

Mauricio Bustamante
Assistant Professor
Niels Bohr International Academy
Theoretical high energy, astroparticle and gravitational physics



Postal address:

Blegdamsvej 17
B
2100

København Ø

Postal address:

Blegdamsvej 17
2100

København Ø

Email: Mbustamante@nbi.ku.dk

Mobile: +4522230566

Phone: +45 22 23 05 66, +4535334778

Web address: <https://mbustamante.net/>, <http://mbustamante.net/>

Qualifications

Physics, PhD

2012 → 2014

Physics, M. Sc.

2007 → 2010

Physics, B. Sc.

2001 → 2006

Employment

Niels Bohr International Academy

København Ø

1 Oct 2020 → 30 Sep 2024

Assistant Professor

Theoretical high energy, astroparticle and gravitational physics

København Ø, Denmark

1 Oct 2017 → nu

Research output

The Milky Way shines in high-energy neutrinos

Bustamante, Mauricio, 13 Dec 2023, In: Nature Reviews Physics. 6, p. 8-10 3 p.

Searches for dark matter decay with ultrahigh-energy neutrinos endure backgrounds

Fiorillo, Damiano Francesco G, Valera, Victor, Bustamante, Mauricio & Winter, W., 8 Nov 2023, In: Physical Review D. 108, 10, 26 p., 103012.

Neutrino self-interactions: A white paper

Berryman, J. M., Blinov, N., Brdar, V., Brinckmann, T., Bustamante, M., Cyr-Racine, F. Y., Das, A., de Gouvêa, A., Denton, P. B., Dev, P. S. B., Dutta, B., Esteban, I., Fiorillo, D., Gerbino, M., Ghosh, S., Ghosh, T., Grohs, E., Han, T., Hannestad, S., Hostert, M. & 14 others, Huber, P., Hyde, J., Kelly, K. J., Kling, F., Liu, Z., Lattanzi, M., Loverde, M., Pandey, S., Saviano, N., Sen, M., Shoemaker, I. M., Tangarife, W., Zhang, Y. & Zhang, Y., 29 Sep 2023, In: Physics of the Dark Universe. 42, 25 p., 101267.

Present and future constraints on flavor-dependent long-range interactions of high-energy astrophysical neutrinos

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Singh, M., Bustamante, Mauricio & Agarwalla, S. K., 17 Aug 2023, In: Journal of High Energy Physics. 2023, 8, 36 p., 101.

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Fiorillo, Damiano Francesco G & Bustamante, Mauricio, 4 Apr 2023, In: Physical Review D. 107, 30 p., 083008.

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Near-future discovery of the diffuse flux of ultrahigh-energy cosmic neutrinos
Valera, Victor, Bustamante, Mauricio & Glaser, C., 16 Feb 2023, In: Physical Review D. 107, 4, 43 p., 043019.

Snowmass white paper: beyond the standard model effects on neutrino flavor
Arguelles, C. A., Barenboim, G., Bustamante, M., Coloma, P., Denton, P. B., Esteban, G. F., Farzan, Y., Martinez, E. F., Forero, D., Gago, A. M., Katori, T., Lehnert, R., Ross-Lonergan, M., Suliga, A. M., Tabrizi, Z., Anchordoqui, L., Chakraborty, K., Conrad, J., Das, A., Fong, C. S. & 6 others, Littlejohn, B. R., Maltoni, M., Parno, D., Spitz, J., Tang, J. & Wissel, S., 11 Jan 2023, In: European Physical Journal C. 83, 1, 57 p., 15.

High-energy and ultra-high-energy neutrinos: A Snowmass white paper
Ackermann, M., Agarwalla, S. K., Alvarez-Muniz, J., Batista, R. A., Arguelles, C. A., Bustamante, M., Clark, B. A., Cummings, A., Das, S., Decoene, V., Denton, P. B., Dornic, D., Dzhalikbaev, Z.-A., Farzan, Y., Garcia, A., Garzelli, M. V., Glaser, C., Heijboer, A., Horandel, J. R., Illuminati, G. & 26 others, Jeong, Y. S., Kelley, J. L., Kelly, K. J., Kheirandish, A., Klein, S. R., Krizmanic, J. F., Larson, M. J., Lu, L., Murase, K., Narang, A., Otte, N., Prechelt, R. L., Prohira, S., Reno, M. H., Resconi, E., Santander, M., Valera, Victor, Vandenbroucke, J., Suvorova, O. V., Wiencke, L., Wissel, S., Yoshida, S., Yuan, T., Zas, E., Zhelning, P. & Zhou, B., Nov 2022, In: Journal of High Energy Astrophysics. 36, p. 55-110 56 p.

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PLEvM: A global and distributed monitoring system of high-energy astrophysical neutrinos
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Flavors of astrophysical neutrinos with active-sterile mixing
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The Future of High-Energy Astrophysical Neutrino Flavor Measurements

Song, N., Weishi Li, S., Argüelles, C., Bustamante, Mauricio & Vincent, A. C., 12 Jul 2021, In: P o S - Proceedings of Science. 395, 8 p., ICRC 1178.

The POEMMA (Probe of Extreme Multi-Messenger Astrophysics) observatory

Olinto, A., Krizmanic, J., Adams, J. H., Aloisio, R., Anchordoqui, L. A., Anzalone, A., Bagheri, M., Barghini, D., Battisti, M., Bergman, D. R., Bertaina, M. E., Bertone, P. F., Bisconti, F., Bustamante, M., Cafagna, F., Caruso, R., Casolino, M., Cerny, K., Christl, M. J., Cummings, A. L. & 31 others, De Mitri, Diesing, R., Engel, R., Eser, J., Fang, K., Fenu, F., Filippatos, G., Gazda, E., Guepin, C., Haungs, A., Hays, E. A., Judd, E. G., Klimov, P., Kungel, Kuznetsov, E., Mackovjak, S., Mandat, D., Marcelli, L., McEnery, J., Medina-Tanco, G., Merenda, K., Meyer, S. S., Mitchell, J. W., Miyamoto, H., Nachtman, J. M., Neronov, A., Oikonomou, F., Otte, A. N., Ricci, M., Unger, M. & POEMMA Collaboration, P. C., Jun 2021, In: Journal of Cosmology and Astroparticle Physics. 2021, 6, 66 p., 007.

The Future of High-Energy Astrophysical Neutrino Flavor Measurements

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Core-collapse supernovae stymie secret neutrino interactions

Shalgar, Shashank, Tamborra, Irene & Bustamante, Mauricio, 2021, In: Physical Review D. 103, 9 p., 123008.

Using High-Energy Neutrinos As Cosmic Magnetometers

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The Giant Radio Array for Neutrino Detection (GRAND): Science and design

Alvarez-Muniz, J., Batista, R. A., Balagopal, A., Bolmont, J., Bustamante, M., Carvalho, W., Charrier, D., Cognard, I., Decoene, V., Denton, P. B., De Jong, S., De Vries, K. D., Engel, R., Fang, K., Finley, C., Gabici, S., Gou, Q., Gu, J., Guepin, C., Hu, H. & 31 others, Huang, Y., Kotera, K., Le Coz, S., Lenain, J., Lu, G., Martineau-Huynh, O., Mostafa, M., Mottez, F., Murase, K., Niess, V., Oikonomou, F., Pierog, T., Qian, X., Qin, B., Ran, D., Renault-Tinacci, N., Roth, M., Schroeder, F. G., Schussler, F., Tasse, C., Timmermans, C., Tueros, M., Wu, X., Zarka, P., Zech, A., Zhang, B. T., Zhang, J., Zhang, Y., Zheng, Q., Zilles, A. & GRAND Collaboration, G. C., 4 Aug 2020, In: Science China Physics, Mechanics and Astronomy. 63, 1, 43 p., 219501.

Fundamental Physics with High-Energy Astrophysical Neutrinos Today and in the Future

Argüelles, C., Bustamante, Mauricio, Kheirandish, A., Palomares-Ruiz, S., Salas-Salvadó, J. & Vincent, A. C., 22 Jul 2020, In: P o S - Proceedings of Science. 358, 8 p., 849.

Pushing the Energy and Cosmic Frontiers with High-Energy Astrophysical Neutrinos¹

Bustamante, Mauricio, 12 May 2020, In: Journal of Physics: Conference Series (Online). 1586, 9 p., 012041.

Bounds on secret neutrino interactions from high-energy astrophysical neutrinos

Bustamante, Mauricio, Rosenstrøm, C. A., Shalgar, Shashank & Tamborra, Irene, 2020, In: Physical Review D. 101, 12, 12 p., 123024.

Observing GeV Neutrino Transients in the Multi-Messenger Era

Ahmed Maouloud, S. E. M., de Wasseige, G., Ahlers, Markus Tobias, Bustamante, Mauricio & van Elewyck, V., 22 Jul 2019, In: P o S - Proceedings of Science. 358, 8 p., 1023.

Fundamental physics with high-energy cosmic neutrinos today and in the future

Argüelles, C. A., Bustamante, Mauricio, Kheirandish, A., Palomares-Ruiz, S., Salgado, J. & Vincent, A. C., 19 Jul 2019, In: P o S - Proceedings of Science. 8 p.

Astrophysics Uniquely Enabled by Observations of High-Energy Cosmic Neutrinos

Vieregg, A., Ackermann, M., Ahlers, Markus Tobias, Bustamante, Mauricio, Anchordoqui, L., Connolly, A., Deaconu, C., Grant, D., Gorham, P., Halzen, F., Karle, A., Kotera, K., Kowalski, M., Mostafa, M. A., Murase, K., Nelles, A., Olinto, A., Romero-Wolf, A. & Wissel, S., 31 May 2019, In: Bulletin of the American Astronomical Society. 51, 3, 26 p.

Fundamental Physics with High-Energy Cosmic Neutrinos

Vieregg, A., Ackermann, M., Ahlers, Markus Tobias, Anchordoqui, L., Bustamante, Mauricio, Connolly, A., Deaconu, C., Grant, D., Gorham, P., Halzen, F., Karle, A., Kotera, K., Kowalski, M., Mostafa, M. A., Murase, K., Nelles, A., Olinto, A., Romero-Wolf, A. & Wissel, S., 31 May 2019, In: Bulletin of the American Astronomical Society. 51, 3, 24 p., 215.

Echo Technique to Distinguish Flavors of Astrophysical Neutrinos

Li, S. W., Bustamante, Mauricio & Beacom, J. F., 16 Apr 2019, In: Physical Review Letters. 122, 15, 7 p., 151101.

Open Questions in Cosmic-Ray Research at Ultrahigh Energies

Batista, R. A., Biteau, J., Bustamante, Mauricio, Dolag, K., Engel, R., Fang, K., Kampert, K., Kostunin, D., Mostafa, M., Murase, K., Sigl, G., Oikonomou, F., Olinto, A. V., Panasyuk, M. I., Taylor, A. & Unger, M., 15 Mar 2019, In: Frontiers in Astronomy and Space Sciences. 6, 35 p., 23.

Universe's Worth of Electrons to Probe Long-Range Interactions of High-Energy Astrophysical Neutrinos

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Olinto, A. V., Adams, J. H., Aloisio, R., Anchordoqui, L. A., Bergman, D. R., Bertaina, M. E., Bertone, P., Bustamante, M., Christl, M. J., Csorna, S. E., Eser, J. B., Fenu, F., Guépin, C., Hays, E. A., Hunter, S., Judd, E., Jun, I., Kotera, K., Krizmanic, J. F., Kuznetsov, E. & 21 others, Mackovjak, S., Martinez-Sierra, L. M., Mastafa, M., Matthews, J. N., McEnery, J., Mitchell, J. W., Neronov, A., Otte, A. N., Parizot, E., Paul, T. C., Perkins, J. S., Prevot, G., Reardon, P., Reno, M. H., Sarazin, F., Shinozaki, K., Stecker, F., Streitmatter, R., Venters, T., Wiencke, L. & Young, R. M., 25 Aug 2018, In: P o S - Proceedings of Science. 301, 8 p., 542.

The Giant Radio Array for Neutrino Detection

Martineau-Huynh, O., Bustamante, M., Carvalho, W., Charrier, D., Jong, S. D., Vries, K. D. D., Fang, K., Feng, Z., Finley, C., Gou, Q., Gu, J., Hu, H., Kotera, K., Coz, S. L., Medina, C., Murase, K., Niess, V., Oikonomou, F., Timmermans, C., Wang, Z. & 2 others, Wu, X. & Zhang, Y., 5 Feb 2017, In: E P J Web of Conferences. 135, 02001.

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Allison, P., Auffenberg, J., Bard, R., Beatty, J. J., Besson, D. Z., Bora, C., Chen, C. -C., Chen, P., Connolly, A., Davies, J. P., DuVernois, M. A., Fox, B., Gorham, P. W., Hanson, K., Hill, B., Hoffman, K. D., Hong, E., Hu, L. -C., Ishihara, A., Karle, A. & 32 others, Kelley, J., Kravchenko, I., Landsman, H., Landrie, A., Li, C. -, Liu, T., Lu, M. -, Maunu, R., Mase, K., Meures, T., Miki, C., Nam, J., Nichol, R. J., Nir, G., O'Murchadha, A., Pfendner, C. G., Ratzlaff, K., Rotter, B., Sandstrom, P., Seckel, D., Shultz, A., Song, M., Stockham, J., Stockham, M., Sullivan, M., Touart, J., Tu, H. -, Varner, G. S., Yoshida, S., Young, R., Bustamante, Mauricio & Guetta, D., 1 Feb 2017, In: Astroparticle Physics. 88, p. 7-16

Testing decay of astrophysical neutrinos with incomplete information

Bustamante, Mauricio, Beacom, J. F. & Murase, K., 6 Oct 2016, In: Physical Review D. 95, 063013.

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Heinze, J., Boncioli, D., Bustamante, Mauricio & Winter, W., 11 Jul 2016, In: The Astrophysical Journal. 825, 2, 122.

Multi-messenger light curves from gamma-ray bursts in the internal shock model

Bustamante, Mauricio, Heinze, J., Murase, K. & Winter, W., 7 Jun 2016, In: *Astrophysical Journal*. 837, 33.

Searching for cavities of various densities in the Earth's crust with a low-energy electron-antineutrino beta-beam

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Theoretically palatable flavor combinations of astrophysical neutrinos

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UHE neutrino and cosmic ray emission from GRBs: revising the models and clarifying the cosmic ray-neutrino connection

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Are gamma-ray bursts the sources of ultra-high energy cosmic rays?

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Escape and propagation of UHECR protons and neutrons from GRBs, and the cosmic ray-neutrino connection

Bustamante, Mauricio, Baerwald, P. & Winter, W., 12 Jun 2013, In: *Brazilian Journal of Physics*. 44

UHECR escape mechanisms for protons and neutrons from GRBs, and the cosmic ray-neutrino connection

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Neutrino Decays over Cosmological Distances and the Implications for Neutrino Telescopes

Baerwald, P., Bustamante, Mauricio & Winter, W., 22 Aug 2012, In: *Journal of Cosmology and Astroparticle Physics*. 2012

SUSY Renormalization Group Effects in Ultra High Energy Neutrinos

Bustamante, Mauricio, Gago, A. M. & Jones-Perez, J., 13 Dec 2010, In: *Journal of High Energy Physics*. 2011, 05, 133.

IceCube expectations for two high-energy neutrino production models at active galactic nuclei

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Energy-independent new physics in the flavour ratios of high-energy astrophysical neutrinos

Bustamante, Mauricio, Gago, A. M. & Pena-Garay, C., 27 Jan 2010, In: *Journal of High Energy Physics*. 2010, 066

Beyond the Standard Model for Montaneros

Bustamante, Mauricio, Cieri, L. & Ellis, J., 23 Nov 2009

High energy astrophysical neutrino flux and modified dispersion relations

Alba, J. L. B., Bustamante, Mauricio, Gago, A. M. & Miranda, O. G., 11 Jul 2009, In: *International Journal of Modern Physics A*. 24, 31, 5819.

Extreme scenarios of new physics in the UHE astrophysical neutrino flavour ratios

Bustamante, Mauricio, Gago, A. M. & Pena-Garay, C., 29 Jun 2009, In: *Journal of Physics: Conference Series*. 171, 012048.

Activities

TeV Particle Astrophysics 2017

Bustamante, Mauricio (Participant)

7 Aug 2017 → 11 Aug 2017

Advances in Space Research (Journal)

Bustamante, Mauricio (Editor)

2017 → ...

Astrophysical Journal (Journal)

Bustamante, Mauricio (Editor)

2015 → ...

International Journal of Modern Physics A (Journal)

Bustamante, Mauricio (Editor)

2015 → ...

Physical Review D - Particles, Fields, Gravitation and Cosmology (Journal)

Bustamante, Mauricio (Editor)

2015 → ...

Physical Review Letters (Journal)

Bustamante, Mauricio (Editor)

2015 → ...