

Mauricio Bustamante

Contact information

Niels Bohr Institute	mbustamante@nbi.ku.dk
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Blegdamsvej 17	Office: +45 35 33 47 78
Copenhagen 2100, Denmark	http://mbustamante.net
Citizenship – Peru (born in Lima)	ORCID: 0000-0001-6923-0865

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

Postdoctoral Researcher, Niels Bohr Institute, U. of Copenhagen	2017–Present
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

Awards and distinctions

Ohio State U. Annual International Scholar Research Exposition	2016
CCAPP Postdoctoral Fellow, Ohio State U.	2014–Present
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

Refereed journal publications

Note: Author names in articles in the hep-ph category are ordered alphabetically.

19. **M. Bustamante**, M. Ahlers, *Inferring the Flavor of High-Energy Astrophysical Neutrinos at Their Sources*, In preparation
18. M. Ahlers, **M. Bustamante**, S. Mu, *Unitarity Bounds of Astrophysical Neutrinos*, Under evaluation in PRL [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*, Under evaluation in PRL [arXiv:1808.02042]
16. **M. Bustamante**, A. Connolly, *Measurement of the Energy-Dependent Neutrino-Nucleon Cross Section Above 10 TeV Using IceCube Showers*, Under evaluation in PRL [arXiv:1711.11043]
15. **M. Bustamante**, K. Murase, J.F. Beacom, *Testing Decay of Astrophysical Neutrinos with Incomplete Information*, PRD 95, 063013 (2017) [arXiv:1610.02096]
14. S.W. Li, **M. Bustamante**, J.F. Beacom, *Echo Technique to Distinguish Flavors of Astrophysical Neutrinos*, Under evaluation in PRL [arXiv:1606.06290]
13. **M. Bustamante**, K. Murase, W. Winter, *Multi-messenger light curves from gamma-ray bursts in the internal shock model*, ApJ 837, 33 (2017) [arXiv:1606.02325]
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]
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 50+](#)
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]
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]
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]
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 50+](#)
5. C.A. Argüelles, **M. Bustamante**, A.M. Gago, *Searching for cavities of various densities in the Earths 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, Joel 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]
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 and white papers

3. R. Alves-Batista *et al.*, *Open questions in cosmic-ray research at ultra-high energies*, Frontiers in Astronomy and Space Sciences, In preparation
2. GRAND Collaboration, *GRAND: Science and Design*, Contributor and editor [arXiv:1810.09994]
1. **M. Bustamante**, L. Cieri, J. Ellis, *Beyond the Standard Model for Montaneros*, Proceedings of the 5th CERN – Latin American School of High-Energy Physics, CERN Yellow Report CERN-2010-001, 1455 (2010) [arXiv:0911.4409]

Book chapters

1. **M. Bustamante**, “Perspectives for next-generation neutrino telescopes” in *Neutrino Telescopes*, World Scientific, In preparation

Conference proceedings

11. 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) [DOI: 10.22323/1.301.0589]
10. Q Gou, **M. Bustamante**, *et al.*, *The GRANDProto35 Experiment*, Proceedings of the 35th International Cosmic Ray Conference (ICRC 2017), PoS ICRC2017, 388 (2018) [DOI: 10.22323/1.301.0388]
9. 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]
8. Ke 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]
7. 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]
6. 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]
5. **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]
4. **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]
3. **M. Bustamante**, L. Cieri, J. Ellis, *Beyond the Standard Model for Montaneros*, Proceedings of the 5th CERN – Latin American School of High-Energy Physics, CERN Yellow Report CERN-2010-001, 1455 (2010) [arXiv:0911.4409]
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)

Professional activities

Proposal Reviewer, National Science Center, Poland	2018
Proposal Reviewer, Chilean Antarctic Institute	2017
Referee, Journal of High-Energy Physics (JHEP)	2018–Present
Referee, Journal of Cosmology and Astroparticle Physics (JCAP)	2018–Present
Referee, Advances in Space Research	2017–Present
Referee, Physical Review Letters	2015–Present
Referee, Physical Review D	2015–Present
Referee, The Astrophysical Journal	2015–Present
Referee, International Journal of Modern Physics A	2015–Present
Member, American Physical Society	2015–Present
Member, Deutsches Physikalische Gesellschaft (DPG, German Physical Society)	2012–Present
Member, Helmholtz Alliance for Astroparticle Physics HAP	2012–2014

Advising experience

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|---|--------------|
| 2. Charlotte Rosenstroem (M. Sc. student, Niels Bohr Institute, U. of Copenhagen) | 2018–Present |
| Co-advisor: Irene Tamborra | |
| “Secret interactions of high-energy astrophysical neutrinos” | |
| 1. Siqiao Mu (Undergrad, Caltech, SURF Program at NBI) | 2018 |
| Co-advisor: Markus Ahlers | |
| “Unitarity Bounds of Astrophysical Neutrinos” | |

Teaching experience

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

Scientific presentations, colloquia, seminars

Note: Invited talks are in bold font.

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| 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, Viena, 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. Cincinnatti 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

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

- 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 2006

Particles and Fields, Puerto Vallarta, Mexico	
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

Selected international collaborators

Markus Ahlers (U. Wisconsin–Madison, U.S.A.) • Carlos Argüelles (U. Wisconsin–Madison, U.S.A.)
 • John Beacom (Ohio State U., U.S.A.) • Amy Connolly (Ohio State U., U.S.A.) • Ke Fang (U. Maryland, U.S.A.) • Alberto Gago (PUCP, Peru) • Shunsaku Horiuchi (Virginia Tech, U.S.A.)
 • Kumiko Kotera (Institut d’Astrophysique de Paris, France) • Shirley Li (Ohio State U., U.S.A.)
 • Olivier Martineau (LPNHE, France) • Omar Miranda (CINVESTAV, Mexico) • Kohta Murase (Penn State U., U.S.A.) • Carlos Peña-Garay (IFIC, Spain) • Irene Tamborra (Niels Bohr Institute, Denmark) • Walter Winter (DESY, Germany)

Experimental collaborations

GRAND (Giant Radio Array for Neutrino Detection)	2015–Present
Member of the core team of the collaboration, work on building science case, editor of the white paper	

Organization of scientific events

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

Popular press

Interviewed for Gizmodo	2018
“Astronomers Propose Huge New Telescope System to Understand the Most Energetic Particles Ever Detected”: https://goo.gl/jaGr2S	
Interviewed for Live Science	2018
“Bizarre Particles Keep Flying Out of Antarctica’s Ice, and They Might Shatter Modern Physics”: https://goo.gl/AfBwMr	
Article (third party), CERN Courier	2018
“The case of the disappearing neutrinos”: goo.gl/GaZHFy	

Article (authored), PuntoEdu PUCP Newsletter, Peru	2017
“Why is the scientific attitude relevant today?” (In Spanish): goo.gl/7FB9wX	
Interview, Radio Show of National University of Cuyo, Argentina	2015
Magnetic wormholes (Audio in Spanish): goo.gl/umnEKr	
Article (authored), PuntoEdu PUCP Newsletter, Peru	2015
“Nuclear Fusion: The Golden Apples of the Sun” (In Spanish): goo.gl/H8wyd4	
Article (authored), PuntoEdu PUCP Newsletter, Peru	2015
“The Enigma Code: Alan Turing and the birth of computer science” (In Spanish): goo.gl/ScJmd2	
Article (third party), Big Ten Network	2015
“Ohio State scientist studies the largest explosions in the universe”: goo.gl/zr7K9S	
Article (third party), OSU News	2015
“Cosmic debris: Study looks inside the universes most powerful explosions”: goo.gl/LZyFkp	
Article (authored), PuntoEdu PUCP Newsletter, Peru	2014
“Is it possible to travel in space and time via a wormhole?” (In Spanish): goo.gl/zi3D9m	
Article (authored), PuntoEdu PUCP Newsletter, Peru	2014
“Neil deGrasse Tyson’s “Cosmos”: rediscovering our capacity to be awed” (In Spanish): goo.gl/whdxZf	
Article (authored), PuntoEdu PUCP Newsletter, Peru	2014
“Doing science together in Peru” (In Spanish): goo.gl/gpgHa1	
Interview, PuntoEdu PUCP Newsletter, Peru	2014
“Cosmic rays have influenced evolution” (In Spanish): goo.gl/XUhz5V	
Interview, Universia Latin American Academic Portal, Peru	2008
“Good ideas are not enough; results are necessary” (In Spanish): goo.gl/Ndc0r1	

Copenhagen, 2018.11.05