

# NICHOLAS L. RODD

---

CONTACT	CERN TH CH-1211 Geneva 23 Switzerland	 <a href="mailto:nrodd@cern.ch">nrodd@cern.ch</a>  <a href="http://nickrodd.com">nickrodd.com</a>  <a href="https://github.com/nickrodd">github.com/nickrodd</a>
POSITIONS	<b>CERN</b> LD Staff Member <b>University of California, Berkeley</b> Miller Research Fellow	2021-present  2018-2021
EDUCATION	<b>Massachusetts Institute of Technology</b> Ph.D. Physics Advisor: Tracy Slatyer Thesis: Listening to the Universe through Indirect Detection  <b>Melbourne University</b> M.Sc. (Distinction) Physics Advisor: Raymond Volkas and Elisabetta Barberio Thesis: Analysis of neutrino mass effective operators and testing their signatures at the Large Hadron Collider <b>Melbourne University</b> B.Sc. & LL.B. (Hons)	2013-2018  2011-2012  2006-2010
SELECTED AWARDS	APS DAP Cecilia Payne-Gaposchkin Thesis Award J. J. and Noriko Sakurai Dissertation Award in Theoretical Particle Physics Miller Research Fellowship Price Prize in Cosmology and AstroParticle Physics Andrew M. Lockett III Memorial Fund Award, MIT Acevedo Fellowship, MIT Kerman Fellowship, MIT Fulbright Postgraduate Scholarship (declined) Henry James Williams Scholarship, Melbourne University Bryan Scholarship in Natural Science, Melbourne University Raynes Dickson Memorial Exhibition in Deals, Melbourne University Australian Students Prize	2020 2019 2018 2017 2016 2015 2013 2013 2012 2011 2010 2005
PUBLICATIONS	43. V. Domcke, C. Garcia-Cely, N. L. Rodd <i>A novel search for high-frequency gravitational waves with low-mass axion haloscopes</i> 42. F. List, N. L. Rodd, G. F. Lewis <i>Dim but not entirely dark: Extracting the Galactic Center Excess' source-count distribution with neural nets</i> 41. G. H. Collin, N. L. Rodd, T. Erjavec, K. Perez <i>A Compound Poisson Generator approach to Point-Source Inference in Astrophysics</i> 40. The ABRACADABRA Collaboration <i>The search for low-mass axion dark matter with ABRACADABRA-10cm</i> 39. J. W. Foster, M. Kongsore, C. Dessert, Y. Park, N. L. Rodd, K. Cranmer, B. R. Safdi <i>A deep search for decaying dark matter with XMM-Newton blank-sky observations</i> 38. J. A. Dror, H. Murayama, N. L. Rodd <i>The Cosmic Axion Background</i>	<a href="https://arxiv.org/abs/2202.00695">arXiv:2202.00695</a>  <a href="https://arxiv.org/abs/2107.09070">arXiv:2107.09070</a> <a href="https://arxiv.org/abs/2104.04529">arXiv:2104.04529</a>  <a href="https://arxiv.org/abs/2102.06722">arXiv:2102.06722</a> <a href="https://arxiv.org/abs/2102.02207">arXiv:2102.02207</a>  <a href="https://arxiv.org/abs/2101.09287">arXiv:2101.09287</a>

37. G. N. Remmen, N. L. Rodd *Phys.Rev.* **D105** (2022) 036006  
*Signs, Spin, SMEFT: Sum Rules at Dimension Six* arXiv:2010.04723
36. J. W. Foster, Y. Kahn, R. Nguyen, N. L. Rodd, B. R. Safdi *Phys.Rev.* **D103** (2021) 076018<sup>†</sup>  
*Dark Matter Interferometry* arXiv:2009.14201
35. L. Rinchuso, O. Macias, E. Moulin, N. L. Rodd, T. R. Slatyer *Phys.Rev.* **D103** (2021) 023011  
*Prospects for Heavy WIMP Dark Matter with CTA: the Wino and Higgsino* arXiv:2008.00692
34. C. W. Bauer, N. L. Rodd, B. R. Webber *JHEP* **06** (2021) 121  
*Dark Matter Spectra from the Electroweak to the Planck Scale* arXiv:2007.15001
33. I. Baldes, F. Calore, K. Petraki, V. Poireau, N. L. Rodd *SciPost Phys.* **9** (2020) 068  
*Indirect searches for dark matter bound state formation and level transitions* arXiv:2007.13787
32. F. List, N. L. Rodd, G. F. Lewis, I. Bhat *Phys.Rev.Lett.* **125** (2020) 241102  
*The GCE in a New Light: Disentangling the  $\gamma$ -ray Sky with Bayesian Graph Convolutional Neural Networks* arXiv:2006.12504
31. C. Dessert, N. L. Rodd, B. R. Safdi *Phys.Dark Univ.* **30** (2020) 100656  
*Response to a comment on Dessert et al. "The dark matter interpretation of the 3.5 keV line is inconsistent with blank-sky observations"* arXiv:2006.03974
30. G. N. Remmen, N. L. Rodd *Phys.Rev.Lett.* **125** (2020) 081601  
*Flavor Constraints from Unitarity and Analyticity* arXiv:2004.02885
29. M. Buschmann, N. L. Rodd, B. R. Safdi, L. J. Chang, S. Mishra-Sharma, M. Lisanti, O. Macias *Phys.Rev.* **D102** (2020) 023023  
*Foreground Mismodeling and the Point Source Explanation of the Fermi Galactic Center Excess* arXiv:2002.12373
28. The IceCube Collaboration *Astrophys.J.* **893** (2020) 102  
*A Search for Neutrino Point-Source Populations in 7 Years of IceCube Data with Neutrino-count Statistics* arXiv:1909.08623
27. L. J. Chang, S. Mishra-Sharma, M. Lisanti, M. Buschmann, N. L. Rodd, B. R. Safdi *Phys.Rev.* **D101** (2020) 023014  
*Characterizing the Nature of the Unresolved Point Sources in the Galactic Center* arXiv:1908.10874
26. G. N. Remmen, N. L. Rodd *JHEP* **12** (2019) 032  
*Consistency of the Standard Model Effective Field Theory* arXiv:1908.09845
25. The ABRACADABRA Collaboration *Phys.Rev.* **D99** (2019) 052012  
*Design and Implementation of the ABRACADABRA-10 cm Axion Dark Matter Search* arXiv:1901.10652
24. C. Dessert, N. L. Rodd, B. R. Safdi *Science* **367** (2020) 6485  
*The dark matter interpretation of the 3.5-keV line is inconsistent with blank-sky observations* arXiv:1812.06976
23. The ABRACADABRA Collaboration *Phys.Rev.Lett.* **122** (2018) 121802  
*First Results from ABRACADABRA-10 cm: A Search for Sub- $\mu$ eV Axion Dark Matter* arXiv:1810.12257
22. M. Baumgart, T. Cohen, E. Moulin, I. Mout, L. Rinchuso, N. L. Rodd, T. R. Slatyer, I. W. Stewart, V. Vaidya *JHEP* **01** (2019) 036  
*Precision Photon Spectra for Wino Annihilation* arXiv:1808.08956
21. L. Rinchuso, N. L. Rodd, I. Mout, E. Moulin, M. Baumgart, T. Cohen, T. R. Slatyer, I. W. Stewart, V. Vaidya *Phys.Rev.* **D98** (2018) 123014  
*Hunting for Heavy Winos in the Galactic Center* arXiv:1808.04388
20. M. Baumgart, T. Cohen, I. Mout, N. L. Rodd, T. R. Slatyer, M. P. Solon, I. W. Stewart, V. Vaidya *JHEP* **03** (2018) 117  
*Resummed Photon Spectra for WIMP Annihilation* arXiv:1712.07656
19. J. W. Foster, N. L. Rodd, B. R. Safdi *Phys.Rev.* **D97** (2018) 123006  
*Revealing the Dark Matter Halo with Axion Direct Detection* arXiv:1711.10489

18. The HAWC Collaboration JCAP **1802** (2018) 049  
*A Search for Dark Matter in the Galactic Halo with HAWC* arXiv:1710.10288
17. R. Bartels, D. Hooper, T. Linden, S. Mishra-Sharma, Phys.Dark Univ. **20** (2016) 88  
N. L. Rodd, B. R. Safdi, T. R. Slatyer arXiv:1710.10266  
*Comment on “Characterizing the population of pulsars in the Galactic bulge with the Fermi Large Area Telescope” [arXiv:1705.00009v1]*
16. R. E Keeley, S. N. Abazajian, A. Kwa, N. L. Rodd, B. R. Safdi Phys.Rev. **D97** (2018) 103007  
*What the Milky Way’s Dwarfs tell us about the Galactic Center extended excess* arXiv:1710.03215
15. M. Lisanti, S. Mishra-Sharma, N. L. Rodd, Phys.Rev. **D97** (2018) 063005  
B. R. Safdi, R. H. Wechsler arXiv:1709.00416  
*Mapping Extragalactic Dark Matter Annihilation with Galaxy Surveys: A Systematic Study of Stacked Group Searches*
14. M. Lisanti, S. Mishra-Sharma, N. L. Rodd, B. R. Safdi Phys.Rev.Lett. **120** (2018) 101101  
*A Search for Dark Matter Annihilation in Galaxy Groups* arXiv:1708.09385
13. P. Ilten, N. L. Rodd, J. Thaler, M. Williams Phys.Rev. **D96** (2017) 054019  
*Disentangling Heavy Flavor at Colliders* arXiv:1702.02947
12. T. Cohen, K. Murase, N. L. Rodd, B. R. Safdi, Y. Soreq Phys.Rev.Lett. **119** (2017) 021102  
*Gamma-ray Constraints on Decaying Dark Matter and Implications for IceCube* arXiv:1612.05638
11. G. Ovanessian, N. L. Rodd, T. R. Slatyer, I. W. Stewart Phys.Rev. **D95** (2017) 055001  
*The One-Loop Correction to Heavy Dark Matter Annihilation* arXiv:1612.05638
10. S. Mishra-Sharma, N. L. Rodd, B. R. Safdi Astron.J. **153** (2017) 253  
*NPTFit: A code package for Non-Poissonian Template Fitting* arXiv:1612.03173
9. T. Linden, N. L. Rodd, B. R. Safdi, T. R. Slatyer Phys.Rev. **D94** (2016) 103013  
*The High-Energy Tail of the Galactic Center Gamma-Ray Excess* arXiv:1604.01026
8. G. Elor, N. L. Rodd, T. R. Slatyer, W. Xu JCAP **1606**, 024 (2015)  
*Model-Independent Indirect Detection Constraints on Hidden Sector Dark Matter* arXiv:1511.08787
7. G. Elor, N. L. Rodd, T. R. Slatyer Phys.Rev. **D91** (2015) 103531  
*Multi-Step Cascade Annihilations of Dark Matter and the Galactic Center Excess* arXiv:1503.01773
6. T. Daylan, D. P. Finkbeiner, D. Hooper, T. Linden, Phys.Dark Univ. **12** (2016)  
S. K. N. Portillo, N. L. Rodd, T. R. Slatyer arXiv:1402.6703  
*The Characterization of the Gamma-Ray Signal from the Central Milky Way: A Case for Annihilating Dark Matter*
5. P. W. Angel, Y. Cai, N. L. Rodd, M. A. Schmidt, R. R. Volkas JHEP **10** (2013) 118  
*Testable two-loop radiative neutrino mass model based on an  $LLQd^cQd^c$  effective operator* arXiv:1308.0463
4. A. Kobakhidze, N. L. Rodd Int.J.Theor.Phys. **52** (2013) 2636  
*Time-symmetric quantization in spacetimes with event horizons* arXiv:1307.5126
3. P. W. Angel, N. L. Rodd, R. R. Volkas Phys.Rev. **D87** (2013) 073007  
*Origin of neutrino masses at the LHC:  $\Delta L = 2$  effective operators and their ultraviolet completions* arXiv:1212.6111
2. The ATLAS Collaboration JHEP **12** (2012) 7  
*Search for anomalous production of prompt like-sign lepton pairs at  $\sqrt{s} = 7$  TeV with the ATLAS detector* arXiv:1210.4538
1. The ATLAS Collaboration Eur.Phys.J. **C72** (2012) 2244  
*Search for doubly charged Higgs bosons in like-sign dilepton final states with the ATLAS detector* arXiv:1210.5070  
(Only listed as internal author on this paper due to ATLAS regulations allowing a maximum of one publication before service work has been completed.)

PLENARIES & COLLOQUIA	XIX International Workshop on Neutrino Telescopes	February 2021
	Melbourne University	December 2019
	Next Frontiers in the Search for Dark Matter, Florence, Italy	September 2019
	In Pursuit of New Particles and Paradigms, Aspen, USA	March 2019
CONFERENCE TALKS	Computational Tools for High Energy Physics and Cosmology, Virtual	November 2021
	New Physics from The Sky, Florence, Italy	October 2021
	PANIC 2021 Lisbon Portugal, Virtual	September 2021
	CMB-S4 collaboration meeting, Virtual	August 2021
	Electroweak effects at high energy, Virtual	September 2020
	DM Radio Collaboration Meeting, Virtual	August 2020
	APS April Meeting, Virtual	April 2020
	New Techniques for Dark Matter Discovery, Vancouver, Canada	March 2020
	TeV Particle Astrophysics 2019, Sydney, Australia	December 2019
	NEPLES-2019, Seoul, South Korea	September 2019
	APS April Meeting, Denver, USA	April 2019
	Berkeley week at IPMU, Kashiwa, Japan	January 2019
	TeV Particle Astrophysics 2018, Berlin, Germany	August 2018
	TeV Particle Astrophysics 2017, Columbus, USA	August 2017
	Cosmic Rays, Pulsars & Dark Matter, Santa Fe, USA	March 2017
	CosPA 2016, Sydney, Australia	November 2016
	TeV Particle Astrophysics 2016, CERN, Switzerland	September 2016
	LoopFest XV, Buffalo, USA	August 2016
	Gamma Rays & Dark Matter, Obergurgl, Austria	December 2015
	Intense Electron Beams Workshop, Ithaca, USA	June 2015
	CIPANP 2015, Vail, USA	May 2015
	Astroparticle Physics 2014, Amsterdam, Netherlands	June 2014
	Strings and Super Yang Mills, Melbourne, Australia	April 2013
	Australian-Italian Symposium, Melbourne, Australia	April 2012
	CoEPP Workshop, Lorne, Australia	February 2012
SEMINARS	Miller Lunch Talk, University of Cambridge, University of Michigan, Rutgers University, CERN, University of Sydney, Kavli IPMU, ARC Centre of Excellence for Dark Matter, University of Melbourne, KASI, McGill University, UC Santa Cruz	2021
	LHC Results Forum, UC Santa Cruz, INPA LBNL, UC Davis, University of Maryland, BSM PANDEMIC, Brown University, KICP, University of Minnesota, Technical University of Munich, Korea Institute for Advanced Study, University of Padua	2020
	UC San Diego, UC Davis, University of Washington, UC Santa Cruz, SLAC	2019
	Stanford, Melbourne University, UC Berkeley	2018
	Harvard, University of Michigan, Princeton, The Ohio State University (Price Prize Seminar), UC Berkeley, UC Irvine, University of Oregon, Fermilab, New York University, The Ohio State University, Perimeter Institute, Virginia Tech, Pennsylvania State University	2017
	Monash University, Melbourne University, McGill University	2016
TEACHING EXPERIENCE	Schools and Lectures	
	* BCVSPIN-2021: Probing the Mysteries of the Universe	January 2022
	* IPMU Pedagogical Seminar Series	November 2021
	Quantum Field Theory 1 (TA and delivered 4 lectures), MIT (6.3/7)	Spring 2018
	Relativity (TA), MIT (6.0/7)	Fall 2017
	Relativity (TA), MIT	Fall 2014
	Quantum Field Theory (TA), Melbourne University	2013
	Physics for Biomed (Recitation Instructor), Melbourne University	2012
	Introductory physics laboratory (Demonstrator), Melbourne University	2011
	(Student evaluation scores are given in parentheses where available.)	

MENTORING	Florian List (graduate)	2020-2021
	Michael Toomey (undergraduate)	2017-2018
SERVICE	<b>Referee:</b> Physical Review Letters, Physical Review D, Journal of High Energy Physics, Physics Letters B, SciPost, The Astrophysical Journal, Computer Physics Communication	
	Organizer of <i>Second EuCAPT Annual Symposium</i> ,	May 2022
	Organizer of <i>New Methods and Ideas at the Frontiers of Particle Physics</i>	March 2022
	Winter Aspen Conference	
	Organizer of the HEP/Astro Results Forum	2021-
	Convener for COSMO'21, University of Illinois and Online	August 2021
	Dark matter convener for TeVPA 2019, Sydney, Australia	December 2019
	Co-organizer of mini-workshop on the Galactic Center excess, Columbus, OH	August 2017
	Organizer of summer school on the NPTF, MIT	June 2017
	LBNL Particle Seminar Organizer, Lawrence Berkeley National Laboratory	2019-2020
OUTREACH	Beyond the Standard Model Journal Club Organizer, MIT	2015-2017
	Ph.D. Thesis Committee	
	* Harrison Ploeg, “The Galactic Millisecond Pulsar Population – Implications for the Galactic Center Excess” (Chris Gordon, University of Canterbury)	August 2021
	Interview with <a href="#">The Scientist Reach Out Group</a> – recording available <a href="#">here</a>	2022
	Presentation at the Berkeley High School Physics Club – recording available <a href="#">here</a>	2021
	Organizer of and Presenter at “Meet a Miller Fellow,” El Cerrito High School	2020-2021
	Adopt-a-Physicist	2020
	Presentation to PHYS 153 transfer students, UC Berkeley	2020
REFERENCES	<b>Tracy Slatyer</b> Massachusetts Institute of Technology	<a href="mailto:tslatyer@mit.edu">tslatyer@mit.edu</a>
	<b>Benjamin Safdi</b> University of California, Berkeley	<a href="mailto:brsafdi@berkeley.edu">brsafdi@berkeley.edu</a>
	<b>Christian Bauer</b> Lawrence Berkeley National Laboratory	<a href="mailto:cwbauer@lbl.gov">cwbauer@lbl.gov</a>
	<b>Gian Giudice</b> CERN	<a href="mailto:Gian.Giudice@cern.ch">Gian.Giudice@cern.ch</a>
	<b>Hitoshi Murayama</b> University of California, Berkeley	<a href="mailto:hitoshi@berkeley.edu">hitoshi@berkeley.edu</a>
	<b>Marco Cirelli</b> Laboratoire de Physique Théorique et Hautes Énergies	<a href="mailto:marco.cirelli@lpthe.jussieu.fr">marco.cirelli@lpthe.jussieu.fr</a>
	<b>Christoph Weniger</b> University of Amsterdam	<a href="mailto:c.weniger@uva.nl">c.weniger@uva.nl</a>