

# Publication List

Peter B. Denton

Updated: September 4, 2024<sup>\*†</sup>

## Articles (67)

- [1] P. B. Denton and J. Gehrlein, “A Modern Look at the Oscillation Physics Case for a Neutrino Factory,” [arXiv:2407.02572 \[hep-ph\]](#).
- [2] J. F. Acevedo, J. Berger, and P. B. Denton, “Dark Matter Raining on DUNE and Other Large Volume Detectors,” [arXiv:2407.01670 \[hep-ph\]](#).
- [3] P. B. Denton and S. J. Parke, “Fast and Accurate Algorithm for Calculating Long-Baseline Neutrino Oscillation Probabilities with Matter Effects: NuFast,” [arXiv:2405.02400 \[hep-ph\]](#).
- [4] P. B. Denton and S. J. Parke, “Smallness of matter effects in long-baseline muon neutrino disappearance,” *Phys. Rev. D* **109** no. 5, (2024) 053002, [arXiv:2401.10326 \[hep-ph\]](#).
- [5] P. B. Denton, “CP-Violation with Neutrino Disappearance,” *PRL (in press)*, [arXiv:2309.03262 \[hep-ph\]](#).
- [6] P. B. Denton and J. Gehrlein, “Survey of neutrino flavor predictions and the neutrinoless double beta decay funnel,” *Phys. Rev. D* **109** no. 5, (2024) 055028, [arXiv:2308.09737 \[hep-ph\]](#).
- [7] P. B. Denton and J. Gehrlein, “Neutrino constraints and the ATOMKI X17 anomaly,” *Phys. Rev. D* **108** no. 1, (2023) 015009, [arXiv:2304.09877 \[hep-ph\]](#).
- [8] P. B. Denton and J. Gehrlein, “Here Comes the Sun: Solar Parameters in Long-Baseline Accelerator Neutrino Oscillations,” *JHEP* **06** (2023) 090, [arXiv:2302.08513 \[hep-ph\]](#).
- [9] P. B. Denton, “Techniques for solving static Klein-Gordon equation with self-interaction  $\lambda\phi^4$  and arbitrary spherical source terms,” *Phys. Lett. B* **855** (2024) 138860, [arXiv:2301.11106 \[physics.comp-ph\]](#).

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<sup>\*</sup>For the latest version see: [peterdenton.github.io](https://peterdenton.github.io)

<sup>†</sup>Most author lists are in alphabetical order as that is the standard in particle physics.

- [10] H. Davoudiasl and P. B. Denton, “Sterile neutrino shape shifting caused by dark matter,” *Phys. Rev. D* **108** no. 3, (2023) 035013, [arXiv:2301.09651 \[hep-ph\]](#).
- [11] P. B. Denton, M. Friend, M. D. Messier, H. A. Tanaka, S. Böser, J. a. A. B. Coelho, M. Perrin-Terrin, and T. Stuttard, “Snowmass Neutrino Frontier: NF01 Topical Group Report on Three-Flavor Neutrino Oscillations,” [arXiv:2212.00809 \[hep-ph\]](#).
- [12] P. Huber *et al.*, “Snowmass Neutrino Frontier Report,” 11, 2022. [arXiv:2211.08641 \[hep-ex\]](#).
- [13] P. B. Denton, A. Giarnetti, and D. Meloni, “How to identify different new neutrino oscillation physics scenarios at DUNE,” *JHEP* **02** (2023) 210, [arXiv:2210.00109 \[hep-ph\]](#).
- [14] A. de Gouvêa *et al.*, “Theory of Neutrino Physics – Snowmass TF11 (aka NF08) Topical Group Report,” [arXiv:2209.07983 \[hep-ph\]](#).
- [15] A. Coleman *et al.*, “Ultra high energy cosmic rays The intersection of the Cosmic and Energy Frontiers,” *Astropart. Phys.* **149** (2023) 102819, [arXiv:2205.05845 \[astro-ph.HE\]](#).
- [16] P. B. Denton and J. Gehrlein, “New reactor data improves robustness of neutrino mass ordering determination,” *Phys. Rev. D* **106** (2022) 015022, [arXiv:2204.09060 \[hep-ph\]](#).
- [17] C. A. Argüelles *et al.*, “Snowmass white paper: beyond the standard model effects on neutrino flavor: Submitted to the proceedings of the US community study on the future of particle physics (Snowmass 2021),” *Eur. Phys. J. C* **83** no. 1, (2023) 15, [arXiv:2203.10811 \[hep-ph\]](#).
- [18] M. Ackermann *et al.*, “High-energy and ultra-high-energy neutrinos: A Snowmass white paper,” *JHEAp* **36** (2022) 55–110, [arXiv:2203.08096 \[hep-ph\]](#).
- [19] M. Abdullah *et al.*, “Coherent elastic neutrino-nucleus scattering: Terrestrial and astrophysical applications,” in *2022 Snowmass Summer Study*. 3, 2022. [arXiv:2203.07361 \[hep-ph\]](#).
- [20] M. A. Acero *et al.*, “White Paper on Light Sterile Neutrino Searches and Related Phenomenology,” [arXiv:2203.07323 \[hep-ex\]](#).
- [21] E. Abdalla *et al.*, “Cosmology intertwined: A review of the particle physics, astrophysics, and cosmology associated with the cosmological tensions and anomalies,” *JHEAp* **34** (2022) 49–211, [arXiv:2203.06142 \[astro-ph.CO\]](#).
- [22] P. B. Denton\* *et al.*, “Tau neutrinos in the next decade: from GeV to EeV,” *J. Phys. G* **49** no. 11, (2022) 110501, [arXiv:2203.05591 \[hep-ph\]](#). \*Co-Editor.

- [23] J. L. Feng *et al.*, “The Forward Physics Facility at the High-Luminosity LHC,” *J. Phys. G* **50** no. 3, (2023) 030501, [arXiv:2203.05090 \[hep-ex\]](#).
- [24] J. M. Berryman *et al.*, “Neutrino self-interactions: A white paper,” *Phys. Dark Univ.* **42** (2023) 101267, [arXiv:2203.01955 \[hep-ph\]](#).
- [25] D. Caratelli *et al.*, “Low-Energy Physics in Neutrino LArTPCs,” 3, 2022. [arXiv:2203.00740 \[physics.ins-det\]](#).
- [26] P. B. Denton, “Sterile Neutrino Search with MicroBooNE’s Electron Neutrino Disappearance Data,” *Phys. Rev. Lett.* **129** no. 6, (2022) 061801, [arXiv:2111.05793 \[hep-ph\]](#).
- [27] P. B. Denton and R. Pestes, “Neutrino oscillations through the Earth’s core,” *Phys. Rev. D* **104** no. 11, (2021) 113007, [arXiv:2110.01148 \[hep-ph\]](#).
- [28] P. B. Denton, “Tau neutrino identification in atmospheric neutrino oscillations without particle identification or unitarity,” *Phys. Rev. D* **104** no. 11, (2021) 113003, [arXiv:2109.14576 \[hep-ph\]](#).
- [29] P. B. Denton and J. Gehrlein, “New oscillation and scattering constraints on the tau row matrix elements without assuming unitarity,” *JHEP* **06** (2022) 135, [arXiv:2109.14575 \[hep-ph\]](#).
- [30] L. A. Anchordoqui *et al.*, “The Forward Physics Facility: Sites, experiments, and physics potential,” *Phys. Rept.* **968** (2022) 1–50, [arXiv:2109.10905 \[hep-ph\]](#).
- [31] H. Davoudiasl, P. B. Denton, and J. Gehrlein, “Connecting the Extremes: A Story of Supermassive Black Holes and Ultralight Dark Matter,” *Phys. Rev. Lett.* **128** no. 8, (2022) 081101, [arXiv:2109.01678 \[astro-ph.CO\]](#).
- [32] P. B. Denton and S. J. Parke, “Parameter symmetries of neutrino oscillations in vacuum, matter, and approximation schemes,” *Phys. Rev. D* **105** no. 1, (2022) 013002, [arXiv:2106.12436 \[hep-ph\]](#).
- [33] H. Davoudiasl, P. B. Denton, and D. A. McGady, “Ultralight Fermionic Dark Matter,” *Phys. Rev. D* **103** (2021) 055014, [arXiv:2008.06505 \[hep-ph\]](#).
- [34] P. B. Denton and J. Gehrlein, “A Statistical Analysis of the COHERENT Data and Applications to New Physics,” *JHEP* **04** (2021) 266, [arXiv:2008.06062 \[hep-ph\]](#).
- [35] P. B. Denton, J. Gehrlein, and R. Pestes, “CP-Violating Neutrino Non-Standard Interactions in Long-Baseline-Accelerator Data,” *Phys. Rev. Lett.* **126** (2021) 051801, [arXiv:2008.01110 \[hep-ph\]](#).
- [36] P. B. Denton and Y. Kini, “Ultra-High-Energy Tau Neutrino Cross Sections with GRAND and POEMMA,” *Phys. Rev. D* **102** (2020) 123019, [arXiv:2007.10334 \[astro-ph.HE\]](#).

- [37] H. Davoudiasl, P. B. Denton, and J. Gehrlein, “An Attractive Scenario for Light Dark Matter Direct Detection,” *Phys. Rev. D* **102** (7, 2020) 091701, [arXiv:2007.04989 \[hep-ph\]](#).
- [38] P. B. Denton and R. Pestes, “The Impact of Different Parameterizations on the Interpretation of CP Violation in Neutrino Oscillations,” *JHEP* **05** (2021) 139, [arXiv:2006.09384 \[hep-ph\]](#).
- [39] A. Abdullahi and P. B. Denton, “Visible Decay of Astrophysical Neutrinos at IceCube,” *Phys. Rev. D* **102** no. 2, (2020) 023018, [arXiv:2005.07200 \[hep-ph\]](#).
- [40] P. B. Denton, “A Return To Neutrino Normalcy,” [arXiv:2003.04319 \[hep-ph\]](#).
- [41] P. B. Denton, S. J. Parke, and X. Zhang, “Fibonacci Fast Convergence for Neutrino Oscillations in Matter,” *Phys. Lett. B* **807** (2020) 135592, [arXiv:1909.02009 \[hep-ph\]](#).
- [42] P. B. Denton, S. J. Parke, T. Tao, and X. Zhang, “Eigenvectors from Eigenvalues: a survey of a basic identity in linear algebra,” *Bull. Am. Math. Soc.* (8, 2019) , [arXiv:1908.03795 \[math.RA\]](#).
- [43] C. A. Argüelles *et al.*, “New opportunities at the next-generation neutrino experiments I: BSM neutrino physics and dark matter,” *Rept. Prog. Phys.* **83** no. 12, (2020) 124201, [arXiv:1907.08311 \[hep-ph\]](#).
- [44] P. B. Denton, S. J. Parke, and X. Zhang, “Eigenvalues: the Rosetta Stone for Neutrino Oscillations in Matter,” *Phys. Rev. D* **101** (2020) 093001, [arXiv:1907.02534 \[hep-ph\]](#).
- [45] P. Bhupal Dev\*, K. Babu\*, P. B. Denton\*, P. A. Machado\*, *et al.*, “Neutrino Non-Standard Interactions: A Status Report,” *SciPost Phys. Proc.* **2** (2019) 001, [arXiv:1907.00991 \[hep-ph\]](#). \*Co-Editors.
- [46] H. Davoudiasl and P. B. Denton, “Ultra Light Boson Dark Matter and Event Horizon Telescope Observations of M87\*,” *Phys. Rev. Lett.* **123** (2019) 021102, [arXiv:1904.09242 \[astro-ph.CO\]](#).
- [47] G. A. Barenboim, P. B. Denton, and I. M. Oldengott, “Inflation meets neutrinos,” *Phys. Rev.* **D99** (2019) 083515, [arXiv:1903.02036 \[astro-ph.CO\]](#).
- [48] P. B. Denton and S. J. Parke, “Simple and Precise Factorization of the Jarlskog Invariant for Neutrino Oscillations in Matter,” *Phys. Rev.* **D100** (2019) 053004, [arXiv:1902.07185 \[hep-ph\]](#).
- [49] G. Barenboim, P. B. Denton, S. J. Parke, and C. A. Ternes, “Neutrino oscillation probabilities through the looking glass,” *Phys. Lett. B* **791** (2019) 351–360, [arXiv:1902.00517 \[hep-ph\]](#).

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- [51] K. Møller, P. B. Denton, and I. Tamborra, “Cosmogenic Neutrinos Through the GRAND Lens Unveil the Nature of Cosmic Accelerators,” *JCAP* **1905** (2019) 047, [arXiv:1809.04866 \[astro-ph.HE\]](#).
- [52] P. B. Denton and S. J. Parke, “The Effective  $\Delta m_{ee}^2$  in Matter,” *Phys. Rev.* **D98** (2018) 093001, [arXiv:1808.09453 \[hep-ph\]](#).
- [53] P. B. Denton, S. J. Parke, and X. Zhang, “Rotations Versus Perturbative Expansions for Calculating Neutrino Oscillation Probabilities in Matter,” *Phys. Rev.* **D98** no. 3, (2018) 033001, [arXiv:1806.01277 \[hep-ph\]](#).
- [54] P. B. Denton and I. Tamborra, “Invisible Neutrino Decay Resolves IceCube’s Track and Cascade Tension,” *Phys. Rev. Lett.* **121** no. 12, (2018) 121802, [arXiv:1805.05950 \[hep-ph\]](#).
- [55] P. B. Denton, Y. Farzan, and I. M. Shoemaker, “Testing large non-standard neutrino interactions with arbitrary mediator mass after COHERENT data,” *JHEP* **07** (2018) 037, [arXiv:1804.03660 \[hep-ph\]](#).
- [56] K. Møller, A. M. Suliga, I. Tamborra, and P. B. Denton, “Measuring the supernova unknowns at the next-generation neutrino telescopes through the diffuse neutrino background,” *JCAP* **1805** (2018) 066, [arXiv:1804.03157 \[astro-ph.HE\]](#).
- [57] P. B. Denton and I. Tamborra, “The Bright and Choked Gamma-Ray Burst Contribution to the IceCube and ANTARES Low-Energy Excess,” *JCAP* **1804** no. 04, (2018) 058, [arXiv:1802.10098 \[astro-ph.HE\]](#).
- [58] P. B. Denton and S. J. Parke, “Addendum to “Compact perturbative expressions for neutrino oscillations in matter”,,” *JHEP* **06** (2018) 109, [arXiv:1801.06514 \[hep-ph\]](#).
- [59] P. B. Denton and I. Tamborra, “Exploring the Properties of Choked Gamma-ray Bursts with IceCube’s High-energy Neutrinos,” *Astrophys. J.* **855** no. 1, (2018) 37, [arXiv:1711.00470 \[astro-ph.HE\]](#).
- [60] P. B. Denton, D. Marfatia, and T. J. Weiler, “The Galactic Contribution to IceCube’s Astrophysical Neutrino Flux,” *JCAP* **1708** no. 08, (2017) 033, [arXiv:1703.09721 \[astro-ph.HE\]](#).
- [61] P. Coloma, P. B. Denton, M. C. Gonzalez-Garcia, M. Maltoni, and T. Schwetz, “Curtailling the Dark Side in Non-Standard Neutrino Interactions,” *JHEP* **04** (2017) 116, [arXiv:1701.04828 \[hep-ph\]](#).
- [62] P. B. Denton, H. Minakata, and S. J. Parke, “Compact Perturbative Expressions For Neutrino Oscillations in Matter,” *JHEP* **06** (2016) 051, [arXiv:1604.08167 \[hep-ph\]](#).

- [63] P. B. Denton and T. J. Weiler, “Sensitivity of full-sky experiments to large scale cosmic ray anisotropies,” *JHEAp* **8** (2015) 1–9, [arXiv:1505.03922 \[astro-ph.HE\]](#).
- [64] P. B. Denton and T. J. Weiler, “The Fortuitous Latitude of the Pierre Auger Observatory and Telescope Array for Reconstructing the Quadrupole Moment,” *Astrophys.J.* **802** no. 1, (2015) 25, [arXiv:1409.0883 \[astro-ph.HE\]](#).
- [65] L. A. Anchordoqui, P. B. Denton, H. Goldberg, T. C. Paul, L. H. M. Da Silva, B. J. Vlcek, and T. J. Weiler, “Weinberg’s Higgs portal confronting recent LUX and LHC results together with upper limits on  $B^+$  and  $K^+$  decay into invisibles,” *Phys. Rev.* **D89** no. 8, (2014) 083513, [arXiv:1312.2547 \[hep-ph\]](#).
- [66] P. B. Denton and T. J. Weiler, “Using Integral Dispersion Relations to Extend the LHC Reach for New Physics,” *Phys. Rev.* **D89** no. 3, (2014) 035013, [arXiv:1311.1248 \[hep-ph\]](#).
- [67] N. Arsene, L. I. Caramete, P. B. Denton, and O. Micu, “Quantum Black Holes Effects on the Shape of Extensive Air Showers,” *Rom. Rep. Phys.* **69** (2017) 105, [arXiv:1310.2205 \[hep-ph\]](#).

## Conference Proceedings

- [1] **GRAND** Collaboration, R. Alves Batista *et al.*, “The Giant Radio Array for Neutrino Detection (GRAND) Collaboration – Contributions to the 38th International Cosmic Ray Conference (ICRC 2023),” in *38th International Cosmic Ray Conference*. 7, 2023. [arXiv:2308.00120 \[hep-ex\]](#).
- [2] **UHECR** Collaboration, F. Schroeder *et al.*, “Snowmass UHECR Whitepaper: Requirements on Future Instrumentation,” *PoS ICRC2023* (2023) 206.
- [3] **GRAND** Collaboration, K. Kotera, “The Giant Radio Array for Neutrino Detection (GRAND) Project,” 7, 2021. [arXiv:2108.00032 \[astro-ph.HE\]](#).
- [4] S. J. Parke, P. B. Denton, and H. Minakata, “Analytic Neutrino Oscillation Probabilities in Matter: Revisited,” [arXiv:1801.00752 \[hep-ph\]](#).
- [5] **JEM-EUSO** Collaboration, P. B. Denton, L. A. Anchordoqui, A. A. Berlind, M. Richardson, and T. J. Weiler, “Sensitivity of orbiting JEM-EUSO to large-scale cosmic-ray anisotropies,” *J.Phys.Conf.Ser.* **531** (2014) 012004, [arXiv:1401.5757 \[astro-ph.IM\]](#).

## Collaboration Papers

- [1] **DUNE** Collaboration, A. Abed Abud *et al.*, “DUNE Phase II: Scientific Opportunities, Detector Concepts, Technological Solutions,” [arXiv:2408.12725 \[physics.ins-det\]](#).

- [2] **GRAND** Collaboration, R. Alves Batista *et al.*, “GRANDlib: A simulation pipeline for the Giant Radio Array for Neutrino Detection (GRAND),” [arXiv:2408.10926 \[astro-ph.IM\]](#).
- [3] **DUNE** Collaboration, A. Abed Abud *et al.*, “First Measurement of the Total Inelastic Cross-Section of Positively-Charged Kaons on Argon at Energies Between 5.0 and 7.5 GeV,” [arXiv:2408.00582 \[hep-ex\]](#).
- [4] **DUNE** Collaboration, A. Abed Abud *et al.*, “Supernova Pointing Capabilities of DUNE,” [arXiv:2407.10339 \[hep-ex\]](#).
- [5] **DUNE** Collaboration, A. Abed Abud *et al.*, “Performance of a modular ton-scale pixel-readout liquid argon time projection chamber,” [arXiv:2403.03212 \[physics.ins-det\]](#).
- [6] **DUNE** Collaboration, A. Abed Abud *et al.*, “The DUNE Far Detector Vertical Drift Technology. Technical Design Report,” *JINST* **19** no. 08, (2024) T08004, [arXiv:2312.03130 \[hep-ex\]](#).
- [7] D. Ayzenberg *et al.*, “Fundamental Physics Opportunities with the Next-Generation Event Horizon Telescope,” [arXiv:2312.02130 \[astro-ph.HE\]](#).
- [8] **DUNE** Collaboration, A. Abed Abud *et al.*, “Impact of cross-section uncertainties on supernova neutrino spectral parameter fitting in the Deep Underground Neutrino Experiment,” *Phys. Rev. D* **107** no. 11, (2023) 112012, [arXiv:2303.17007 \[hep-ex\]](#).
- [9] **DUNE** Collaboration, A. Abed Abud *et al.*, “Highly-parallelized simulation of a pixelated LArTPC on a GPU,” *JINST* **18** no. 04, (2023) P04034, [arXiv:2212.09807 \[physics.comp-ph\]](#).
- [10] **FASER** Collaboration, H. Abreu *et al.*, “Technical Proposal: FASERnu,” [arXiv:2001.03073 \[physics.ins-det\]](#).
- [11] **FASER** Collaboration, H. Abreu *et al.*, “Detecting and Studying High-Energy Collider Neutrinos with FASER at the LHC,” *Eur. Phys. J.* **C80** no. 1, (2020) 61, [arXiv:1908.02310 \[hep-ex\]](#).
- [12] **GRAND** Collaboration, J. Álvarez Muñiz *et al.*, “The Giant Radio Array for Neutrino Detection (GRAND): Science and Design,” *Sci. China Phys. Mech. Astron.* **63** no. 1, (2020) 219501, [arXiv:1810.09994 \[astro-ph.HE\]](#).

## Talks (100 including 64 invited)

- [1] “NuFast: Fast and Accurate Algorithm for Calculating Long-Baseline Neutrino Oscillation Probabilities with Matter Effects.”



- <https://agenda.infn.it/event/39753/contributions/240076/>. **Invited** talk at NOW, Otranto Italy, August 2024.
- [2] “CP-Violation with Neutrino Disappearance and NuFast.”  
<https://indico.sanfordlab.org/event/69/timetable/#132-talk-dark-matter-raining-o>.  
**Invited** talk at the Center for Theoretical Underground Physics and Related Areas (CETUP\*) workshop, Lead SD, July 2023.
  - [3] “NuFast: Fast and Accurate Algorithm for Calculating Long-Baseline Neutrino Oscillation Probabilities with Matter Effects.”  
<https://indico.fnal.gov/event/60082/contributions/291412/>. Talk at DUNE Collaboration Meeting at Fermilab, May 2024.
  - [4] “CP Violation with Neutrino Disappearance.”. **Invited** seminar at Colorado State University, April 2024.
  - [5] “CP Violation with Neutrino Disappearance.”. **Invited** seminar at Colorado State University, March 2024.
  - [6] “CP Violation with Neutrino Disappearance.”  
<https://indico.bnl.gov/event/21760/>. Talk at the BNL HET Group, March 2024.
  - [7] “CP Violation with Neutrino Disappearance.”  
<https://indico.fnal.gov/event/63560/>. Talk at the DUNE LBL WG, March 2024.
  - [8] “Knowns and Unknowns in Neutrinos.”  
<https://web.mit.edu/lms/news/archives/index.html>. **Invited** colloquium at MIT, Boston, October 2023.
  - [9] “LMA-Dark: Large New Physics Effects in Neutrino Oscillations.”. **Invited** talk at the COHERENT collaboration, August 2023.
  - [10] “Testing Unitarity of the Leptonic Mixing Matrix with Oscillations: A Focus on Tau Neutrinos.” <https://ifirse.icise.vn/nugroup/nuworkshop2023/program.html>.  
**Invited** plenary at the 19th Rencontres du Vietnam, July 2023.
  - [11] “Light Sterile Neutrinos: A Modern Picture and a Model to Evade Cosmology.”  
<https://indico.ihep.ac.cn/event/18269/contributions/135575/>. **Invited** talk at WIN, July 2023.
  - [12] “Light Sterile Neutrinos: A Modern Picture and a Model to Evade Cosmology.”  
<https://indico.sanfordlab.org/event/53/contributions/822/>. **Invited** talk at the Center for Theoretical Underground Physics and Related Areas (CETUP\*) workshop, Lead SD, July 2023.



- [13] “Here Comes the Sun: Solar Parameters in Long-Baseline Accelerator Neutrino Oscillations.”  
<https://indico.cern.ch/event/1218225/contributions/5384272/>. Talk at Pheno, Pittsburgh, May 2023.
- [14] “Light Sterile Neutrinos: A Modern Picture and a Model to Evade Cosmology.”  
<https://indico.cern.ch/event/1258338/contributions/5307365/>. **Invited** talk at University of Cape Town, April 2023.
- [15] “Knowns and Unknowns in Neutrinos.”. **Invited** colloquium at University of Wisconsin, Madison, April 2023.
- [16] “Neutrinos at Snowmass.”. **Invited** seminar at Kings College London, January 2023.
- [17] “Knowns and Unknowns in Neutrinos.”. **Invited** colloquium at Stony Brook University, New York, October 2022.
- [18] “Light (Fermionic?) Dark Matter.”  
<https://indico.cern.ch/event/1189979/contributions/5012521/>. **Invited** talk at the International Conference on Neutrinos and Dark Matter in Egypt, October 2022.
- [19] “Connecting the Extremes: A Story of Supermassive Black Holes and Ultralight Dark Matter.”. **Invited** talk at Dark Matter in Compact Objects, Stars, and in Low Energy Experiments at INT, Seattle, August 2022.
- [20] “Tau Neutrinos: from GeV to EeV.”  
<https://indico.fnal.gov/event/22303/contributions/246362/>. **Invited** talk at Snowmass, Seattle, July 2022.
- [21] “Sterile neutrinos at 1 eV.”  
[https://www.mpi-hd.mpg.de/lin/seminar\\_theory.en.php](https://www.mpi-hd.mpg.de/lin/seminar_theory.en.php). **Invited** seminar at MPI Heidelberg, July 2022.
- [22] “Connecting the Extremes: Story of Supermassive Black Holes and Ultralight Dark Matter.” <https://n3as.berkeley.edu/p/event/su22-jun14/>. **Invited** seminar at UC Berkeley via N3AS, June 2022.
- [23] “Connecting the Extremes: Story of Supermassive Black Holes and Ultralight Dark Matter.” <https://theory.tifr.res.in/~sotu/previous.php>. **Invited** seminar at Tata Institute of Fundamental Research, India, June 2022.
- [24] “Flavor mixing, CP violation, and Unitarity.”  
[https://neutrino2022.org/program/detail\\_program](https://neutrino2022.org/program/detail_program). **Invited** plenary talk at Neutrino 2022, Seoul Korea, June 2022.
- [25] “CP Violation at Long-Baseline Neutrino Experiments.”  
<https://indico.cern.ch/event/1125426/contributions/4868720/>. **Invited** plenary talk at the Mitchell Conference on Collider, Dark Matter, and Neutrino Physics; Texas A&M, College Station TX, May 2022.

- [26] “Neutrino Theory Overview.”  
<https://indico.sanfordlab.org/event/28/contributions/310/>. **Invited**  
 plenary talk at the Conference on Science at the Sanford Underground Research  
 Facility (CoSSURF), May 2022.
- [27] “Nu physics: Theory and practice.”  
<https://indico.cern.ch/event/1089132/contributions/4863585/>. **Invited**  
 plenary talk at the Phenomenology Symposium, Pittsburgh, May 2022.
- [28] “CP Violation at Long-Baseline Neutrino Experiments.”  
[https://lawphysics.wordpress.com/2022/04/20/w131-peter-denton-cp-violation-at-long-](https://lawphysics.wordpress.com/2022/04/20/w131-peter-denton-cp-violation-at-long-baseline-neutrino-experiments/)  
**Invited** seminar in the Latin American Webinar Physics series, April 2022.
- [29] “CP Violation at Long-Baseline Neutrino Experiments.”. **Invited** seminar at  
 Harvard, April 2022.
- [30] “Connecting the Extremes: Story of Supermassive Black Holes and Ultralight Dark  
 Matter.”. **Invited** seminar at MIT, April 2022.
- [31] “New Perspectives on Atmospheric Neutrinos.”. **Invited** seminar at INFN Torino,  
 March 2022.
- [32] “Tau Neutrino Identification at IceCube for Unitary Violation Tests.”  
<https://indico.cern.ch/event/1103445/contributions/4724172/>. Talk at  
 Snowmass BSM neutrino workshop, February 2022.
- [33] “Neutrinos and Cosmic Rays at Snowmass.”  
<https://indico.bnl.gov/event/13887/>. Talk at BNL Snowmass Retreat,  
 December 2021.
- [34] “Astrophysical Neutrino Decay.”  
<https://indico.ipmu.jp/event/397/contributions/6390/>. **Invited** talk at Dark  
 Sectors of Astroparticle Physics at IPMU, Japan December 2021.
- [35] “Neutrino Oscillations at FPF.”  
<https://indico.cern.ch/event/1076733/contributions/4577119/>. Talk at  
 Third Forward Physics Facility October 2021.
- [36] “Astrophysical Neutrino Decay.”  
<https://indico.ific.uv.es/event/6178/contributions/15526/>. Talk at TAUP  
 August 2021.
- [37] “Astrophysical Neutrino Decay.”  
<https://indico.desy.de/event/28202/contributions/105961/>. Talk at  
 EPS-HEP July 2021.
- [38] “CP-Violating Neutrino Non-Standard Interactions in Long-Baseline-Accelerator  
 Data.” <https://indico.cern.ch/event/1034469/contributions/4430079/>. Talk  
 at DPF at FSU July 2021.

- [39] “CP-Violating Neutrino Non-Standard Interactions in Long-Baseline-Accelerator Data.” <https://indico.ibs.re.kr/event/357/timetable/>. Talk at PASCOS in IBS Koreas June 2021.
- [40] “CP-Violating Neutrino Non-Standard Interactions in Long-Baseline-Accelerator Data.” <https://indico.cern.ch/event/982783/contributions/4362341/>. Talk at Pheno May 2021.
- [41] “Neutrino Oscillations in Matter and Linear Algebra.”. **Invited** colloquium at Illinois Institute of Technology April 2021.
- [42] “CP Violation at Long-Baseline Neutrino Experiments.”. **Invited** seminar at Michigan State University March 2021.
- [43] “Astrophysical Neutrino Decay.” <https://agenda.infn.it/event/24250/contributions/129755/>. Talk at the XIX International Workshop on Neutrino Telescopes February 2021.
- [44] “CP Violation at Long-Baseline Neutrino Experiments.” <https://indico.cern.ch/event/1001277/>. **Invited** seminar at Sydney CPPC February 2021.
- [45] “Ultralight Fermionic Dark Matter.”. **Invited** talk at Asymptotic Safety and Dark Matter workshop at OSU December 2020.
- [46] “Ultralight Fermionic Dark Matter.” <https://www.ictp-saifr.org/dmw2020/>. Talk at 3rd South American Dark Matter Workshop at ICTP in Sao Paulo December 2020.
- [47] “3+1+NSI and CP Violation.”. **Invited** seminar at KIAS November 2020.
- [48] “CP Violation at Long-Baseline Neutrino Experiments.” <https://indico.bnl.gov/event/8008/>. Talk at BNL HET Group October 2020.
- [49] “CP Violation at Long-Baseline Neutrino Experiments.” <https://npc.fnal.gov/neutrino-seminar-series/>. **Invited** Neutrino Physics Center seminar October 2020 at Fermilab.
- [50] “The Lightest Dark Matter.”. **Invited** seminar October 2020 at University of Sussex.
- [51] “Astrophysical Neutrino Decay.” <https://indico.cern.ch/event/868940/contributions/3899680/>. Talk at ICHEP July 2020 in Prague (virtual).
- [52] “Visible Decay of Astrophysical Neutrinos.” <https://indico.bnl.gov/event/7985/>. Talk at BNL HET Group May 2020.
- [53] “Ultralight Boson Dark Matter Constraints from Superradiance Leveraging the Event Horizon Telescope Collaboration’s Observations of M87\*.” <https://indico.cern.ch/event/858682/contributions/3837326/>. Talk at Pheno May 2020 in Pittsburgh, PA (virtual).

- [54] “Beyond the Standard Model physics with accelerator neutrino experiments.”  
<https://aps-april.onlineeventpro.freeman.com/sessions/15336169/subsession/25117238/>  
**Invited** plenary at APS April Meeting 2020 (virtual).
- [55] “LMA-Dark: Large New Physics Effects in Neutrino Oscillations.”  
<https://indico.bnl.gov/event/7665/>. Talk at BNL HET Group February 2020.
- [56] “Motivation for neutrino precision in oscillations.”  
<https://indico.bnl.gov/event/7282/>. **Invited** talk at BNL Snowmass Intensity Frontier & Astrophysics Workshop February 2020.
- [57] “Recent results in neutrino oscillation theory.”  
<https://www.physics.umass.edu/events/2019-11-15-recent-results-neutrino-oscillation>  
**Invited** seminar at UMass Amherst November 2019.
- [58] “Realizing the physics goals at DUNE.”  
<https://indico.fnal.gov/event/21535/other-view>. **Invited** talk at Modules Of Opportunity for DUNE workshop at BNL November 2019.
- [59] “Recent results in neutrino oscillation theory.”  
<https://physics.osu.edu/events/high-energy-physics-seminar-peter-dentonbrookhaven>  
**Invited** seminar at OSU November 2019.
- [60] “New physics probes in future neutrino experiments.”  
<https://indico.bnl.gov/event/6652/>. **Invited** colloquium at BNL October 2019.
- [61] “Recent results in neutrino oscillation theory.”  
<https://indico.cern.ch/event/800930/contributions/3557081/>. Talk at CERN Neutrino Platform October 2019.
- [62] “Neutrino theory in the coming years.” <https://indico.bnl.gov/event/6710/>.  
**Invited** talk at BNL Snowmass Discussion October 2019.
- [63] “Recent results in neutrino oscillation theory.”  
<https://theory.fnal.gov/events/event/tbd-neutrinos/>. **Invited** theory seminar at Fermilab September 2019.
- [64] “Exact neutrino oscillation probabilities in matter.”  
<https://indico.ific.uv.es/event/3649/contributions/11349/>. Talk given at TomFest at Vanderbilt August 2019.
- [65] “Neutrino oscillation probabilities in matter.”  
<https://indico.cern.ch/event/782953/contributions/3444777/>. Talk given at the 2019 DPF meeting at Northeastern July 2019.
- [66] “Neutrino self interactions in the early universe.”  
<https://indico.cern.ch/event/812851/contributions/3432032/>. **Invited** talk at NTN NSI Workshop at Wash U May 2019.

- [67] “Partial neutrino decay resolves icecube’s track and cascade tension.”  
<https://indico.bnl.gov/event/5875/>. Talk at BNL HET Group May 2019.
- [68] “Neutrino Oscillation Probabilities in Matter.”  
<http://theory.physics.uci.edu/seminars.html>. **Invited** seminar at UC Irvine May 2019.
- [69] “Neutrino Oscillation Probabilities in Matter.”  
<http://www.theory.caltech.edu/people/carol/seminar.html>. Seminar at Caltech May 2019.
- [70] “Partial Neutrino Decay Addresses the Track – Cascade Tension at IceCube.”  
<https://indico.cern.ch/event/777988/contributions/3410555/>. Talk at Pheno May 2019 in Pittsburgh, PA.
- [71] “Neutrino Oscillation Probabilities in Matter.”  
<https://www.phys.psu.edu/seminars/all-seminars>. **Invited** seminar at Penn State April 2019.
- [72] “Neutrino Oscillation Probabilities in Matter.”  
<https://www.phys.vt.edu/Talks/NeutrinoPhysicsSeminar.html>. **Invited** seminar at Virginia Tech February 2019.
- [73] “Analytic and Compact Expressions for Neutrino Oscillations in Matter.”  
<https://dx.doi.org/10.5281/zenodo.2642372>. **Invited** talk at PONDD workshop at Fermilab December 2018.
- [74] “Finding the Unexpected in IceCube.”. **Invited** N-Talk at Niels Bohr International Academy September 2018 in Copenhagen.
- [75] “High Energy Neutrino Parameter Estimation.”. **Invited** talk at GRAND workshop at IAP August 2018.
- [76] “New Neutrino Interactions: Breaking Degeneracies and Relaxing Sterile Tensions.”. **Invited** seminar at BNL August 2018.
- [77] “Analytic and compact perturbative expressions for neutrino oscillations in matter.”  
<https://indico.cern.ch/event/686555/contributions/2977525/>. Talk at the International Conference of High Energy Physics (ICHEP) July 2018 in Seoul.
- [78] “Gamma Ray Bursts, Supernovae, Neutrinos, and IceCube.”. **Invited** talk at IIHE April 2018 in Brussels.
- [79] “Gamma Ray Bursts, Supernovae, Neutrinos, and IceCube.”. **Invited** talk at DESY January 2018 in Zeuthen.
- [80] “Gamma Ray Bursts, Supernovae, Neutrinos, and IceCube.”. **Invited** talk at Arizona State University January 2018.

- [81] “Supernova - Gamma Ray Burst - Neutrino Connection.”. **Invited** SUPER-STARs talk at DARK Cosmology Center November 2017 in Copenhagen.
- [82] “Gamma Ray Bursts, Supernovae, Neutrinos, and IceCube.”. **Invited** N-Talk at Niels Bohr International Academy November 2017 in Copenhagen.
- [83] “Analytic and compact perturbative expressions for neutrino oscillations in matter.”. **Invited** seminar at Campinas State University October 2017.
- [84] “COHERENT and the LMA-Dark NSI Solution.”  
<https://indico.uu.se/event/324/session/20/contribution/182>. **Invited** talk at the NUFACT 2017 workshop September 2017 in Uppsala.
- [85] “What We Can Tell About the Sources of IceCube’s Neutrinos, and What IceCube Can Tell Us About Gamma Ray Bursts.”  
<http://astro.fnal.gov/events/event/tbd-35/>. Astrophysics theory seminar at Fermilab August 2017 in Batavia, IL.
- [86] “The Galactic Contribution to IceCube’s Astrophysical Neutrino Flux.”  
<https://indico.cern.ch/event/615891/contributions/2608935/>. Talk at TeV Particle Astrophysics at CCAPP in Columbus, OH.
- [87] “Finding Anisotropies in Cosmic Rays and Neutrinos.”  
<http://nbia.nbi.ku.dk/nbia-seminars/nbia-seminar-peter-denton/>. **Invited** seminar at the Niels Bohr International Academy astroparticle seminar April 2017 in Copenhagen.
- [88] “Analytic and compact perturbative expressions for neutrino oscillations in matter.”. Talk at the Center of Excellence for Particle Physics at the Terascale at the University of Melbourne December 2016.
- [89] “Spherical Harmonics as a Tool for Finding Anisotropies in UHECR and Astrophysical Neutrino Fluxes.”. **Invited** talk at the Danish Astroparticle Physics Meeting October 2016 in Odense.
- [90] “The Standard Neutrino Oscillation Parameters and a Surprising Alternative Solution.”. **Invited** N-Talk at Niels Bohr International Academy September 2016 in Copenhagen.
- [91] “Analytic and compact perturbative expressions for neutrino oscillations in matter.”  
<http://indico.cern.ch/event/432527/contributions/1071859/>. Talk at the International Conference of High Energy Physics (ICHEP) August 2016 in Chicago, IL.
- [92] “Analytic and compact perturbative expressions for neutrino oscillations in matter.”  
<http://theory.fnal.gov/seminars/seminars.html>. **Invited** talk at the Fermilab theory seminar July 2016 in Batavia, IL.

- [93] “Methods for Probing New Physics at High Energies.”  
<https://events.vanderbilt.edu/index.php?eID=90084>. Successful dissertation defense at Vanderbilt University June 2016 in Nashville, TN.
- [94] “Analytic and compact perturbative expressions for neutrino oscillations in matter.”  
<http://www.ccsem.infn.it/issp2016/index.html>. Talk at the International School of Subnuclear Physics May 2016 in Erice, Sicily.
- [95] “Analytic and compact perturbative expressions for neutrino oscillations in matter.”  
<https://indico.cern.ch/event/489180/contributions/2158195/>. Talk at Pheno May 2016 in Pittsburgh, PA.
- [96] “Cosmic Ray Anisotropy with Partial Sky Exposure.”. **Invited** seminar November 2015 at CCAPP.
- [97] “The Effect of a Maximum Lepton Energy on the Stability of Pions and Cosmic Ray Physics.” <http://meetings.aps.org/link/BAPS.2015.APR.M14.1>. Talk at the APS April meeting 2015 in Baltimore, MD.
- [98] “Particle Physics at the Highest Energies.”. **Invited** seminar December 2014 at the University of Wisconsin – Madison.
- [99] “Sensitivity of orbiting JEM-EUSO to large-scale cosmic-ray anisotropies.”. Talk at the Cosmic Ray Anisotropy Workshop September 2013 in Madison, WI.
- [100] “Using dispersion relations to look for new physics in pp elastic scattering at the LHC.” <http://meetings.aps.org/link/BAPS.2013.APR.H12.8>. Talk at the APS April meeting 2013 in Denver, CO.

## Lectures

- [1] “Neutrino Oscillations and Theory Biases.”. Lecture for students at the CETUP workshop in Lead SD, July 2023.
- [2] “Neutrino Oscillations and Theory Biases.”  
<https://indico.bnl.gov/event/19465/timetable/>. Lecture for students at BNL, June 2023.
- [3] “Neutrino Oscillations and Theory Biases.”  
<https://indico.bnl.gov/event/15829/timetable/>. Lecture for students at BNL, June 2022.
- [4] “Neutrino Oscillations.”. Two lectures for undergraduates at TIFR, May 2021.

## Notes

- [1] P. B. Denton, H. Minakata, and S. J. Parke, “Comment on 1801.10488v3,”  
<https://zenodo.org/record/1177535>.



## Code

- [1] P. B. Denton, “Peterdenton/nu-pert-compare: v1.0.0,” Jan., 2019.  
<https://doi.org/10.5281/zenodo.2547029>.  
<https://github.com/PeterDenton/Nu-Pert-Compare>.
- [2] P. B. Denton, “ANA v1.0.0: Astrophysical Neutrino Anisotropy,” Mar., 2017.  
<https://doi.org/10.5281/zenodo.438675>.  
<https://github.com/PeterDenton/ANA>.
- [3] P. B. Denton, “Nu-Pert v0.2.2: Analytic and compact perturbative expressions for neutrino oscillations in matter,” June, 2016.  
<https://doi.org/10.5281/zenodo.54629>.  
<https://github.com/PeterDenton/Nu-Pert>.

## Miscellaneous

- [1] P. B. Denton\* *et al.*, “Neutrino Non-Standard Interactions.” Snowmass 2021: LOI, August, 2020.  
[https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF3\\_NF1-CF7\\_CF0-TF11\\_](https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF3_NF1-CF7_CF0-TF11_)  
\*Editor.
- [2] P. B. Denton\* and S. J. Parke, “Direct Probes of the Matter Effect in Neutrino Oscillations.” Snowmass 2021: LOI, August, 2020.  
[https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF1\\_NF3-TF0\\_TF0\\_Peter](https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF1_NF3-TF0_TF0_Peter)  
\*Editor.
- [3] M. Bustamante\*, P. B. Denton\*, S. Wissel\*, *et al.*, “Ultra-High-Energy Neutrinos.” Snowmass 2021: LOI, August, 2020.  
[https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF4\\_NF6-CF7\\_CF3-TF9\\_T](https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF4_NF6-CF7_CF3-TF9_T)  
\*Editor.
- [4] P. B. Denton\* *et al.*, “Computing Neutrino Oscillations in Matter Efficiently.” Snowmass 2021: LOI, July, 2020.  
<https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF8-CompF2-005.pdf>.  
\*Editor.
- [5] L. A. Anchordoqui, M. Bustamante, *et al.*, “Cosmic Neutrino Probes of Fundamental Physics.” Snowmass 2021: LOI, August, 2020.  
[https://www.snowmass21.org/docs/files/summaries/CF/SNOWMASS21-CF7\\_CF1-NF4\\_NF3-TF11\\_](https://www.snowmass21.org/docs/files/summaries/CF/SNOWMASS21-CF7_CF1-NF4_NF3-TF11_)
- [6] L. A. Anchordoqui *et al.*, “Synergy of astro-particle physics and collider physics.” Snowmass 2021: LOI, August, 2020.  
[https://www.snowmass21.org/docs/files/summaries/CF/SNOWMASS21-CF7\\_CF0-EF6\\_EF7-NF5\\_M](https://www.snowmass21.org/docs/files/summaries/CF/SNOWMASS21-CF7_CF0-EF6_EF7-NF5_M)
- [7] D. Soldin *et al.*, “Studies of the Muon Excess in Cosmic Ray Air Showers.” Snowmass 2021: LOI, August, 2020.  
[https://www.snowmass21.org/docs/files/summaries/CF/SNOWMASS21-CF7\\_CF0-EF6\\_EF7-AF4\\_A](https://www.snowmass21.org/docs/files/summaries/CF/SNOWMASS21-CF7_CF0-EF6_EF7-AF4_A)

- [8] J. L. Feng, F. Kling, *et al.*, “Forward Physics Facility.” Snowmass 2021: LOI, August, 2020.  
[https://www.snowmass21.org/docs/files/summaries/EF/SNOWMASS21-EF9\\_EF6\\_EF10\\_EF5-NF6\\_](https://www.snowmass21.org/docs/files/summaries/EF/SNOWMASS21-EF9_EF6_EF10_EF5-NF6_)
- [9] L. Johns *et al.*, “Supernova neutrinos and particle-physics opportunities.” Snowmass 2021: LOI, August, 2020.  
[https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF8\\_NF4-CF3\\_CF7-TF9\\_T](https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF8_NF4-CF3_CF7-TF9_T)
- [10] K. Scholberg *et al.*, “Neutrino Opportunities at the ORNL Second Target Station.” Snowmass 2021: LOI, August, 2020.  
[https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF6\\_NF9-CF1\\_CF0-TF11\\_](https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF6_NF9-CF1_CF0-TF11_)
- [11] M. Hostert *et al.*, “Opportunities and signatures of non-minimal Heavy Neutral Leptons.” Snowmass 2021: LOI, August, 2020.  
[https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF2\\_NF3-EF9\\_EF0-RF4\\_R](https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF2_NF3-EF9_EF0-RF4_R)
- [12] D. A. Sierra *et al.*, “Coherent elastic neutrino-nucleus scattering: Theoretical and experimental impact.” Snowmass 2021: LOI, May, 2020.  
<https://www.snowmass21.org/docs/files/summaries/NF/SNOWMASS21-NF0-002.pdf>.

## Thesis

- [1] P. B. Denton, *Methods for Probing New Physics at High Energies*. PhD thesis, Vanderbilt U., 2016-12-18. <https://ir.vanderbilt.edu/handle/1803/12817>.