. **Invited talk**, Quantum gravity phenomenology in the multi-messenger approach, Rijeka, Croatia 2023
“New physics from high-energy cosmic messengers”
136. **Invited talk**, Seminar Queen Mary University of London, London, UK 2023
“Higher, further, faster: neutrino physics at the cosmic and energy frontiers”
135. **Invited talk**, Institut 'Astrophysique de Paris (IAP) colloquium, Paris, France 2023
“Astrophysics and particle physics with high-energy cosmic neutrinos *today and in the future*”
134. **Invited talk**, Seminar Uppsala University, Uppsala, Sweden 2023
“Neutrino physics at the highest energies today and in the future”
133. **Invited talk**, Oskar Klein Center colloquium, Stockholm, Sweden 2023
“Higher, further, faster: neutrino physics at the cosmic and energy frontiers”
132. **Invited talk**, Seminar Max Planck Institute for Nuclear Physics, Heidelberg, Germany 2023
“Neutrino physics at the highest energies today and in the future”
131. **Invited talk**, Neutrinos in the Multi-Messenger Era, UC Louvain, Louvain, Belgium 2022
“New physics with high-energy astrophysical neutrinos”
130. **Invited talk**, Seminar PUCP, Lima, Peru 2022
“Neutrino physics and astrophysics at the highest energies”
129. **Invited talk**, XIV Latin American Symposium of High-Energy Physics, Quito, Ecuador 2022
“Astrophysics and fundamental physics from high-energy cosmic messengers”
128. **Invited talk**, TAMBO touch-base workshop (online) 2022
“New astronomy with high-energy neutrinos”
127. **Invited talk**, Snowmass Community Summer Study (online) 2022
“High-energy and ultra-high-energy neutrinos whitepaper”
126. **Invited talk**, Invisibles 2022 Workshop, University Paris-Saclay, France 2022
“New physics with high-energy neutrinos”
125. **Invited talk**, NBI Section 9 Mini-Conference, NBI, Copenhagen, Denmark 2022
“High-energy neutrino physics”
124. **Invited talk**, NPAC Seminar, University of Wisconsin Madison (online) 2022
“Measuring the UHE neutrino-nucleon cross section in IceCube-Gen2”
123. **Invited talk**, IceCube Spring Collaboration Meeting, Brussels, Belgium 2022
“IceCube-Gen2: Particle Physics Perspectives and Recent Results”
122. **Invited talk**, Snowmass Neutrino Physics Frontier Workshop (online) 2022
“Connections: Cosmic Frontier”
121. **Invited talk**, CINVESTAV Physics Colloquium (online) 2022
“Neutrino physics at the highest energies today and in the future”
120. **Invited talk**, Synergies@Prague, Prague, Czech Republic 2021
“Fundamental physics with high-energy and ultra-high-energy neutrinos”
Video: youtu.be/P2YaEhx90Ek
119. **Invited talk**, Carleton University Physics Colloquium (online) 2021
“Neutrino physics and astrophysics at the highest energies”
118. **Invited talk**, Seminar Instituto de Física, Universidad Nacional de México (online) 2021
“Neutrino physics at the highest energies today and in the future”
117. **Invited talk**, Paris-Saclay Astroparticle Symposium 2021, University Paris-Saclay 2021
“Grounded tests of neutrino physics with high- and ultra-high-energy cosmic neutrinos”

116. **Invited talk**, Sinapsis 2021 (online) 2021
“Pushing Neutrino Physics to the Cosmic Frontier”
115. **Invited talk**, IceCube-Gen2 Workshop / Technical Design Report Kickoff (online) 2021
“UHE neutrino science with IceCube-Gen2”
114. **Invited talk**, CERN Theory Colloquium (online) 2021
“Pushing high-energy neutrino physics to the cosmic frontier”
Video: cds.cern.ch/record/2784018
113. **Invited talk**, NuTau 2021 workshop (online) 2021
“High-energy and ultra-high-energy tau neutrinos and BSM”
112. **Talk**, European Physical Society Conference on High Energy Physics (EPS-HEP 2021) (online) 2021
“The future of high-energy astrophysical neutrino flavor measurements”
111. **Invited talk**, 29th JEM-EUSO International Collaboration Meeting (online) 2021
“Secret interactions of UHE neutrinos with POEMMA”
110. **Invited talk**, 1st EuCAPT Annual Symposium (online) 2021
“High-energy and ultra-high-energy cosmic neutrinos: great today, better tomorrow”
Video: cds.cern.ch/record/2766430
109. **Invited talk**, Astroparticle Physics Seminar, Max Planck Institute for Physics (online) 2021
“Astrophysics and particle physics with high-energy cosmic neutrinos today and in the future”
108. **Invited talk**, Thursday Morning Science, University of L’Aquila (online) 2021
“The exceptional life and times of the neutrino”
Video: youtu.be/kPKAbLHb6FQ
107. **Invited talk**, III Encuentro Científico Internacional de Exalumnos de Física UNSAAC (ENCEFIS) (online) 2021
“High-energy cosmic neutrinos: a window into particle physics and astrophysics”
Video: youtu.be/tH6uVJ_cee8
106. **Invited talk**, Cosmic Rays and Neutrinos in the Multi-Messenger Era (online) 2020
“Flavor composition of high-energy neutrinos”
105. **Invited talk**, 28th JEM-EUSO Collaboration Meeting (online) 2020
“Physics beyond the Standard Model with POEMMA”
104. **Invited talk**, Michigan State University, USA (online) 2020
“Astrophysics and particle physics with high-energy cosmic neutrinos today and in the future”
103. **Invited talk**, UNICAMP, Brazil (online) 2020
“Neutrino Physics with High-Energy Cosmic Neutrinos”
Video: youtu.be/uqXRfTSxbs
102. **Poster**, Neutrino 2020 (online) 2020
“Bounds on Secret Interactions from High-Energy Astrophysical Neutrinos”
101. **Poster**, Neutrino 2020 (online) 2020
“New Limits on Neutrino Decay from the Glashow Resonance of High-Energy Cosmic Neutrinos”
100. **Invited talk**, King’s College, UK (online) 2020
“Pushing Neutrino Physics to the Cosmic Frontier”
99. **Invited talk**, Multimessengers @ Prague Workshop, Czech Republic 2019
“Fundamental Physics with High-Energy Cosmic Neutrinos”
98. **Invited talk**, TTK Theory Seminar, RWTH Aachen University, Germany 2019
“Pushing Neutrino Physics to the Cosmic Frontier”
97. **Invited talk**, CERN Neutrino Platform Week 2019: Hot Topics in Neutrino Physics, CERN, Switzerland 2019
“High-Energy Cosmic Neutrinos: Current Status and Future Prospects”

96. **Invited talk**, 4th Uppsala workshop on Particle Physics with Neutrino Telescopes (PPNT19), Uppsala, Sweden 2019
“The Flavor of High-Energy Cosmic Neutrinos as a Tool for Particle Physics and Astrophysics”
95. **Invited talk**, Perspectives in Astroparticle physics from High Energy Neutrinos (PAHEN), Berlin, Germany 2019
“Flavor in High-Energy Cosmic Neutrinos: Interpretation and New Challenges”
94. **Talk**, Cosmic Physics Center, Fermilab, USA 2019
“Pushing Neutrino Physics to the Cosmic Frontier”
93. **Talk**, 36th International Cosmic Ray Conference (ICRC), Madison, WI, USA 2019
“Fundamental Physics with High-Energy Astrophysical Neutrinos Today and in the Future”
92. **Poster**, 36th International Cosmic Ray Conference (ICRC), Madison, WI, USA 2019
“Flavor Probes the Production of High-Energy Astrophysical Neutrinos”
91. **Invited talk**, Particle and Astroparticle Theory Seminar, Max Planck Institute for Nuclear Physics, Heidelberg, Germany 2019
“Fundamental Physics with High-Energy Cosmic Neutrinos”
90. **Invited talk**, DARK Transient Tuesdays, DARK, Denmark 2019
“Gamma-ray bursts: a high-energy multi-messenger view”
89. **Invited talk**, DESY Astroparticle Seminar, DESY, Germany 2018
“Pushing the Energy and Cosmic Frontiers of Particle Physics with High-Energy Astrophysical Neutrinos”
88. **Invited talk**, DISCRETE 2018, Vienna, Austria 2018
“Pushing the Energy and Cosmic Frontiers of Particle Physics with High-Energy Astrophysical Neutrinos”
87. **Invited talk**, Nuclear and Particle Physics Seminar, Uppsala U., Sweden 2018
“Pushing the Energy and Cosmic Frontiers of Particle Physics with High-Energy Astrophysical Neutrinos”
86. **Talk**, TeVPA 2018, Berlin, Germany 2018
“Bounds on Ultra-Long-Range Flavored Neutrino Interactions with IceCube”
85. **Poster**, TeVPA 2018, Berlin, Germany 2018
“GRAND: The Giant Radio Array for Neutrino Detection”
84. **Invited talk**, GRAND Collaboration Workshop, Paris, France 2018
“Fundamental Neutrino Physics at Ultra-High Energies in GRAND”
83. **Invited talk**, 30th Rencontres de Blois, France 2018
“Neutrino Properties from Observations in Particle Physics”
82. **Invited talk**, Advanced Workshop on Physics of Atmospheric Neutrinos (PANE), Abdus Salam ICTP, Trieste, Italy 2018
“Measurement of Multi-TeV Neutrino Cross Section Via Earth Absorption”
81. **Invited talk**, 20th International Symposium on Very High Energy Cosmic Ray Interactions (ISVHECRI), Nagoya, Japan 2018
“Neutrinos from Ultra-High-Energy Cosmic Rays”
80. **Invited talk**, GRAPPA, Amsterdam, The Netherlands 2018
“Distilling fundamental high-energy neutrino physics from the sky”
79. **Talk**, “The High-Energy Universe: Gamma-ray, Neutrino, and Cosmic-Ray Astronomy” Program, Munich Institute for Astro- and Particle Physics (MIAPP), Munich 2018
“Prompt GRB neutrinos from multiple in-jet collisions”
78. **Invited talk**, “The High-Energy Universe: Gamma-ray, Neutrino, and Cosmic-Ray Astronomy” Program, Munich Institute for Astro- and Particle Physics (MIAPP), Munich 2018
“Heaven-sent high-energy fundamental neutrino physics”
77. **Colloquium**, Virginia Tech 2018
“The wondrous life and times of high-energy astrophysical neutrinos”

76. **Invited talk**, HEP Seminar, University College London 2017
“Heaven-sent neutrino interactions from TeV to PeV”
75. **Talk**, NBI N-Talk, Niels Bohr Institute 2017
“Heaven-sent high-energy neutrino interactions”
74. **Talk**, GRAPPA@5, Amsterdam, The Netherlands 2017
“ ν Interactions from the Heavens: Measuring Neutrino Cross Sections Above 10 TeV”
73. **Talk**, TeVPA 2017, Columbus, OH 2017
“High-energy neutrino interactions: first cross section measurements at TeV and above”
72. **Talk**, CCAPP Summer Seminar Series, Ohio State U. 2017
“A first measurement of high-energy neutrino cross sections with astrophysical neutrinos”
71. **Invited talk**, NEUCOS Workshop, DESY, Germany 2017
“New Physics Tests with High-Energy Astrophysical Neutrinos”
70. **Invited talk**, Interuniversity Institute for High Energies ULB-VLB, Brussels, Belgium 2017
“High-energy neutrinos, cosmic rays, and gamma rays from GRBs”
69. **Invited talk**, Laboratoire Astroparticule & Cosmologie (APC), Paris 2017
“High-energy neutrinos, cosmic rays, and gamma rays from GRBs”
68. **Invited talk**, IceCube Particle Astrophysics Symposium (IPA 2017), WIPAC, Madison, WI 2017
“High-energy neutrinos, cosmic rays, and gamma rays from GRBs”
67. **Invited talk**, IceCube Collaboration Meeting, WIPAC, Madison, WI 2017
“Laying Siege to New Physics in High-Energy Astrophysical Neutrinos”
66. **Invited talk**, LHC Results Forum 2017
“Overview of recent IceCube results”
65. **Invited talk**, Particle Astrophysics Seminar, Case Western Reserve University, OH 2017
“Prospecting for new physics with high-energy astrophysical neutrinos”
64. **Invited talk**, Astrophysics Seminar, Purdue University, IN 2017
“High-energy neutrinos, cosmic rays, and gamma rays from gamma-ray bursts”
63. **Invited talk**, Joint Particle Seminar, University of California, Irvine, CA 2017
“High-energy astrophysical neutrinos: testing ground for new physics”
62. **Invited talk**, Workshop “High-energy neutrino and cosmic-ray astrophysics – The way forward”, Weizmann Institute of Science, Rehovot, Israel 2017
“Tasting high-energy astrophysical neutrinos”
61. **Invited talk**, Astroparticle Physics @ Yachay, Yachay Tech, Ecuador 2016
“An overview of astrophysical neutrinos; theoretical aspects”
60. **Talk**, 8th Huntsville Gamma-Ray Burst Symposium, Huntsville, AL 2016
“Multi-messenger light curves from gamma-ray bursts”
59. **Talk**, TeVPA 2016, Geneva, Switzerland 2016
“Multi-messenger light curves from gamma-ray bursts”
58. **Poster**, TeVPA 2016, Geneva, Switzerland 2016
“Searching for new physics in the flavor composition of high-energy astrophysical neutrinos”
57. **Invited talk**, WIPAC, Madison, WI 2016
“Discovering ultra-high-energy neutrinos with GRAND, the Giant Radio Array for Neutrino Detection”
56. **Invited talk**, WIPAC, Madison, WI 2016
“High-energy astrophysical neutrinos: testing ground for new physics”
55. **Talk**, CCAPP Summer Seminar Series, Ohio State U. 2016
“Probing neutrino lifetime using high-energy astrophysical neutrinos”
54. **Invited talk**, The National Space Science & Technology Center, Huntsville, AL 2016
“Multi-messenger light curves from gamma-ray bursts”

53. **Invited talk**, Multi-Messenger Approaches to Cosmic Rays: Origins and Space Frontiers (MACROS 2016), Pennsylvania State U. 2016
“Gamma-ray bursts as UHECR sources”
52. **Invited talk**, DESY Astroparticle Seminar, DESY, Germany 2016
“High-energy astrophysical neutrinos: testing ground for new physics”
51. **Invited talk**, Niels Bohr Institute, Denmark 2016
“New physics in high-energy astrophysical neutrinos”
50. **Invited talk**, Lab. de Physique Nucléaire et de Hautes Énergies (LPNHE), France 2016
“High-energy astrophysical neutrinos: where do we stand, where do we go?”
49. **Invited talk**, GReCO Seminar, Institut d’Astrophysique de Paris (IAP), France 2016
“High-energy astrophysical neutrinos: probes of new physics”
48. **Invited talk**, Workshop on Perspectives on the Extragalactic Frontier: From Astrophysics to Fundamental Physics, ICTP, Trieste, Italy 2016
“Multi-messenger source models: the neutrino-UHECR connection”
47. **Invited talk**, APS April Meeting, Salt Lake City, UT 2016
“Tests of new physics with (high-energy) astrophysical neutrinos”
46. **Invited talk**, Seminar Center for Neutrino Physics, Virginia Tech 2016
“Probing neutrino lifetime using high-energy astrophysical neutrinos”
45. **Invited talk**, Next-Generation Techniques for UHE Astroparticle Physics (UHEAP), KICP, Chicago, IL 2016
“Flavor composition of high-energy astrophysical neutrinos: present and future”
44. **Talk**, 1st Pheno in Indiana, Kentucky, Illinois, and Ohio (PIKIO), U. Cincinnati 2016
“Decay of high-energy astrophysical neutrinos: present and near future”
43. **Invited talk**, Very High Energy Particle Astronomy (VHEPA 2016), Honolulu, HI 2016
“Discovering ultra-high-energy neutrinos with GRAND, The Giant Radio Array for Neutrino Detection”
42. **Invited talk**, GRAND Mini-workshop, KICP, Chicago, IL 2015
“Gamma-ray bursts: high-energy neutrino predictions in the IceCube era”
41. **Invited talk**, HEP Seminar, Pennsylvania State U. 2015
“Gamma-ray bursts: high-energy neutrino predictions in the IceCube era”
40. **Invited talk**, ICEHAP Seminar, Chiba U., Japan 2015
“Rethinking GRBs as sources of high-energy neutrinos”
39. **Invited talk**, TeVPA 2015, Tokyo, Japan 2015
“The landscape of flavor composition of high-energy astrophysical neutrinos”
38. **Invited talk**, HEP Seminar, Fermilab 2015
“Theoretically tasting the flavor composition of high-energy astrophysical neutrinos”
37. **Invited talk**, HEP Seminar, U. Cincinnati 2015
“What to expect for the flavor composition of high-energy astrophysical neutrinos”
36. **Talk**, “Crossroads of Neutrino Physics” Program, Mainz Institute for Theoretical Physics, Mainz, Germany 2015
“Revealing the flavor composition of astrophysical neutrinos: interplay of theory and experiment”
35. **Talk**, Nu@Fermilab Workshop, Fermilab 2015
“Flavor in high-energy astrophysical neutrinos”
34. **Talk**, “Neutrino Astrophysics and Fundamental Properties” Program (INT-15-21), Institute for Nuclear Theory, Seattle, WA 2015
“Recent results on the theoretical expectations of the flavor composition of astrophysical neutrinos”
33. **Talk**, CCAPP Summer Seminar Series, Ohio State U. 2015
“Honing in on the flavour composition of high-energy astrophysical neutrinos: the view from theory”

32. Talk, IceCube Particle Astrophysics Symposium (IPA 2015), WIPAC, Madison, WI 2015
“Ultra-high-energy emission from an evolving gamma-ray burst: neutrinos, cosmic rays, and gamma rays”
31. **Invited talk**, Latin American Webinars on Physics 2015
“Gamma-ray bursts: sources of ultra-high-energy cosmic rays and neutrinos”
Video: youtu.be/K5tJaJvB5Lo
30. **Invited talk**, IV Int. Workshop Math., Phys., and App., U. Nacional Callao, Peru 2015
“Gamma rays, cosmic rays and neutrinos: windows into the ultra-energetic Universe”
29. **Invited talk**, II Meeting on Theoretical Physics, U. Nacional Callao, Peru 2015
“Ultra-high energy neutrinos and cosmic rays from gamma-ray bursts”
28. Talk, “Present and Future Neutrino Physics” Program, KITP, Santa Barbara, CA 2014
“Neutrino decays over cosmological distances: GRBs”
Video: online.kitp.ucsb.edu/online/neutrinos14/bustamante/rm/flashtv.html
27. Talk, Seminar Series “Recent Results in Astroparticle Physics”, DESY, Germany 2014
“A dynamical GRB fireball model: new gamma-ray, cosmic-ray, and neutrino predictions”
26. Talk, Research Training Group GRK1147, U. Würzburg, Germany 2014
“Ultra-high-energy cosmic rays and neutrinos from gamma-ray bursts: new predictions for a new era”
25. Talk, Astroparticle Physics / TeVPA 2014, Amsterdam, The Netherlands 2014
“A revised view of the ultra-high energy cosmic ray-neutrino connection: the case of gamma-ray bursts”
24. Talk, Gamma-ray Bursts in the Multi-Messenger Era Workshop, Paris, France 2014
“Improved ultra-high energy cosmic ray and neutrino predictions from gamma-ray bursts”
23. **Invited talk**, IFIC Seminars, IFIC, Spain 2014
“Revisiting the cosmic ray-neutrino connection in gamma-ray bursts”
22. Talk, Astroparticle Physics Group, Uppsala U., Sweden 2014
“Ultra-high energy cosmic rays and neutrinos: revising the predictions and clarifying the connection”
21. **Invited talk**, Physics Colloquium, PUCP, Peru 2014
“Ultra-high-energy astrophysical cosmic rays and neutrinos: a half-century mystery”
Video: educast.pucp.edu.pe/video/3252/
20. Talk, Research Training Group GRK1147, U. Würzburg, Germany 2013
“An introduction to nuclear astrophysics”
19. Talk, Cosmology Lunch, Princeton U., Princeton, NJ 2013
“Gamma-ray bursts: revised prediction for ultra-high-energy neutrinos and cosmic rays”
18. Talk, Astro Coffee Blackboard Talk, IAS, Princeton, NJ 2013
“Decay of astrophysical neutrinos”
17. Talk, CCAPP Astroparticle Lunch, Ohio State U., Columbus, OH 2013
“Revised predictions of ultra-high-energy neutrinos from gamma-ray bursts and the cosmic ray-neutrino connection”
16. Talk, 6th Very Large Volume Neutrino Telescope Workshop, Stockholm, Sweden 2013
“UHE neutrino and cosmic ray emission from GRBs: revising the models and clarifying the cosmic ray-neutrino connection”
15. Talk, 33rd International Cosmic Ray Conference (ICRC), Rio de Janeiro, Brazil 2013
“Escape and propagation of UHECR protons and neutrons from GRBs, and the cosmic ray-neutrino connection”
14. Talk, 77th Annual Meeting of the Deutsches Physik. Gesellschaft, Dresden, Germany 2013
“Decay of neutrinos from cosmological sources and prospects of observation at neutrino telescopes”
13. Talk, Helmholtz Alliance for Astroparticle Physics Code Retreat, Zeuthen, Germany 2012
“Efficient computation of photohadronic interactions — an application to UHECR propagation and cosmogenic neutrinos”

12. Talk, Research Training Group GRK1147, U. Würzburg, Germany 2012
“The inert Higgs doublet model”
11. **Invited talk**, Two-day course, I Physics Summer School, U. Nacional Callao, Peru 2011
“An introduction to particle physics”
10. **Invited talk**, II Symposium on Antarctic Research, Lima, Peru 2010
“Neutrino physics at the South Pole”
9. Talk, 5th CERN Latin American School of High-Energy Physics, Antioquía, Colombia 2009
“Cosmic ray acceleration mechanisms”
8. Poster, 5th CERN Latin American School of High-Energy Physics, Antioquía, Colombia 2009
“Effect of energy-independent new physics on the high-energy astrophysical neutrino flavour ratios”
7. Poster, VII Latin American Symposium on High Energy Physics / IX Argentine Symposium on Particles and Fields, Bariloche Atomic Center, Argentina 2009
“Effect of energy-independent new physics on the high-energy astrophysical neutrino flavour ratios”
6. Talk, DISCRETE 2008, IFIC, Spain 2008
“Extreme scenarios of new physics in the UHE astrophysical neutrino flavour ratios”
5. Talk, XVII National Physics Symposium, PUCP, Peru 2008
“Modified dispersion relations and high-energy astrophysical neutrinos”
4. Poster, XI Mexican Workshop on Particles and Fields, Tuxtla, Mexico 2007
“Detecting the effects at IceCube of a quantum-gravity modified dispersion relation on the neutrino flux from FR-II radio galaxies and blazars”
3. Talk, A New Kind of Science Summer School 2005, Brown U. 2005
“Finding clusters of cellular automata rules with similar behavior”
2. Poster, Midwest New Kind of Science Conference 2005, Indiana U. 2005
“Two methods for finding cellular automata that perform simple computations”
1. Talk, VII National Symposium of Physics Students, PUCP, Peru 2003
“An introduction to cellular automata and Boolean networks”

Public talks and panels

8. “Astronomy on Tap”, Copenhagen, Denmark 2022
“The most energetic particles”
7. Journal Club Peru — Particle Physics (online) 2021
“Research in high-energy neutrinos: getting excited and getting started”
6. Association of Physics Students PUCP (online) 2021
“My experience in research: thoughts and lessons”
Video: facebook.com/watch/?v=217439216782462
5. Extraordinary Colloquium for the Undergraduate Symposium of Physics (CESPreFi), PUCP, Lima, Peru (online) 2020
“Starting out in research: why and how”
Video: facebook.com/watch/?v=1091597971253202
4. Wizard World Comic Con, Columbus, OH 2017
“Science of Superheroes” Panel
3. TEDxTukuy, Lima, Peru 2016
“Neutrinos: secret messengers of the Universe”
Video: <https://youtu.be/C6EZU9-nsKw> (In Spanish, English subtitles)
2. New Vistas in Astronomy Public Talk Series, Perkins Observatory, Delaware, OH 2016
“High-energy neutrinos: ghosts from beyond the Solar System”

1. “Astronomy on Tap”, Columbus, OH 2015
“Cosmic rays and neutrinos: windows into the ultra-high-energy Universe”

Research and collaboration visits

Laboratoire AstroParticule & Cosmologie (APC), Paris, France	2025
Program: Astrophysics Centre for Multi-messenger studies in Europe (ACME)	
Nordita, Stockholm University, Sweden	2024
Program: “Extragalactic and Galactic Neutrino Astronomy”	
Munich Institute for Astro- and Particle Physics (MIAPP), Munich, Germany	2018
Program: “The High Energy Universe: Gamma Ray, Neutrino, and Cosmic Ray Astronomy”	
Deutsches Elektronen-Synchrotron (DESY), Zeuthen, Germany	2016
Invited by: Walter Winter	
Niels Bohr Institute, Copenhagen, Denmark	2016
Invited by: Irene Tamborra	
Institut d’Astrophysique de Paris (IAP), Paris, France	2016
Invited by: Kumiko Kotera	
Laboratoire de Physique Nucléaire et de Hautes Énergies (LPNHE), Paris, France	2016
Invited by: Olivier Martineau	
Chiba University, Tokyo, Japan	2015
Invited by: Shigeru Yoshida	
Deutsches Elektronen-Synchrotron (DESY), Zeuthen, Germany	2015
Invited by: Walter Winter	
Mainz Institute for Theoretical Physics (MITP), Mainz, Germany	2015
Program: “Crossroads of Neutrino Physics”	
Institute for Nuclear Theory (INT), Seattle, WA	2015
Program: “Neutrino Astrophysics and Fundamental Properties” (INT-15-2A)	
Kavli Institute for Theoretical Physics (KITP), Santa Barbara, CA	2014
Program: “Present and Future Neutrino Physics”	
Instituto de Física Corpuscular (IFIC), Valencia, Spain	2014
Invited by: Joel Jones	
Institute for Advanced Study, Princeton, NJ	2013
Invited by: Kohta Murase	
Center for Cosmology and AstroParticle Physics (CCAPP), Columbus, OH	2013
Invited by: John Beacom	

Conferences, workshops, schools — participation as attendee

2nd Pheno in Indiana, Kentucky, Illinois, and Ohio (PIKIO), Ohio State U.	2016
1st MERCUR Winter School on Plasma-Astroparticle Physics, Bad Honnef, Germany	2014
Cosmic Ray Anisotropy Workshop, WIPAC, Madison, WI	2013
Helmholtz Alliance for Astroparticle Physics Realtime Astroparticle Physics Workshop, U. Bonn, Germany	2013
2012 CTEQ-Fermilab School on QCD and Electroweak Phenomenology, PUCP, Peru	2012
Workshop on Cosmic Rays and Cosmic Neutrinos: Looking at the Neutrino Sky, ICTP, Italy	2011
Summer School on Particle Physics, ICTP, Italy	2011
Workshop: From Neutrinos to Dark Matter, U. Guanajuato, Mexico	2006
6th Latin American Symposium on High Energy Physics / 12th Mexican School on Particles and Fields, Puerto Vallarta, Mexico	2006
Second School on Cosmic Rays and Astrophysics, Puebla, Mexico	2006

Advanced Summer School in Physics, CINVESTAV, Mexico	2006
School and Conference on Fundamental Aspects of Complexity, ICTP, Italy	2004

Popular press

Interviewed for CERN Courier about KM3NeT detection of first ultra-high-energy neutrino “Cosmogenic candidate lights up KM3NeT” [link]	2025
Interviewed for Scientific American article on radio-detection of neutrinos “Searching for the Universe’s Most Energetic Particles, Astronomers Turn on the Radio” [link]	2021
Press release about GRAND for AAAS EurekAlert! news service (author and contact person) “Giant neutrino telescope to open window to ultra-high-energy Universe” [link]	2019
Interviewed for Gizmodo “Astronomers Propose Huge New Telescope System to Understand the Most Energetic Particles Ever Detected” [link]	2018
Interviewed for Live Science “Bizarre Particles Keep Flying Out of Antarctica’s Ice, and They Might Shatter Modern Physics” [link]	2018
Article (third party), CERN Courier “The case of the disappearing neutrinos” [link]	2018
Article (authored), PuntoEdu PUCP Newsletter, Peru “Why is the scientific attitude relevant today?” (In Spanish) [link]	2017
Interview, Radio Show of National University of Cuyo, Argentina Magnetic wormholes (Audio in Spanish) [link]	2015
Article (authored), PuntoEdu PUCP Newsletter, Peru “Nuclear Fusion: The Golden Apples of the Sun” (In Spanish) [link]	2015
Article (authored), PuntoEdu PUCP Newsletter, Peru “The Enigma Code: Alan Turing and the birth of computer science” (In Spanish) [link]	2015
Article (third party), Big Ten Network “Ohio State scientist studies the largest explosions in the universe” [link]	2015
Article (third party), OSU News “Cosmic debris: Study looks inside the universe’s most powerful explosions” [link]	2015
Article (authored), PuntoEdu PUCP Newsletter, Peru “Is it possible to travel in space and time via a wormhole?” (In Spanish) [link]	2014
Article (authored), PuntoEdu PUCP Newsletter, Peru “Neil deGrasse Tyson’s “Cosmos” rediscovering our capacity to be awed” (In Spanish) [link]	2014
Article (authored), PuntoEdu PUCP Newsletter, Peru “Doing science together in Peru” (In Spanish) [link]	2014
Interview, PuntoEdu PUCP Newsletter, Peru “Cosmic rays have influenced evolution” (In Spanish) [link]	2014
Interview, Universia Latin American Academic Portal, Peru “Good ideas are not enough; results are necessary” (In Spanish) [link]	2008

Professional references

Prof. Markus Ahlers, Niels Bohr Institute, University of Copenhagen
markus.ahlers@nbi.ku.dk

Prof. John Beacom, Center for Cosmology and AstroParticle Physics, Ohio State University
beacom.7@osu.edu

Prof. Kumiko Kotera, Institut d'Astrophysique de Paris
kotera@iap.fr

Prof. Kohta Murase, Pennsylvania State University
murase@psu.edu

Prof. Irene Tamborra, Niels Bohr Institute, University of Copenhagen
tamborra@nbi.ku.dk

Prof. Walter Winter, DESY
walter.winter@desy.de

Prof. Shigeru Yoshida, Chiba University
syoshida@hepburn.s.chiba-u.ac.jp

Updated 2025.08.14