Julian Heeck

University of Virginia
Department of Physics
P.O. Box 400714
Charlottesville, VA 22904

heeck@virginia.edu
https://uva.theopenscholar.com/julian-heeck
ORCID ID: 0000-0003-2653-5962
INSPIRE Profile: J.Heeck.1

Academic Career and Education

07/2020–present **Assistant Professor**, *Department of Physics, University of Virginia, USA*.

10/2018–07/2020 **Assistant Project Scientist**, *University of California, Irvine, USA*.

10/2014–10/2018 **Postdoc**, *Université Libre de Bruxelles, Belgium*.

06/2014–10/2014 **Postdoc**, *Heidelberg University, Germany*.

2011–2014 **Ph.D.**, *Max Planck Institute for Nuclear Physics & Heidelberg University, Germany*, Advisor: *Dr. Werner Rodejohann*. Grade: 1.0 (summa cum laude).

2007–2011 **Diplom (Master of Science, Physics)**, *Heidelberg University, Germany*.

2005–2007 **Vordiplom (Bachelor of Science, Physics)**, *RWTH Aachen University, Germany*.

Honors, Awards, Grants, and Fellowships

2024 Ignite Scholar, Center for Teaching Excellence, University of Virginia.

2024–present Grant from United States' **Department of Energy**, *DE-SC0007974*.

2023 **Adolphe Wetrems Prize** of the Royal Academies for Science and the Arts of Belgium.

2023–present 4-VA at UVA Collaborative Research Grant.

2022–2024 Continuing Grant from United States' **National Science Foundation**, *PHYS-2210428*.

2022–2023 Oak Ridge Associated Universities' Ralph E. Powe Junior Faculty Enhancement Award.

2022–2023 Academic host for Feodor Lynen Research Fellow *Jan Heisig*.

2018–2020 Feodor Lynen Research Fellowship of the **Alexander von Humboldt Foundation**.

2018 Outstanding Referee, *Nucl. Phys. B* and *Phys. Lett. B*.

2016 Selected to participate in the Lindau Nobel Laureate Meeting, supported by FNRS.

2015–2018 Chargé de Recherches fellowship from the **Fonds de la Recherche Scientifique** - FNRS.

2014 **Otto Hahn Medal**, for exceptional contributions to models beyond the SM, awarded by the Max Planck Society for outstanding scientific achievements by junior scientists.

Academic and Professional Service

2023 Invited member of the "Dark Matter and Dark Energy" panel of the National Science Foundation at *Awesome Con* in Washington, D.C.

2022 Member of international organizing committee for "4th International Conference on Charged Lepton Flavor Violation" in Heidelberg, Germany.

2020–2022 Member of Mu2e-II Snowmass 21 committee and convener of theory working group.

2020–2022 Convener of topical **Snowmass 21** group "More exotic L and B violating processes" within the "Rare Processes and Precision" frontier.

2019 Convener of Baryon Number Violation session of the 2019 "International Workshop on Baryon and Lepton Number Violation" in Madrid, October 21–24, 2019.

2020–present **Grant reviewer** for the *Austrian Science Fund*, the German *Alexander von Humboldt Foundation*, Chile's *National Agency for Research and Development*, the United States' *Department of Energy* and *National Science Foundation*, and the *4-VA Collaborative*.

2014–present **Referee** for *Phys. Rev. Lett.*, *Phys. Rev. D*, *Nucl. Phys. B*, *Phys. Lett. B*, *J. Phys. G*, *Eur. Phys. J. C*, *EPL (Europhys. Lett.)*, *Particles*, *JHEP*, *JCAP*, and *Springer Nature*.

Selected Media

2021 **Stars made of antimatter could lurk in the Milky Way**, *ScienceNews, June 5*.
www.sciencenews.org/article/antimatter-stars-antistars-milky-way-galaxy-space-astronomy

2019 **Wieviel wiegt ein Photon?**, *Physik in unserer Zeit, March 3, 2019*.
doi.org/10.1002/piuz.201970211 (in German)

2017 **NEMO-3 hunts for ultra-rare beta decay**, *Physics World*.
physicsworld.com/cws/article/news/2017/jun/30/nemo-3-hunts-for-ultra-rare-beta-decay

2013 **Live long**, *Nature Physics Research Highlights*.
www.nature.com/articles/nphys2726

2013 **Big Bang Light Reveals Minimum Lifetime of Photons**, *Scientific American*.
www.scientificamerican.com/article/big-bang-light-reveals-lifetime-photon

2013 **What is the lifetime of a photon?**, *Physics World, July 24, 2013*.
physicsworld.com/a/what-is-the-lifetime-of-a-photon

2013 **Photonen zerfallen frühestens nach drei Jahren**, *Spektrum, July 17, 2013*.
spektrum.de/news/photonen-zerfallen-fruehestens-nach-drei-jahren/1201316 (in German)

Teaching

Spring 2025 **Elementary Particle Physics**, *Lectures*, University of Virginia.

Fall 2024 **Classical Mechanics**, *Lectures*, University of Virginia.

Fall 2023 **Theoretical Mechanics**, *Lectures*, University of Virginia.

Summer 2023 **Neutrinos in the Standard Model**, *Summer School Lectures*, Fermilab.

Spring 2023 **Introduction to the Theory of General Relativity**, *Lectures*, University of Virginia.

Fall 2022 **Theoretical Mechanics**, *Lectures*, University of Virginia.

Spring 2022 **Introduction to the Theory of General Relativity**, *Lectures*, University of Virginia.

Fall 2021 **Theoretical Mechanics**, *Lectures*, University of Virginia.

Spring 2021 **Introduction to the Theory of General Relativity**, *Lectures*, University of Virginia.

Winter 2016 **Physics beyond the Standard Model**, *Tutorials*, Université Libre de Bruxelles.

Summer 2013 **The Standard Model**, *Tutorials*, Heidelberg University.

Summer 2012 **The Standard Model**, *Tutorials*, Heidelberg University.

Summer 2010 **Theoretical Quantum Mechanics**, *Tutorials*, Heidelberg University.

Summer 2009 **Theoretical Mechanics II**, *Tutorials*, Heidelberg University.

Winter 2008 **Theoretical Mechanics I**, *Tutorials*, Heidelberg University.

Summer 2008 **Theoretical Electrodynamics**, *Tutorials*, Heidelberg University.

Publications

The authors are listed in alphabetical order following standard conventions in this field.
A full list (incl. proceedings) can be found at INSPIRE under https://inspirehep.net/authors/1078238.
Summary (inspirehep.net, 1/2025): 66 peer-reviewed publications (5 in PRL), $\sim$ 4800 citations, **h-index: 33**.

69. J. Heeck and D. Watkins,
Baryon number violation involving tau leptons,
JHEP **07**, 170 (2024) [arXiv:2405.18478 [hep-ph]].

68. T. Blažek, J. Heeck, J. Heisig, P. Maták, and V. Zaujec,
Dirac leptogenesis from asymmetry wash-in via scatterings,
Phys. Rev. D **110**, 055042 (2024) [arXiv:2404.16934 [hep-ph]].

67. J. Heeck and M. Sokhashvili,
Lepton flavor violation by two units,
Phys. Lett. B **852**, 138621 (2024) [arXiv:2401.09580 [hep-ph]].

66. P. S. B. Dev, J. Heeck, and A. Thapa,
Neutrino mass models at μTRISTAN,
Eur. Phys. J. C **84**, 148 (2024) [arXiv:2309.06463 [hep-ph]].

65. J. R. Espinosa, J. Heeck, and M. Sokhashvili,
The Tunneling Potential Approach to Q-Balls,
Phys. Rev. D **108**, 056019 (2023) [arXiv:2307.05667 [hep-ph]].

64. J. Heeck, J. Heisig, and A. Thapa,
Testing Dirac leptogenesis with the cosmic microwave background and proton decay,
Phys. Rev. D **108**, 035014 (2023) [arXiv:2304.09893 [hep-ph]].

63. J. Heeck and A. Thapa,
Zee-model predictions for lepton flavor violation,
Phys. Lett. B **841**, 137910 (2023) [arXiv:2303.13383 [hep-ph]].

62. J. Heeck and M. Sokhashvili,
Revisiting the Friedberg-Lee-Sirlin soliton model,
Eur. Phys. J. C **83**, 526 (2023) [arXiv:2303.09566 [hep-ph]].

61. Y. Almumin, J. Heeck, A. Rajaraman, and C. B. Verhaaren,
Slowly rotating Q-balls,
Eur. Phys. J. C **84**, 364 (2024) [arXiv:2302.11589 [hep-th]].

60. J. Heeck, J. Heisig, and A. Thapa,
Dark matter and radiative neutrino masses in conversion-driven scotogenesis,
Phys. Rev. D **107**, 015028 (2023) [arXiv:2211.13013 [hep-ph]].

59. J. Heeck and M. Sokhashvili,
Q-balls in polynomial potentials,
Phys. Rev. D **107**, 016006 (2023) [arXiv:2211.00021 [hep-ph]].

58. J. Butterworth, J. Heeck, S. H. Jeon, O. Mattelaer, and R. Ruiz,
Testing the scalar triplet solution to CDF's heavy W problem at the LHC,
Phys. Rev. D **107**, 075020 (2023) [arXiv:2210.13496 [hep-ph]].

57. S. Davidson, B. Echenard, R. H. Bernstein, J. Heeck, and D. G. Hitlin,
Charged Lepton Flavor Violation,
Snowmass Community Study, arXiv:2209.00142 [hep-ex].

56. P. Fileviez Perez, A. Pocar, K. S. Babu, L. J. Broussard, V. Cirigliano, S. Gardner, J. Heeck, *et al.*
On Baryon and Lepton Number Violation,
Snowmass Community Study, arXiv:2208.00010 [hep-ph].

55. J. Heeck,
W-boson mass in the triplet seesaw model,
Phys. Rev. D **106**, 015004 (2022) [arXiv:2204.10274 [hep-ph]].

54. T. A. Chowdhury, J. Heeck, A. Thapa, and S. Saad,
W-boson mass shift and muon magnetic moment in the Zee model,
Phys. Rev. D **106**, 035004 (2022) [arXiv:2204.08390 [hep-ph]].

53. K. Byrum, S. Corrodi, Y. Oksuzian, P. Winter, J. Heeck, *et al.*,
Mu2e-II: Muon to electron conversion with PIP-II,
Snowmass Community Study, arXiv:2203.07569 [hep-ex].

52. J. Heeck, R. Szafron, and Y. Uesaka,
Isotope dependence of muon-to-electron conversion,
Nucl. Phys. B **980**, 115833 (2022) [arXiv:2203.00702 [hep-ph]].

51. J. Heeck and A. Thapa,
Explaining lepton-flavor non-universality and self-interacting dark matter with $L_\mu - L_\tau$,
Eur. Phys. J. C **82**, 480 (2022) [arXiv:2202.08854 [hep-ph]].

50. Y. Almumin, J. Heeck, A. Rajaraman, and C. B. Verhaaren,
Excited Q-Balls,
Eur. Phys. J. C **82**, 801 (2022) [arXiv:2112.00657 [hep-th]].

49. J. Heeck, R. Szafron, and Y. Uesaka,
Isotope dependence of muon decay in orbit,
Phys. Rev. D **105**, 053006 (2022) [arXiv:2110.14667 [hep-ph]].

48. J. Heeck, A. Rajaraman, R. Riley, and C. B. Verhaaren,
Proca Q-balls and Q-shells,
JHEP **10**, 103 (2021) [arXiv:2107.10280 [hep-th]].

47. J. Heeck, A. Rajaraman, and C. B. Verhaaren,
Ubiquity of gauged Q-shells,
Phys. Rev. D **104**, 016030 (2021) [arXiv:2105.02893 [hep-th]].

46. J. Heeck, A. Rajaraman, R. Riley, and C. B. Verhaaren,
Mapping Gauged Q-Balls,
Phys. Rev. D **103**, 116004 (2021) [arXiv:2103.06905 [hep-th]].

45. J. Heeck, A. Rajaraman, R. Riley, and C. B. Verhaaren,
Understanding Q-Balls Beyond the Thin-Wall Limit,
Phys. Rev. D **103**, 045008 (2021) [arXiv:2009.08462 [hep-th]].

44. J. Heeck,
Light particles with baryon and lepton numbers,
Phys. Lett. B **813**, 136043 (2021) [arXiv:2009.01256 [hep-ph]].

43. J. Heeck and V. Takhistov,
Inclusive Nucleon Decay Searches as a Frontier of Baryon Number Violation,
Phys. Rev. D **101**, 015005 (2020) [arXiv:1910.07647 [hep-ph]].

42. J. Heeck and H. H. Patel,
The Majoron at two loops,
Phys. Rev. D **100**, 095015 (2019) [arXiv:1909.02029 [hep-ph]].

41. K. Abazajian and J. Heeck,
Observing Dirac neutrinos in the cosmic microwave background,
Phys. Rev. D **100**, 075027 (2019) [arXiv:1908.03286 [hep-ph]].

40. R. Garani and J. Heeck,
Dark matter interactions with muons in neutron stars,
Phys. Rev. D **100**, 035039 (2019) [arXiv:1906.10145 [hep-ph]].

39. J. Heeck and A. Rajaraman,
How to produce antinuclei from dark matter,
J. Phys. G **47**, 105202 (2020) [arXiv:1906.01667 [hep-ph]].

38. J. Heeck, M. Lindner, W. Rodejohann, and S. Vogl,
Non-Standard Neutrino Interactions and Neutral Gauge Bosons,
SciPost Phys. **6**, 038 (2019) [arXiv:1812.04067 [hep-ph]].

37. S. Ferrari, T. Hambye, J. Heeck, and M. H. G. Tytgat,
$SO(10)$ *paths to dark matter,*
Phys. Rev. D **99**, 055032 (2019) [arXiv:1811.07910 [hep-ph]].

36. G. Arcadi, J. Heeck, F. Heizmann, S. Mertens, F. S. Queiroz, W. Rodejohann, M. Slezák, and K. Valerius,
Tritium beta decay with additional emission of new light bosons,
JHEP **1901**, 206 (2019) [arXiv:1811.03530 [hep-ph]].

35. J. Heeck and D. Teresi,
Pati-Salam explanations of the B-meson anomalies,
JHEP **1812**, 103 (2018) [arXiv:1808.07492 [hep-ph]].

34. T. Hambye and J. Heeck,
Proton decay into charged leptons,
Phys. Rev. Lett. **120**, 171801 (2018) [arXiv:1712.04871 [hep-ph]].

33. A. Crivellin, J. Heeck, and D. Müller,
Large $h \to bs$ *in generic two-Higgs-doublet models,*
Phys. Rev. D **97**, 035008 (2018) [arXiv:1710.04663 [hep-ph]].

32. J. Heeck and W. Rodejohann,
Lepton Flavor Violation with Displaced Vertices,
Phys. Lett. B **776**, 385 (2018) [arXiv:1710.02062 [hep-ph]].

31. S. Boulebnane, J. Heeck, A. Nguyen, and D. Teresi,
Cold light dark matter in extended seesaw models,
JCAP **1804**, 006 (2018) [arXiv:1709.07283 [hep-ph]].

30. J. Heeck and D. Teresi,
Cold keV dark matter from decays and scatterings,
Phys. Rev. D **96**, 035018 (2017) [arXiv:1706.09909 [hep-ph]].

29. C. Garcia-Cely and J. Heeck,
Neutrino Lines from Majoron Dark Matter,
JHEP **1705**, 102 (2017) [arXiv:1701.07209 [hep-ph]].

28. J. Heeck,
Interpretation of Lepton Flavor Violation,
Phys. Rev. D **95**, 015022 (2017) [arXiv:1610.07623 [hep-ph]].

27. J. Heeck and D. Teresi,
Leptogenesis and neutral gauge bosons,
Phys. Rev. D **94**, 095024 (2016) [arXiv:1609.03594 [hep-ph]].

26. Y. Farzan and J. Heeck,
Neutrinophilic nonstandard interactions,
Phys. Rev. D **94**, 053010 (2016) [arXiv:1607.07616 [hep-ph]].

25. C. Garcia-Cely and J. Heeck,
Indirect searches of dark matter via polynomial spectral features,
JCAP **1608**, 023 (2016) [arXiv:1605.08049 [hep-ph]].

24. M. Drewes, T. Lasserre, A. Merle, S. Mertens, J. Heeck *et al.*,
A White Paper on keV Sterile Neutrino Dark Matter,
JCAP **1701**, 025 (2017) [arXiv:1602.04816 [hep-ph]].

23. J. Heeck,
Lepton flavor violation with light vector bosons,
Phys. Lett. B **758**, 101 (2016) [arXiv:1602.03810 [hep-ph]].

22. C. Garcia-Cely and J. Heeck,
Phenomenology of left-right symmetric dark matter,
JCAP **1603**, 021 (2016) [arXiv:1512.03332 [hep-ph]].

21. A. Crivellin, J. Heeck, and P. Stoffer,
A perturbed lepton-specific two-Higgs-doublet model facing experimental hints for physics beyond the Standard Model,
Phys. Rev. Lett. **116**, 081801 (2016) [arXiv:1507.07567 [hep-ph]].

20. J. Heeck and S. Patra,
Minimal Left-Right Symmetric Dark Matter,
Phys. Rev. Lett. **115**, 121804 (2015) [arXiv:1507.01584 [hep-ph]].

19. J. M. Frère and J. Heeck,
Scalar glueballs: Constraints from the decays into η or η',
Phys. Rev. D **92**, 114035 (2015) [arXiv:1506.04766 [hep-ph]].

18. J. M. Frère, J. Heeck, and S. Mollet,
Triangle Inequalities for Majorana-Neutrino Magnetic Moments,
Phys. Rev. D **92**, 053002 (2015) [arXiv:1506.02964 [hep-ph]].

17. A. Crivellin, G. D'Ambrosio, and J. Heeck,
Addressing the LHC flavor anomalies with horizontal gauge symmetries,
Phys. Rev. D **91**, 075006 (2015) [arXiv:1503.03477 [hep-ph]].

16. A. Crivellin, G. D'Ambrosio, and J. Heeck,
Explaining $h \to \mu^\pm\tau^\mp$, $B \to K^*\mu^+\mu^-$ and $B \to K\mu^+\mu^-/B \to Ke^+e^-$ in a two-Higgs-doublet model with gauged $L_\mu - L_\tau$,
Phys. Rev. Lett. **114**, 151801 (2015) [arXiv:1501.00993 [hep-ph]].

15. J. Heeck, M. Holthausen, W. Rodejohann, and Y. Shimizu,
Higgs $\to \mu\tau$ in abelian and non-abelian flavor symmetry models,
Nucl. Phys. B **896**, 281 (2015) [arXiv:1412.3671 [hep-ph]].

14. J. Heeck,
Unbroken $B - L$ symmetry,
Phys. Lett. B **739**, 256 (2014) [arXiv:1408.6845 [hep-ph]].

13. J. Barry, J. Heeck, and W. Rodejohann,
Sterile neutrinos and right-handed currents in KATRIN,
JHEP **1407**, 081 (2014) [arXiv:1404.5955 [hep-ph]].

12. J. Heeck,
Leptogenesis with lepton-number-violating Dirac neutrinos,
Phys. Rev. D **88**, 076004 (2013) [arXiv:1307.2241 [hep-ph]].

11. J. Heeck and W. Rodejohann,
Neutrinoless quadruple beta decay,
Europhys. Lett. **103**, 32001 (2013) [arXiv:1306.0580 [hep-ph]].

10. J. Heeck,
How stable is the photon?,
Phys. Rev. Lett. **111**, 021801 (2013) [arXiv:1304.2821 [hep-ph]].

9. J. Heeck and W. Rodejohann,
Sterile neutrino anarchy,
Phys. Rev. D **87**, 037301 (2013) [arXiv:1211.5295 [hep-ph]].

8. J. Heeck and H. Zhang,
Exotic charges, multicomponent dark matter and light sterile neutrinos,
JHEP **1305**, 164 (2013) [arXiv:1211.0538 [hep-ph]].

7. J. Heeck,
Seesaw parametrization for n right-handed neutrinos,
Phys. Rev. D **86**, 093023 (2012) [arXiv:1207.5521 [hep-ph]].

6. T. Araki, J. Heeck, and J. Kubo,
Vanishing minors in the neutrino mass matrix from abelian gauge symmetries,
JHEP **1207**, 083 (2012) [arXiv:1203.4951 [hep-ph]].

5. J. Heeck and W. Rodejohann,
Neutrino hierarchies from a gauge symmetry,
Phys. Rev. D **85**, 113017 (2012) [arXiv:1203.3117 [hep-ph]].

4. J. Heeck and W. Rodejohann,
"Hidden" $O(2)$ and $SO(2)$ symmetry in lepton mixing,
JHEP **1202**, 094 (2012) [arXiv:1112.3628 [hep-ph]].

3. J. Heeck and W. Rodejohann,
Kinetic and mass mixing with three abelian groups,
Phys. Lett. B **705**, 369 (2011) [arXiv:1109.1508 [hep-ph]].

2. J. Heeck and W. Rodejohann,
Gauged $L_\mu - L_\tau$ symmetry at the electroweak scale,
Phys. Rev. D **84**, 075007 (2011) [arXiv:1107.5238 [hep-ph]].

1. J. Heeck and W. Rodejohann,
Gauged $L_\mu - L_\tau$ and different muon neutrino and anti-neutrino oscillations: MINOS and beyond,
J. Phys. G **38**, 085005 (2011) [arXiv:1007.2655 [hep-ph]].

Selected Talks

51. 9th DISCRETE Symposium, Ljubljana, Slovenia, December 2–6, 2024,
Invited plenary talk: *Baryon Number Violation Involving Tau Leptons*.

50. Theory Seminar, University of Pittsburgh, USA, November 7, 2024,
The landscape of baryon number violation.

49. 91th Meeting of the Southeastern Section of the APS, Charlotte, NC, USA, October 24–26, 2024,
Invited talk: *Exploring Baryon Number Violation*.

48. Theory Seminar, Max Planck Institute for Nuclear Physics, Heidelberg, Germany, October 14, 2024,
The landscape of baryon number violation.

47. Workshop on Baryon and Lepton Number Violation (BLV), Karlsruhe, Germany, October 8–11, 2024,
Invited plenary talk: *Lepton Flavor Violation by Two Units*.

46. Theory Seminar, Virginia Tech, USA, October 2, 2024,
Dirac neutrinos and the matter asymmetry of our universe.

45. BEACH 2024, Charleston, South Carolina, USA, June 3–7, 2024,
Invited plenary talk: *Theoretical Perspectives on Lepton Flavor Violation*.

44. DPF-Pheno 24, Pittsburgh, USA, May 13–17, 2024,
Baryon Number Violation Involving Tauons.

43. Neutrinos from Home 2024, virtual, April 2024,
Invited talk: *Why do we care about sterile neutrinos?*

42. Physics Colloquium, Virginia Commonwealth University, USA, January 26, 2024,
Does matter decay?

41. TAU2023, Louisville, Kentucky, USA, December 4–8, 2023,
Invited plenary talk: *Lepton flavor violation with tau leptons*.

40. 28th PASCOS, Irvine, USA, June 26–30, 2023,
Plenary talk: *Dirac neutrinos in the cosmic microwave background*.

39. Physics Colloquium, University of Virginia, USA, January 27, 2023,
Unraveling the origin of neutrino masses

38. 89th Meeting of the Southeastern Section of the APS, Mississippi, USA, November 3–5, 2022,
Invited talk: *Explaining CDF's large W-boson mass in neutrino models*.

37. Workshop on Baryon and Lepton Number Violation (BLV), Brussels, Belgium, September 5–8, 2022,
Invited plenary talk: *Baryon and lepton number violation*.

36. 23rd Workshop on Neutrinos from Accelerators, Salt Lake City, USA, July 31–August 6, 2022,
Invited talk: *Connection between neutrino mass models and muon experiments*.

35. Majorana-Raychaudhuri Seminar, virtual, July 29, 2022,
Invited talk: *Revisiting Q-Balls*.

34. Community Summer Study Snowmass, Seattle, USA, July 17–26, 2022,
Invited talk: *Theory of Charged Lepton Flavor Violation*.

33. 29th International Conference on Supersymmetry (SUSY), Ioannina, Greece, June 27–July 2, 2022,
Explaining lepton-flavor non-universality and self-interacting dark matter with $L_\mu - L_\tau$.

32. SynCRETism 2022, Chania, Greece, June 20–24, 2022,
Invited plenary talk: *Particle physics anomalies and connections to neutron stars and small-scale structure*.

31. 2nd muon $g-2$ workshop (SchwingerFest 2022), UCLA, USA, June 14–17, 2022,
Invited plenary talk: $g-2$ *in models beyond the Standard Model*.

30. Snowmass Rare Processes Frontier Spring Meeting, Cincinnati, USA, May 16–19, 2022,
Invited talk: *Charged lepton flavor violation*.

29. 7th Symposium on Neutrinos and DM in Nuclear Physics, Asheville, USA, May 15–21, 2022,
Explaining lepton-flavor non-universality and self-interacting dark matter with $L_\mu - L_\tau$.

28. Physics Colloquium, William & Mary, USA, February 25, 2022,
Does matter decay?

27. Domain Wall Quarks @ 25, Brookhaven National Lab (virtual), USA, December 13–17, 2021,
Invited talk: *Anomalies and* $L_\mu - L_\tau$.

26. Anomalies 2021 Conference, Virtual, November 10–12, 2021,
Plenary talk: *Anomalies and* $L_\mu - L_\tau$.

25. Brookhaven Forum 2021, Brookhaven National Lab, USA, November 3–5, 2021,
Light particles with baryon and lepton numbers.

24. Theoretical Innovations for Future Experiments Regarding Baryon Number Violation by Two Units, Amherst Center for Fundamental Interactions, Massachusetts, USA, August 3–6, 2020,
Invited talk: *Covering baryon number violation with inclusive searches*.

23. BLV circa 2020, Case Western Reserve University, Ohio, USA, July 6–8, 2020,
Invited talk: *Exotic B and L Violating Processes*.

22. Physics Beyond Colliders meets theory, CERN, Geneva, Switzerland, June 8–11, 2020,
Invited talk: *The Majoron in rare decays*.

21. TRIUMF Theory Workshop, Vancouver, Canada, March 11–13, 2020,
Invited talk: *Dark matter interactions with muons in neutron stars*.

20. Physics Colloquium, University of Virginia, USA, February 5, 2020,
Neutrinos – Harbingers of New Physics.

19. CERN Neutrino Platform Week, Geneva, Switzerland, October 7–11, 2019,
Invited plenary talk: *Neutrino interactions with light new bosons*.

18. Heavy-Quark Physics and Fundamental Symmetries, INT, Seattle, USA, August 19–23, 2019,
Pati–Salam models and B-meson anomalies.

17. SUSY 2019, Corpus Christi, USA, May 20–24, 2019,
Invited talk: *Neutrino masses and lepton flavor violation*.

16. Rencontres de Moriond - Electroweak Session, La Thuile, Italy, March 16–23, 2019,
Invited plenary talk: *Pati-Salam explanations of the B-meson anomalies*.

15. UCLA SoCal BSM Workshop 2019, Los Angeles, USA, January 12, 2019,
Invited plenary talk: *A Show of Force(s)*.

14. NuTheories Workshop, Pittsburgh, USA, November 4–11, 2018,
Invited plenary talk: *Beyond the 3×3 neutrino paradigm with majorons*.

13. Neutrino Oscillation Workshop 2018, Rosa Marina, Ostuni, Italy, September 9–16, 2018,
Invited talk: *Majorons as cold light dark matter*.

12. HPP meeting at NIKHEF, Nikhef, Amsterdam, Netherlands, June 29, 2018,
Invited plenary talk: *Rare Decays with Lepton Flavor*.

11. Neutrino 2018, Heidelberg, Germany, June 4–9, 2018,
Invited plenary talk: *Rare Decays with Lepton Flavor*.

10. Searching for Physics Beyond the SM Using Charged Leptons, San Juan, Puerto Rico, May 21–25, 2018,
Invited plenary talk: *Interpretation of Charged Lepton Flavor Violation and Connection to Neutrino Physics*.

9. Solvay workshop "Beyond the Standard Model with Neutrinos and Nuclear Physics", Université Libre de Bruxelles, Belgium, November 29–December 1, 2017,
Invited plenary talk: *Neutrino magnetic moments*.

8. 19th Intl. Workshop on Neutrinos from Accelerators, Uppsala, Sweden, September 25–30, 2017,
Invited talk: *Neutrino Lines from Majoron Dark Matter*.

7. ALPS 2017, an Alpine LHC Physics Summit, Obergurgl, Austria, April 17–22, 2017,
Invited talk: *Neutrino Interactions beyond the Standard Model*.

6. XIIth Rencontres du Vietnam, Quy Nhon, Vietnam, September 25–October 2, 2016,
Invited plenary talk: *Models of lepton flavour violation*.

5. 2nd Intl. Conference on Charged Lepton Flavor Violation, Charlottesville, VA, June 20–22, 2016,
Invited plenary talk: *Flavor violation in multi-Higgs-doublet models*.

4. 5th KIAS Workshop on Particle Physics and Cosmology, Seoul, Korea, November 9–13, 2015,
Invited plenary talk: *Hints for new physics in flavor observables*.

3. IPM conference on Particle Physics, Tehran, Iran, September 22–27, 2015,
Invited plenary talk: *B-physics and other anomalies as hints for new physics*.

2. 50th Rencontres de Moriond – Electroweak Session, La Thuile, Italy, March 14–21, 2015,
Invited plenary talk: *Lepton number violation with and without Majorana neutrino masses*.

1. International School of Nuclear Physics (35th Course) Neutrino Physics: Present and Future,
Erice, Italy, September 16–24, 2013,
Plenary talk: *Lepton number violation with Dirac neutrinos*.