

Christopher Douglas Tunnell, DPhil

Curriculum Vitae

RESEARCH CONTEXT

I am computational astroparticle physicist who is based in both the departments of physics and computer science. My group connects exciting challenges in physics to cutting-edge computational techniques to enable new types of experimental measurements. Recently, my group addresses the computational challenges of using terrestrial experiments to understand cosmological phenomena, though we have published extensively in the subfields of astroparticle, collider, accelerator, quantum, nuclear, neutrino, computational, and theoretical physics. The information age has fundamentally changed research and created a field called ‘translational computer science’ that – unlike traditional ‘applications research’ with fixed timelines – develops new methodology in tandem between computer science and physics. In 2018, my position was endowed by Rice’s Data Science Initiative to enable this type of translational research. In this role, I stimulate computational research in my department while supporting computational research more broadly in the School. In my research domain, my group has pioneered many aspects ranging from distributed data pipelines to analysis modeling to statistics to machine learning.

RESEARCH POSITIONS

Associate Professor Assistant before 2024	2024–present
William Marsh Rice Trustee Chair (<i>Endowed via Data Science Initiative</i>)	
Department of Physics and Astronomy;	
Department of Computer Science;	
Rice University	
KICP Institute Fellow	2016–2018
Kavli Institute for Cosmological Physics	
University of Chicago	
Postdoctoral Research Associate	2013–2016
Netherlands Institute for Subatomic Physics (Nikhef)	
Research Assistant (<i>Based CERN, Switzerland</i>)	2008–2009
Enrico Fermi Institute	
University of Chicago	
Research Assistant (Part time)	2005–2008
Center for Particles and Fields	
University of Texas at Austin	

EDUCATION

DPhil Particle Physics	2013
University of Oxford, UK	
Supervisor: Dr John Cobb	
‘Sensitivity to electronvolt-scale sterile neutrinos at a 3.8-GeV/c muon decay ring’	
BSc Physics	2008
University of Texas at Austin, USA	
<i>Also Turing Scholar Computer Science Honors Program</i>	

PERSONAL AWARDS, HONORS, EXCEPTIONAL ROLES

National Science Foundation (NSF) CAREER Award	2021
Breakthrough Prize in Fundamental Physics (prize to each SNO Collaborator)	2016
National Energy Research Scientific Computing Center (NERSC) John C. Polanyi Award	2006

GROUP AWARDS, HONORS, EXCEPTIONAL ROLES

APS-Texas Best Presentation, Shixiao Liang	2022
XENON Excellence Awards, Petr Shagin and Junji Naganoma	2021
NSF Graduate Research Fellowship, Honorable Mention, Ivy Li	2021
NSF Graduate Research Fellowship, Awardee, Luis Sanchez	2021
Rice Wagoner Scholarship, Ivy Li	2021
Fulbright Scholarship, Ivy Li	2021
IRIS-HEP Fellow, Awardees, Xiongfeng Song ('20), Bo Zheng ('20), Zoe Bilodeau ('22)	2020, 2022
DOE NNSA Stockpile Stewardship Fellowship, Sophia Farrell (née Andaloro)	2020
NSF Graduate Research Fellowship, Awardee, Sophia Farrell (née Andaloro)	2020
Departmental Summer Undergraduate Research Fellowship, 10 Awardees	2019–present
University Summer Undergraduate Research Fellowship, Awardee, Charles Dyll	2021

SERVICE AND LEADERSHIP

<i>Rice University AI Subcommittee on Ethical AI, Member</i> Subcommittee advises the President on AI Ethics.	2025–present
<i>Rice University AI Committee, Natural Sciences Representative</i> Scope includes impact of AI on teaching, research, and the University. Advises the President.	2024–present
<i>XLZD Software and Computing, Co-organizer</i> With Stanford's SLAC, we organize the computational side for this next generation experiment.	2022–present
<i>Associate Vice President Research Computing Search Committee, Member</i> Rice University	2022
<i>Senate appropriations review of NSF</i> The US Senate's Appropriations Committee visited Gran Sasso National Laboratory to review the National Science Foundation (NSF). I represented XENON for NSF.	2022
<i>McMurtry College, Faculty Associate</i> Rice University's version of Oxbridge Colleges	2021–present
<i>Faculty Advisory Board, Member</i> Ken Kennedy Institute, Rice University	2020–2024
<i>Data Science Education Working Group, Co-Chair</i> Tied to an NSF-funded Big Data Hub.	2020–2025
<i>XENON Software and Computing Working Group, Lead</i>	2019–present

Departmental Graduate Admissions Committee, Member	2019–present
DANCE Workshops (incl. DANCE ML) Organizing Committee x3	2019–present
XENON Public Relations Team, Member	2018–2024
Grant Reviewer National Science Foundation (USA), European Research Council (EU), NSERC (Canada), National Science Center (Poland)	2018–present
PyHEP, co-organizer	2018–2020
Journal Reviewer Physical Review Letters, Physical Review D, Journal of Instrumentation, and Frontiers.	2016–present
XENON Collaboration Board, Member <i>Ex-situ</i> before 2018.	2015–present
XENON1T Analysis, Coordinator	2015–2017

FUNDING

Total funding since 2018: \$3,623,662 for which I had spending authority and reporting requirements, where an additional \$1,118,677 is not listed below and was given to collaborators and Co-PIs. Roughly \$2,000,000 of gaseous xenon (at current prices) and other equipment is not included.

Probabilistic Event Detection at the Cosmic Frontier Co-PI of Department of Energy's AI+HEP institute program at SLAC	2023
WoU-MMA: Collaborative Research: A Next-Generation SuperNova Early Warning System for Multimessenger Astronomy Co-PI of collaborative research award. National Science Foundation.	2022
Collaborative Research: NSF-BSF: Continuation of the XENON Program at LNGS Co-PI of collaborative research award. National Science Foundation.	2021
CAREER: Pivoting XENONnT to Neutrinos and Anomaly Resolution PI of single investigator award. National Science Foundation	2021
AGEP PhD Supplement for Underrepresented Students National Science Foundation.	2020
CC* Compute: Interactive Data Analysis Platform Co-PI for Rice shared equipment GPU cluster. National Science Foundation.	2020
CyberTraining: Implementation: Small: Enabling Dark Matter Discovery through Collaborative Cybertraining Lead PI of collaborative research award. National Science Foundation.	2020
Collaborative Research: Science-Aware Computational Methods for Accelerating Data-Intensive Discovery: Astroparticle Physics as a Test Case Lead PI of multidisciplinary collaborative research award. National Science Foundation.	2019

Computational Dark Matter Detection Workshop

2019

PI of single investigator internal award. Rice's Creative Ventures workshop fund.

Can AI see Dark Matter with self-organizing maps?

2019

Lead PI of three-faculty multidisciplinary internal award. Rice's Creative Ventures IDEA fund.

SENIOR GROUP MEMBERS

Dr Juehang Qin , Physics Postdoctoral Research	2023–present
Dr. Dorian Praia-do-amaral , Physics Postdoctoral Researcher	2022–2025
Prof Aaron Higuera , Assistant Research Professor of Physics and Astronomy	2020–2024
Dr Yossi Mosbacher , Research Software Engineer	2023–2024
Dr Peter Gaemers , Physics Postdoctoral Research (<i>bridge job</i>)	2023
Dr Christina Peters , Computer Science Postdoctoral Researcher	2020–2023
Prof Petr Chaguine , Associate Research Professor of Physics and Astronomy	2018–2021
Dr Junji Naganoma , Physics Postdoctoral Researcher	2018–2020

GRADUATE STUDENTS

Ivy Li	2020–present	Sophia Andalaro, MSc	2019–2022
Luis Sanchez	2019–present	Bo Zheng, MCS	2020
Shixiao Liang, PhD	2019–2025	Xiongfeng Song, MCS	2020

UNDERGRADUATES

Naija Bruckner [P&A]	2025–present	Prathik Boyella [P&A]	2022
Yitang Chen [P&A]	2025–present	Charles Dyall [P&A]	2021
Alex Upton [P&A]	2023–2024	Ayush Sachdeva [P&A]	2021
Emily Huynh [CS]	2023	Chloe Liebenthal [P&A]	2020–2021
Xinze Feng [P&A]	2023.	Yvette Martinez [CS]	2020–2022
Sanya Arora [P&A]	2022–2025	Mirella Vassilev [P&A, Thesis]	2020–2021
Eric Cai [P&A]	2022–2024	Alejandro Oranday [P&A, Thesis]	2019–2021
Rebecca Zadeck [P&A]	2022–2024	Diep Hoang [CS]	2020–2021
Zoe Bilodeau [CS, Skidmore]	2022–2023	Yiyang ‘Skylar’ Xu [CS]	2020
Jason Lee [CS]	2022–2023	Yingfan Chen [CS]	2020
Kexin Shen [P&A]	2022–2023	Shuaicheng ‘Sam’ Li [ECE]	2020

RICE TEACHING

PHYS 449/549. Projects in data-enabled physics through data science and machine learning	202{1,2,5}
PHYS 201. Physics: Waves, optics, and thermodynamics	2020
DSCI 400. Data science and machine learning self-guided capstone laboratory	2020
COMP 490. Undergraduate research in computer science	2020–2024
PHYS 800. Graduate research in physics	2019–present
PHYS 600. Advanced topics in physics	2019

INVITED TALKS SINCE DOCTORATE

Topics in Astroparticle and Underground Physics (TAUP¹) 2025	08-2025
‘First Search for Ultralight Dark Matter Using a Magnetically Levitated Particle’	
University of Delhi	04-2024
‘Lectures on AI and Particle Physics’	
XLZD Meeting at UCLA Dark Matter	04-2023
‘Minimal Computational Infrastructure to Support the Design Study’	

¹A top conference in my field.

Indiana University Bloomington Particle Physics Seminar 'Data-intensive Detection of Dark Matter'	11-2022
Carnegie Mellon University Physics and AI Seminar 'Domain-informed Machine Learning for Direct Detection Dark Matter'	09-2022
Rice University Statistics Colloquium 'How domain knowledge and symmetries are used in data-intensive astroparticle physics'	02-2022
SNOWMASS Workshop on Software and Computing for Small Experiments 'Review of Pertinent Developments in Machine Learning for Small Experiments'	11-2021
First MODE Workshop on Differentiable Programming 'Dark matter and its ML-enhanced direct detection' Machine-learning Optimized Design of Experiments (MODE) Meeting in Université catholique de Louvain	08-2021
Fermilab HEP Seminar 'The XENON1T Electronic Recoil Excess'	04-2021
Michigan State University Physics Colloquium 'The XENON1T Electronic Recoil Excess'	03-2021
Baylor University Physics Colloquium 'The XENON1T Electronic Recoil Excess'	03-2021
University of Liverpool Physics Seminar 'The XENON1T Electronic Recoil Excess'	02-2021
Accelerator Artificial Intelligence For Big-Data Experiments Conference 'Data-Intensive Discovery Accelerated by Computational Techniques for Science (DIDACTS)' Hosted by National Center for Supercomputing Applications	11-2020
MIT Nuclear and Particle Physics Colloquium 'The XENON1T Excess and How Graph Neural Networks Fit In'	11-2020
University of Texas at Austin Particle and Fields Seminar 'The XENON1T Electronic Recoil Excess'	09-2020
CERN Experimental Physics Seminar 'The XENON1T Electronic Recoil Excess'	09-2020
Sam Houston State Physics Colloquium 'The XENON Underground Dark-Matter Telescope'	11-2019
Joint ECFA NuPECC ApPEC Seminar (JENAS) 'HSF/JENAS: points on common challenges and needs: Astroparticle Experiment'	11-2019
IRIS-HEP Dark Matter Meeting 'XENON challenges and uniqueness thereof'	11-2019
Texas A&M Seminar 'The XENON Dark Matter Detector Highlights'	10-2019
nEXO Collaboration Seminar 'XENON Software Philosophy'	10-2019

<i>SuperCDMS Science Seminar Series</i> 'The XENON Dark Matter Detector Highlights'	10-2019
<i>PASCOS 2019 Particle physics, String theory and Cosmology</i> 'The XENON Dark Matter Detector Highlights' in Manchester, UK	07-2019
<i>HEP Software Foundation OSG WLSG (HOW) Workshop</i> 'Review of Software in Dark Matter Community' in Jefferson Lab, Newport, Virginia	07-2019
<i>Computing in High Energy Physics (CHEP)</i> 'Manifold Learning and the Cosmic Frontier' at Sofia, Bulgaria	07-2018
<i>PyHEP</i> 'XENON Software Stack' at Sofia, Bulgaria	07-2018
<i>G3 Experiment Workshop</i> 'Computational R&D' at Texas A&M in College Station, Texas, USA	03-2018
<i>Lorentz Center on Dark Matter and Machine Learning</i> 'Machine Learning in Direct Detection' at Leiden University, the Netherlands	01-2018
<i>Lomonosov Conference on Elementary Particle Physics</i> 'First XENON Results' in Moscow, Russia	08-2017
<i>SLAC National Accelerator Laboratory's Summer Institute Lecture</i> 'First XENON Results' in Palo Alto, California	08-2017
<i>Kavli Institute for Cosmological Physics' Seminar</i> 'First XENON Results' in Chicago, Illinois	05-2017
<i>HEP Software Foundation Workshop</i> 'Python Zealotry on the Cosmic Frontier' in Amsterdam, the Netherlands.	05-2017
<i>Veldhoven Physics Conference</i> 'Hitting Dark Matter with Xenon' in Veldhoven, the Netherlands.	01-2015
<i>Münster University Physics Seminar</i> 'The XeNu experiment: moving XENON100 to a neutrino beam' in Münster, Germany.	06-2015
<i>SUSY Conference</i> 'XENON100/XENON1T' in Lake Tahoe, US.	06-2015
<i>Dark Matter at the LHC</i> 'Direct Detection of Dark Matter' in Oxford, United Kingdom.	2014
<i>International Workshop on Neutrino Telescopes</i> 'Resolving Sterile Neutrino Anomaly with nuSTORM' in Venice, Italy.	2013

PEER-REVIEWED PUBLICATIONS

Please note that these papers span multiple fields with different authorship ordering and types of venues where people publish. For an online overview, my field uses iNSPIRE-HEP and you can view my [profile here](#).

Mechanical Sensors for Ultraheavy Dark Matter Searches via Long-range Forces 2025

Reference: [[arXiv:2503.11645](#)]

Authors: Qin, Juehang; Amaral, Dorian W.P.; Bhawe, Sunil A.; Cai, Erqian; Carney, Daniel; Lang, Rafael F.; Li, Shengchao; Marino, Alberto M.; Marvinney, Claire; Newton, Jared R.; Taylor, Jacob M.; Tunnell, Christopher

The MORRIS Experiment: Magnetic Levitation as a New Probe of Non-Newtonian Gravity 2025

Reference: [[arXiv:2506.17385](#)]

Authors: Amaral, ..., Tunnell, et al (MORRIS Collaboration)

Challenging Spontaneous Quantum Collapse with XENONnT 2025

Reference: [[arXiv:2506.05507](#)]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

WIMP Dark Matter Search using a 3.1 tonne \times year Exposure of the XENONnT Experiment 2025

Reference: [[arXiv:2502.18005](#)]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

FlowVAT: Normalizing Flow Variational Inference with Affine-Invariant Tempering 2025

Reference: [[arXiv:2505.10466](#)]

Authors: Qin, Juehang; Tunnell, Christopher

Low-Energy Nuclear Recoil Calibration of XENONnT with a ^{88}YBe Photoneutron Source 2024

Reference: Accepted PRD [[arXiv:2412.10451](#)]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

Radon Removal in XENONnT down to the Solar Neutrino Level 2025

Reference: Accepted Phys. Rev. X on 5 August, 2025 [[arXiv:2502.04209](#)]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

Search for Light Dark Matter in Low-Energy Ionization Signals from XENONnT 2025

Reference: Phys. Rev. Lett. 134, 161004 (2025) [[arXiv:2411.15289](#)]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

First Search for Light Dark Matter in the Neutrino Fog with XENONnT 2025

Reference: Phys. Rev. Lett. 134, 111802 (2025) [[arXiv:2409.17868](#)]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

Neutrino interaction vertex reconstruction in DUNE with Pandora deep learning 2025

Reference: Eur.Phys.J.C 85 (2025) no.697, 697 [[arXiv:2502.06637](#)]

Authors: Abud, ..., Tunnell, et al (DUNE Collaboration)

The neutron veto of the XENONnT experiment: results with demineralized water 2025

Reference: Eur.Phys.J.C 85 (2025) no.6, 695 [[arXiv:2412.05264](#)]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

- XENONnT WIMP Search: Signal & Background Modeling and Statistical Inference*** 2024
 Reference: Phys.Rev.D 111 (2025) no.10, 103040 [[arXiv:2406.13638](#)]
 Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)
- Neutrinoless Double Beta Decay Sensitivity of the XLZD Rare Event Observatory*** 2024
 Reference: J.Phys.G 52 (2025) no.4, 045102 [[arXiv:2410.19016](#)]
 Authors: Aalbers, ..., Tunnell, et al (XLZD Collaboration)
- The XLZD Design Book: Towards the Next-Generation Liquid Xenon Observatory for Dark Matter and Neutrino Physics*** 2024
 Reference: [[arXiv:2410.17137](#)]
 Authors: Aalbers, ..., Tunnell, et al (XLZD Collaboration)
- Fast Bayesian inference for neutrino non-standard interactions at dark matter direct detection experiments*** 2024
 Reference: Accepted IOP Machine Learning: Science and Technology [[arXiv:2405.14932](#)]
 Authors: Amaral, Dorian W.P.; Liang, Shixiao; Qin, Juehang; Tunnell, Christopher
- Offline tagging of radon-induced backgrounds in XENON1T and applicability to other liquid xenon detectors*** 2024
 Reference: Phys.Rev.D 110 (2024) 1, 012011 [[arXiv:2403.14878](#)]
 Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)
- The SNEWS 2.0 Alert Software for the Coincident Detection of Neutrinos from Core-Collapse Supernovae*** 2024
 Reference: JINST 19 (2024) no.10, P10017 [[arXiv:2406.17743](#)]
 Authors: Kara, M.; Torres-Lara, S.; Baxter-Depoian, A.; BenZvi, S.; Colomer Molla, M.; Habig, A.; Kneller, J.P.; Lai, M.; Lang, R.F.; Linvill, M.; Milisavljevic, D.; Migenda, J.; Orr, C.; Scholberg, K.; Smolsky, J.; Tseng, J.; Tunnell, C.D.; Vasel, J.; Sheshukov, A.
- The DUNE Far Detector Vertical Drift Technology. Technical Design Report*** 2024
 Reference: JINST 19 (2024) no.08, T08004 [[arXiv:2312.03130](#)]
 Authors: Abed Abud, ..., Tunnell, et al (DUNE Collaboration)
- XENONnT Analysis: Signal Reconstruction, Calibration and Event Selection*** 2024
 Reference: Phys.Rev.D 111 (2025) no.6, 062006 [[arXiv:2409.08778](#)]
 Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)
- First Search for Ultralight Dark Matter Using a Magnetically Levitated Particle*** 2024
 Reference: [[arXiv:2409.03814](#)]
 Authors: Amaral, Dorian W.P.; Uitenbroek, Dennis G.; Oosterkamp, Tjerk H.; Tunnell, Christopher D.
- Approximate Differentiable Likelihoods for Astroparticle Physics Experiments*** 2024
 Reference: ACAT Proceedings 2024 [[arXiv:2408.09057](#)]
 Authors: Qin, Juehang; Tunnell, Christopher
- Vector wave dark matter and terrestrial quantum sensors*** 2024
 Reference: JCAP 06 (2024) 050 [[arXiv:2403.02381](#)]
 Authors: Amaral, D. W. P.; Jain, M.; Amin, M. A.; Tunnell, C.
- Design and performance of the field cage for the XENONnT experiment*** 2024
 Reference: Eur.Phys.J.C 84 (2024) 2, 138 [[arXiv:2309.11996](#)]
 Authors: Aprile, ..., Tunnell, et al (XENONnT Collaboration)
- Handling Detector Characterization Data (Metadata) in XENONnT*** 2023
 Reference: EPJ Web Conf. 295 (2024) 01033
 Sanchez, L.; Mosbacher, Y.; Higuera, A.; Tunnell, C.D.

- Fast Integration of Poisson Distributions for Dead Sensor Marginalization*** 2023
 Reference: EPJ Web Conf. 295 (2024) 03013
 Bilodeau, Z.; Peters, C.; Tunnell, C.D.
- Energy Reconstruction with Semi-Supervised Autoencoders for Dual-Phase Time Projection Chamber*** 2023
 Reference: EPJ Web Conf. 295 (2024) 0902
 Li, I; Higuera, A.; Liang, S.; Qin, J.; Tunnell, C.D.
- A NodeJS application for XENON collaboration member management*** 2023
 Reference: EPJ Web Conf. 295 (2024) 08002
 Lee, J.; Liang, S.; Martinez, Y.; Tunnell, C.D.
- SOM-based Classification and a Novel Stopping Criterion for Astroparticle Applications*** 2023
 Reference: Proceeding of 31st ESAAN [[link](#)]
 Authors: Sanchez, L.; Merényi, E.; Tunnell, C.D.
- The triggerless data acquisition system of the XENONnT experiment*** 2023
 Reference: JINST 18 (2023) no.07, P07054 [[arXiv:2212.11032](#)]
 Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)
- First Dark Matter Search with Nuclear Recoils from the XENONnT Experiment*** 2023
 Reference: Phys. Rev. Lett. 131, 041003 (2023) [[arXiv:2303.14729](#)]
 Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)
- Detector signal characterization with a Bayesian network in XENONnT*** 2023
 Reference: Phys. Rev. D 108, 012016 (2023) [[arXiv:2304.05428](#)]
 Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)
- Searching for Heavy Dark Matter near the Planck Mass with XENON1T*** 2023
 Reference: Phys. Rev. Lett. 130, 261002 (2023) [[arXiv:2304.10931](#)]
 Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)
- Learning Optical Map in Liquid Xenon Detector with Poisson Likelihood Loss*** 2023
 Reference: NeurIPS Machine Learning & Physical Sciences Workshop [[link](#)]
 Authors: Liang, S.; Tunnell, C.D.
- Cosmogenic background simulations for the DARWIN observatory at different underground locations*** 2023
 Reference: [[arXiv:2306.16340](#)]
 Authors: Adrover, ..., Tunnell, et al (DARWIN Collaboration)
- Low-energy calibration of XENON1T with an internal ^{37}Ar source*** 2023
 Reference: Eur.Phys.J.C 83 (2023) no.6, 542 [[arXiv:2211.14191](#)]
 Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)
- Search for events in XENON1T associated with Gravitational Waves*** 2023
 Reference: [[arXiv:2306.11871](#)]
 Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)
- A next-generation liquid xenon observatory for dark matter and neutrino physics*** 2022
 Reference: J.Phys.G 50 (2023) no.1, 013001 [[arXiv:2203.02309](#)]
 Authors: Aalbers, ..., Tunnell, et al

Graphical Models are All You Need: Per-interaction reconstruction uncertainties in a dark matter detection experiment 2022

Reference: [NeurIPS AI4Science #84]

Authors: Peters, Christina; Higuera, Aaron; Liang, Shixiao; Roy, Venkat; Bajwa, Waheed; Shatkay, Hagit; Tunnell, Christopher D.

A Review of NEST Models, and Their Application to Improvement of Particle Identification in Liquid Xenon Experiments 2022

Reference: Front.Detect.Sci.Tech. 2 (2024) 1480975 [arXiv:2211.10726]

Authors: Szydagis, ..., Tunnell, et al

An approximate likelihood for nuclear recoil searches with XENON1T data 2022

Reference: Eur.Phys.J.C 82 (2022) no.11, 989 [arXiv:2210.07231]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

Effective Field Theory and Inelastic Dark Matter Results from XENON1T 2022

Reference: Phys.Rev.D 109 (2024) no.11, 112017 [arXiv:2210.07591]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

Search for New Physics in Electronic Recoil Data from XENONnT 2022

Reference: Phys. Rev. Lett. 129, 161805 (2022) [arXiv:2207.11330]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

Double-Weak Decays of ^{124}Xe and ^{136}Xe in the XENON1T and XENONnT Experiments 2022

Reference: Phys. Rev. C 106, 024328 (2022) [arXiv:2205.04158]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

GPU-based optical simulation of the DARWIN detector 2022

Reference: JINST 17 (2022) no.07, P07018 [arXiv:2203.14354]

Authors: Althueser, ..., Tunnell, et al (DARWIN Collaboration)

Material radiopurity control in the XENONnT experiment 2022

Reference: Eur.Phys.J.C 82 (2022) no.7, 599 [arXiv:2112.05629]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

Emission of single and few electrons in XENON1T and limits on light dark matter 2022

Reference: Phys. Rev. D 106, 022001 (2022) [arXiv:2112.12116]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

Collaborative Experience between Scientific Software Projects using Agile Scrum Development 2022

Reference: Software Pract.Exper. 52 (2022) no.10, pg. 2077 [arXiv:2101.07779]

Authors: Baxter, ..., Tunnell, et al (SCiMMA Collaboration)

Domain-Informed Neural Networks for Interaction Localization Within Astroparticle Experiments 2022

Reference: Front.Artif.Intell. 5 (2022) 832909 [arXiv:2112.07995]

Authors: Liang, Shixiao; Higuera, Aaron; Peters, Christina; Roy, Venkat; Bajwa, Waheed U.; Shatkay, Hagit; Tunnell, Christopher D.

Application and modeling of an online distillation method to reduce krypton and argon in XENON1T 2022

Reference: PTEP 2022 (2022) no.5, 053H01 [arXiv:2112.12231]

Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)

- A Method for Quantifying Position Reconstruction Uncertainty in Astroparticle Physics using Bayesian Networks*** 2022
 Reference: [arXiv:2205.10305]
 Authors: Peters, Christina; Higuera, Aaron; Liang, Shixiao; Roy, Venkat; Bajwa, Waheed U.; Shatkay, Hagit; Tunnell, Christopher D.
- Software and Computing for Small HEP Experiments*** 2022
 Reference: FERMILAB-CONF-22-138 [arXiv:2203.07645]
 Authors: Casper, ..., Tunnell, et al
- Snowmass 2021 White Paper: The Windchime Project*** 2022
 Reference: unpublished [arXiv:2203.07242]
 Authors: Attanasio, ..., Tunnell, et al (Windchime Collaboration)
- SNEWPY: A Data Pipeline from Supernova Simulations to Neutrino Signals*** 2022
 Reference: Astrophys.J. 925 (2022) no.2, 107 [arXiv:2109.08188]
 Authors: Baxter, ..., Tunnell, et al (SNEWS Collaboration)
- SNEWPY: A Data Pipeline from Supernova Simulations to Neutrino Signals*** 2021
 Reference: Journal of Open Source Software, 6(67), 3772
 Authors: C. Tunnell and 25 others within the SNEWS Collaboration
- Model-independent searches of new physics in DARWIN with a semi-supervised deep learning pipeline*** 2024
 Reference: [arXiv:2410.00755]
 Authors: Aalbers, ..., Tunnell, et al (DARWIN Collaboration)
- ²²²Rn emanation measurements for the XENON1T experiment*** 2021
 Reference: Eur.Phys.J.C 81 (2021) no.4, 337 [arXiv:2009.13981]
 Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)
- Search for inelastic scattering of WIMP dark matter in XENON1T*** 2021
 Reference: Phys. Rev. D 103, 063028 (2021) [arXiv:2011.10431]
 Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)
- SNEWS 2.0: a next-generation supernova early warning system for multi-messenger astronomy*** 2021
 Reference: New J.Phys. 23 (2021) no.3, 031201 [arXiv:2011.00035]
 Authors: Al Kharusi, ..., Tunnell, et al (SNEWS Collaboration)
- Search for Coherent Elastic Scattering of Solar ⁸B Neutrinos in the XENON1T Dark Matter Experiment*** 2021
 Reference: Phys. Rev. Lett. 126, 091301 (2021) [arXiv:2012.02846]
 Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)
- Solar neutrino detection sensitivity in DARWIN via electron scattering*** 2020
 Reference: Eur.Phys.J.C 80 (2020) no.12, 1133 [arXiv:2006.03114]
 Authors: Aalbers, ..., Tunnell, et al (DARWIN Collaboration)
- The XENONnT dark matter experiment*** 2024
 Reference: Eur.Phys.J.C 84 (2024) no.8, 784 [arXiv:2402.10446]
 Authors: Aprile, ..., Tunnell, et al (XENON Collaboration)
- A Review on Machine Learning for Neutrino Experiments*** 2020
 Reference: Int.J.Mod.Phys.A 35 (2020) no.33, 2043005 [arXiv:2008.01242]
 Authors: Psihas, Fernanda; Groh, Micah; Tunnell, Christopher; Warburton, Karl

- Projected WIMP sensitivity of the XENONnT dark matter experiment*** 2020
 Reference: JCAP11(2020)031 [[arXiv:2007.08796](#)]
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