Kevin J. Kelly
Curriculum Vitae

PERSONAL DETAILS

Location	Fermilab Theory Group
Address	PO Box 500, MS 106, Batavia, IL 60510
Phone	(248) 635-4238
E-mail	kkelly12 [at] fnal.gov

EMPLOYMENT

Postdoctoral Research Associate **2018-Present**
Fermi National Accelerator Laboratory (Theory Group)

EDUCATION

PhD Physics **2013-2018**
Northwestern University, Advisor: Prof. André de Gouvêa
BSc. Physics, Mathematics **2009-2013**
University of Notre Dame, Summa Cum Laude. Advisor: Prof. Michael Hildreth

COMMUNITY SERVICE

Journal Referee
Physical Review Letters, Physical Review D, Journal of High Energy Physics
Snowmass 2021
Snowmass Early Career Convener: BSM with Neutrinos (NF03) & Neutrino Theory (TF11).
White-paper contribution on self-interacting neutrinos forthcoming.
Mini-Workshop on Neutrino Theory: Co-Organized.
Neutrino University 2019
Lecture series organizer, Fermilab, June-August 2019
Fermilab Undergraduate Lecture Series
Summer 2020, speaker: "Introduction to Particle Physics"
Fermilab Saturday Morning Physics
2019-2020 sessions: lectures on special relativity
KICP Lifelong Learning Institute
Outreach talks, October 2019
Physics Opportunities at the Near DUNE Detector Hall (PONDD) 2018
Organizer, Fermilab, December 2018
Physics & Astronomy Graduate Student Council
Northwestern University – Secretary (2016), Teaching Assistant Committee Head (2016-2017)
Society of Physics Students
University of Notre Dame - Vice President (2012-2013)

HONORS AND AWARDS

Fermilab
Lab Directed R&D (LDRD) Award Co-Investigator: "Accelerator-based Dark Matter Initiatives at Fermilab"
Northwestern University
Weinberg College Outstanding Graduate Student Teacher Award (2015-2016), Physical Sciences
Fermilab Neutrino Physics Center (NPC) Scholar, Fall 2017
University of Notre Dame
Outstanding Physics Major Award, Notre Dame Department of Physics (Spring 2013)
George Kolettis Award in Mathematics (Spring 2013)

PUBLICATIONS

For a complete and up-to-date listing of publications, see my InspireHEP Profile

32. **Identifying the Nature of a Heavy Neutral Lepton via its Decay Distributions**
André de Gouvêa, Patrick J. Fox, Boris Kayser, Kevin J. Kelly. To appear.

31. **Three-Body Decays of Heavy Dirac and Majorana Fermions**
André de Gouvêa, Patrick J. Fox, Boris Kayser, Kevin J. Kelly. To appear.

30. **LEvEL: Low-Energy Neutrino Experiment at the LHC**
Kevin J. Kelly, Pedro A.N. Machado, Alberto Marchionni, Yuber F. Perez-Gonzalez. To appear.

29. **Current and Future Neutrino Oscillation Constraints on Leptonic Unitarity**
Sebastian A. R. Ellis, Kevin J. Kelly, Shirley Weishi Li. Submitted for publication. arXiv:2008.01088.

28. **Back to (Mass-)Square(d) One: The Neutrino Mass Ordering in Light of Recent Data**
Kevin J. Kelly, Pedro A. N. Machado, Stephen J. Parke, Yuber F. Perez-Gonzalez, Renata Zukanovich Funchal. Submitted for publication. arXiv:2007.08526.

27. **Origin of Sterile Neutrino Dark Matter via Vector Secret Neutrino Interactions**
Kevin J. Kelly, Manibrata Sen, Walter Tangarife, Yue Zhang. Phys. Rev. **D101** (2020) no. 11, 115031. arXiv:2005.03681.

26. **Leptonic Unitarity Triangles**
Sebastian A.R. Ellis, Kevin J. Kelly, Shirley Weishi Li. Submitted for publication. arXiv:2004.13719.

25. **Searches for Decays of New Particles in the DUNE Multi-Purpose Near Detector**
Jeffrey M. Berryman, André de Gouvêa, Patrick J. Fox, Boris J. Kayser, Kevin J. Kelly, Jennifer L. Raaf. **JHEP** 02 (2020) 174. arXiv:1912.07622.

24. **Prospects of Measuring Oscillated Decay-at-Rest Neutrinos at Long Baselines**
Roni Harnik, Kevin J. Kelly, Pedro A.N. Machado. Phys. Rev. **D101** (2020) no. 3, 033008. arXiv:1911.05088.

23. **White Paper on New Opportunities at the Next-Generation Neutrino Experiments (Part 1: BSM Neutrino Physics and Dark Matter)**
C.A. Argüelles et. al. arXiv:1907.08311.

22. **Neutrino Non-Standard Interactions: A Status Report**
P.S. Bhupal Dev, K.S. Babu, Peter B. Denton, Pedro A.N. Machado et. al. SciPost Phys. Proc. 2 (2019) 001. arXiv:1907.00991.

21. **Constraining the Self-Interacting Neutrino Interpretation of the Hubble Tension**
Nikita Blinov, Kevin J. Kelly, Gordan Z. Krnjaic, Samuel D. McDermott. Phys. Rev. **Lett. 123** (2019) no. 19, 191102. arXiv:1905.02727.

20. **Physics with Beam Tau-Neutrino Appearance at DUNE**
André de Gouvêa, Kevin J. Kelly, G.V. Stenico, Pedro Pasquini. Phys. Rev. **D100** (2019) no. 1, 016004. arXiv:1904.07265.

19. **Sub-GeV Atmospheric Neutrinos and CP-Violation in DUNE**
Kevin J. Kelly, Pedro A.N. Machado, Iván Martinez-Soler, Stephen J. Parke, Yuber F Perez-Gonzalez. Phys. Rev. **Lett. 123** (2019) no. 8, 081801. arXiv:1904.02751.

18. **Hunting On- and Off-Axis for Light Dark Matter with DUNE-PRISM**
Valentina De Romeri, Kevin J. Kelly, Pedro A.N. Machado. Phys. Rev. **D100** (2019) no. 9, 095010. arXiv:1903.10505.

17. **Mono-Neutrino at DUNE: New Signals From Neutrinophilic Thermal Dark Matter**
Kevin J. Kelly, Yue Zhang. Phys. Rev. **D99** (2019) no. 5, 055034. arXiv:1901.01259.

16. **Proton Fixed-Target Scintillation Experiment to Search for Minicharged Particles**
Kevin J. Kelly, Yu-Dai Tsai. Phys. Rev. **D100** (2019) no. 1, 015043. arXiv:1812.03998.

15. **Dark Tridents at Off-Axis Liquid Argon Neutrino Detectors**
André de Gouvêa, Patrick J. Fox, Roni Harnik, Kevin J. Kelly, Yue Zhang. **JHEP** 1901 (2019) 001. arXiv:1809.06388

14. **Multimessenger Astronomy and New Neutrino Physics**
Kevin J. Kelly, Pedro A.N. Machado. **JCAP** 1810 (2018) no.10, 048. arXiv:1808.02889

13. **Shining light on the mass scale and nature of neutrinos with $e\gamma \to e\nu\overline{\nu}$**
Jeffrey M. Berryman, André de Gouvêa, Kevin J. Kelly, Michael Schmitt. Phys. Rev. **D98** (2018) no.1, 016009. arXiv:1805.10294

12. **Matter Density Profile Shape Effects at DUNE**
Kevin J. Kelly, Stephen J. Parke. Phys. Rev. **D98** (2018) no.1, 015025. arXiv:1802.06784

11. **Lepton-Number-Charged Scalars and Neutrino Beamstrahlung**
Jeffrey M. Berryman, André de Gouvêa, Kevin J. Kelly, Yue Zhang. Phys. Rev. **D97** (2018) no.7, 075030. arXiv:1802.00009

10. **Neutrino versus antineutrino oscillation parameters at DUNE and Hyper-Kamiokande experiments**
André de Gouvêa, Kevin J. Kelly. Phys. Rev. **D96** (2017) no.9, 095018. arXiv:1709.06090

9. **Dark Matter and Neutrino Mass from the Smallest Non-Abelian Chiral Dark Sector**
Jeffrey M. Berryman, André de Gouvêa, Kevin J. Kelly, Yue Zhang. Phys. Rev. **D96** (2017) no.7, 075010. arXiv:1706.02722

8. **Searches for new physics at the Hyper-Kamiokande experiment**
Kevin J. Kelly. Phys. Rev. **D95** (2017) no.11, 115009. arXiv:1703.00448

7. **Lepton-number-violating searches for muon to positron conversion**
Jeffrey M. Berryman, André de Gouvêa, Kevin J. Kelly, Andrew Kobach. Phys. Rev. **D95** (2017) no.11, 115010. arXiv:1611.00032

6. **False Signals of CP-Invariance Violation at DUNE**
André de Gouvêa, Kevin J. Kelly. arXiv: 1605.09376

5. **Imperfect mirror copies of the standard model**
Jeffrey M. Berryman, André de Gouvêa, Daniel Hernández, Kevin J. Kelly. Phys. Rev. **D94** (2016) no.3, 035009. arXiv:1605.03610

4. **Large extra dimensions at the Deep Underground Neutrino Experiment**
Jeffrey M. Berryman, André de Gouvêa, Kevin J. Kelly, O.L.G. Peres, Zahra Tabrizi. Phys. Rev. **D94** no.3, 033006. arXiv:1603.00018

3. **Non-standard neutrino interactions at DUNE**
   André de Gouvêa, Kevin J. Kelly. Nucl. Phys. **B908**, 318 (2016). arXiv:1511.05562

2. **Sterile neutrino at the Deep Underground Neutrino Experiment**
   Jeffrey M. Berryman, André de Gouvêa, Kevin J. Kelly, Andrew Kobach. Phys. Rev. **D92** (2015) no.7, 073012. arXiv:1507.03986

1. **CP-invariance violation at short-baseline experiments in 3+1 neutrino scenarios**
   André de Gouvêa, Kevin J. Kelly, Andrew Kobach. Phys. Rev. **D91** (2015) no.5, 053005. arXiv:1412.1479

SEMINARS

Korea Institute for Advanced Study High Energy Physics Seminar
Remote, July 2020
"Self-Interacting Neutrinos, The Hubble Tension, and Sterile Neutrino Dark Matter"
SLAC Elementary Particle Physics Seminar
Remote, June 2020
"Leptonic Unitarity from Neutrino Oscillations: Current & Future Status"
Brookhaven National Lab High Energy Theory Seminar
Remote, May 2020
"Dark Sector Decays in the DUNE Multipurpose Near Detector"
Lawrence Berkeley National Lab Particle Physics Seminar
Berkeley, CA, December 2019
Texas A&M Mitchell Institute High Energy Seminar
College Station, TX, December 2019
"New Physics Searches at the DUNE Near Detector"
Argonne National Lab Theory Seminar
Argonne, IL, April 2019
Fermilab Theory Seminar
Batavia, IL, March 2019
Fermilab Neutrino Seminar Series
Batavia, IL, January 2018
"How much does matter matter at DUNE?"
Northwestern University
Evanston, IL, November 2017
"Independent Determination of Oscillation Parameters for Neutrinos and Antineutrinos"
University of Illinois at Chicago High Energy Physics Seminar
Chicago, IL, November 2017
"Chiral Gauge Theories for Dark Sector Construction"
Indiana University High Energy Physics Seminar
Bloomington, IN, March 2017
University of Notre Dame High Energy Physics Seminar
Notre Dame, IN, January 2017
Argonne National Lab Theory Seminar
Argonne, IL, January 2017
Fermilab Theory Seminar
Batavia, IL, September 2016
"New Physics Searches at DUNE"
Northwestern University
Evanston, IL, 2014-2016

"CP Violation from a Fourth Neutrino?"
"Sterile Neutrinos at DUNE"
"Non-Standard Neutrino Interactions"

CONFERENCE PRESENTATIONS

New Perspectives 2020 Remote conference, August 2020. Speaker: "Leptonic Unitarity: Current and Future"
PROSPECT Oscillation Workshop August 2020. Invited speaker: "Short-baseline/Long-baseline Oscillation Measurement Interplay: A Theorist's Perspective"
Fermilab Users Meeting 2020 Remote conference, August 2020. Plenary Speaker: "Neutrino Theory Post-Nu2020"
Neutrino2020 Remote conference, June 2020. Poster Presented: "Searches for Dark Sector Mediators in the DUNE Multi-Purpose Near Detector." Associated video available here.
Neutrinos from the Lab to the Cosmos Institute for Nuclear Theory, University of Washington, January 2020. Speaker: "New Neutrino Physics at Long-Baseline Experiments" Discussion leader: "Neutrinos and the Hubble Tension"
Precision Investigations in the Neutrino Sector (PINS) 2019 SLAC, July 2019. Speaker: "Sub-GeV Atmospheric Neutrinos and CP Violation"
SBND Collaboration Meeting 2019 Ann Arbor, June 2019. Remote speaker: "Missing Transverse Momentum Signatures in SBND"
Current Trends in Particle Theory (CTPT) 2019 Chicago, IL, June 2019
Fermilab New Perspectives Meeting 2019 Fermilab, 2019. Invited speaker: "Neutrino Theory in 10 Minutes"
New Directions in the Search for Light Dark Matter Particles Fermilab, June 2019
NTN Workshop on Non-standard Neutrino Interactions St. Louis, MO, May 2019. Speaker: "Light Dark Matter at DUNE"
DUNE Collaboration Meeting 2019 Fermilab, May 2019. Invited speaker: "Beyond the Standard Model Physics at the DUNE Near Detector"
LCTP Spring Neutrino Physics Symposium Ann Arbor, MI, April 2019. Speaker: "Searches for Dark Matter with the DUNE Near Detector"
Discrete2018 Vienna, Austria, November 2018. Parallel session speaker: "Multimessenger Astronomy and New Neutrino Physics"
NuFact 2018 Blacksburg, VA, August 2018. Parallel session speaker: "Lepton-number-charged Scalars at DUNE"
Summer Institute for Neutrino Theory (SINT) 2017 Blacksburg, VA, July 2017
Pheno 2017 Pittsburgh, PA, May 2017. Parallel session speaker: "Lepton Number Violation and Muon-to-Positron Conversion"
Current Trends in Particle Theory (CTPT) 2017 Chicago, IL, March 2017. Poster presented: "Lepton Number Violation and Muon-to-Positron Conversion"
NuFact 2016 Quy Nhon, Vietnam, August 2016. Parallel session speaker: "New Physics Searches at DUNE"
Theoretical Advanced Summer Institute (TASI) 2016 Boulder, CO, June 2016
Nu@Fermilab Batavia, IL, July 2015