Tony Menzo

University of Cincinnati — Geology/Physics Building
345 Clifton Ct, Cincinnati, OH 45220

Email: amenzo@ua.edu
INSPIRE: https://inspirehep.net/authors/2049582

Current position

Sep. 2025 – Present —*Postdoctoral fellow, Particle Theory and Phenomenology*
Fermi National Accelerator Laboratory and the University of Alabama

Education

2020 – 2025 — Ph.D. in Physics, University of Cincinnati
Advisor: Jure Zupan, PhD

2014 – 2019 — Bachelor of Arts and Sciences in Physics, The Ohio State University
Minors in Earth Science (Geophysics) and Philosophy
Mentor: Stuart Raby, PhD

Areas of Specialization and Interest

High Energy Physics — Phenomenology
Model building, computational physics (machine learning, optimal transport), hadronization, rare lepton decays, effective field theory, proton decay, hierarchy problem, gauge/gravity duality, cosmology

Publications/Preprints

1. July 2025 – Benoit Assi, Christian Bierlich, Phil Ilten, **Tony Menzo**, Stephen Mrenna, Manuel Szwec, Michael Wilkinson, Ahmed Youssef, Jure Zupan, "Posthoc reweighting of hadron production in the Lund string model" Submitted to SciPost Physics. [arXiv:2505.00142]

2. March 2025 — Innes Bigaran, Patrick Fox, Yann Gouttenoire, Roni Harnik, Gordan Krnjaic, **Tony Menzo**, Jure Zupan, "Direct detection of ultralight dark matter via charged lepton flavor violation" Submitted to PRL. [arXiv:2503.07722]

3. March 2025 — Benoit Assi, Christian Bierlich, Phil Ilten, **Tony Menzo**, Stephen Mrenna, Manuel Szwec, Michael Wilkinson, Ahmed Youssef, Jure Zupan, "Characterizing the hadronization of parton showers using the HOMER method" Submitted to SciPost Physics. [arXiv:2503.05667]

4. February 2025 — Chaja Baruch, Patrick Fitzpatrick, **Tony Menzo**, Yotam Soreq, Sokratis Trifinopoulos, Jure Zupan, "Searching for exotic scalars at fusion reactors" To be published in JHEP. [arXiv:2502.12314]

5. November 2024 — Nick Heller, Phil Ilten, **Tony Menzo**, Stephen Mrenna, Benjamin Nachman, Andrzej Siodmok, Manuel Szewc, Ahmed Youssef, "Rejection Sampling with Autodifferentiation – Case study: Fitting a Hadronization model" Submitted to Physical Review D. [arXiv:2411.02194]

6. September 2024 — Christian Bierlich, Phil Ilten, **Tony Menzo**, Stephen Mrenna, Manuel Szwec, Michael Wilkinson, Ahmed Youssef, Jure Zupan, "Describing Hadronization via Histories and Observables for Monte Carlo Event Reweighting." Submitted to SciPost Physics. [arXiv:2410.06342]

7. July 2024 — Patrick J. Fox, Matheus Hostert, **Tony Menzo**, Maxim Pospelov, Jure Zupan, "Muon-induced baryon number violation." Phys.Rev.D 110 (2024) 7, 075015. [arXiv:2407.03450]

8. June 2024 — Wick Haxton, Kenneth McElvain, **Tony Menzo**, Evan Rule, Jure Zupan, "Effective theory tower for $\mu \to e$ conversion." JHEP 11 (2024) 076. [arXiv:2406.13818]

9. November 2023 — Christian Bierlich, Phil Ilten, **Tony Menzo**, Stephen Mrenna, Manuel Szwec, Michael Wilkinson, Ahmed Youssef, Jure Zupan, "Towards a data-driven model of hadronization using normalizing flows." SciPost Physics 17.2 (2024): 045. [arXiv:2311.09296]

10. August 2023 — Christian Bierlich, Phil Ilten, **Tony Menzo**, Stephen Mrenna, Manuel Szwec, Michael Wilkinson, Ahmed Youssef, Jure Zupan, "Reweighting Monte Carlo Predictions and Automated Fragmentation Variations in Pythia 8." SciPost Physics 16.5 (2024): 134. [arXiv:2308.13459]

11. June 2023 — Matheus Hostert, **Tony Menzo**, Maxim Pospelov, Jure Zupan, "New physics in multi-electron muon decays." Journal of High Energy Physics 2023.10 (2023): 1-22. [arXiv:2306.15631]

12. January 2023 — Adam Davis, **Tony Menzo**, Ahmed Youssef, Jure Zupan, "The earth mover's distance as a measure of CP violation." Journal of High Energy Physics 2023.6 (2023): 1-42. [arXiv:2301.13211]

13. April 2022 — Reuven Balkin, Eric Madge, **Tony Menzo**, Gilad Perez, Yotam Soreq, Jure Zupan, "On the implications of positive W mass shift." Journal of High Energy Physics 2022.2204.05992 (2022): 1-19. [arXiv:2204.05992]

14. March 2022 — Phil Ilten, **Tony Menzo**, Ahmed Youssef, Jure Zupan, "Modeling hadronization using machine learning". SciPost Physics, 14(3), 027 (2023). [arXiv:2203.04983]

In preparation:

- "A flavorful and dark cascade for low-scale leptogenesis"

Awards

October 2024 – August 2025 — URA Visiting Scholar's Program awardee, Fermi National Accelerator Laboratory, *"Time-dependent signals at the intensity frontier"* (1 month)

April 2024 – July 2024 — URA Visiting Scholar's Program awardee, Fermi National Accelerator Laboratory, *"Exploring exotic signatures at Mu2e"* (3 months)

October 2023 – April 2024 — DOE SCGSR fellowship recipient, Lawrence Berkeley National Lab, *"Connecting small and large scales at muon-to-electron conversion experiments"* (6 months)

January 2023 — University of Cincinnati Physics poster competition, 1st place

April – August 2022 — Technion - Israel Institute of Technology visiting research student: Sandwich Scholarship (3 months)

Presentations

June 2025 — NPN, University of Cincinnati, Cincinnati, OH
June 2025 — FPCP, University of Cincinnati, Cincinnati, OH
May 2025 — Pythia week, Lund University, Lund, Sweden
May 2025 — LULBI, Weizmann Institute, Rehovot, Israel
April 2025 — PIKIMO, University of Kentucky, Lexington, KY
November 2024 — UMD EPT Seminar, University of Marlyand, Annapolis, MD
November 2024 — Rutgers NHETC Seminar, Rutgers University, Piscataway, NJ
November 2024 — Cornell LEPP Theory Seminar, Cornell University, Ithaca, NY
October 2024 — SLAC Theory Seminar, SLAC, Menlo Park, CA
October 2024 — UCSD Particle Theory Seminar, UC San Diego, San Diego, CA
October 2024 — UCSB HEP-HEX Seminar, UC Santa Barbara, Santa Barbara, CA
September 2024 — NuFact 2024, Argonne National Laboratory, Chicago, IL
May 2024 — Phenomenology 2024, University of Pittsburgh, Pittsburgh, PA
February 2024 — Berkeley 4D Seminar, UC Berkeley, Berkeley, CA
October 2023 — ATLAS Theory Lunch Seminar, LBNL, Berkeley, CA
September 2023 — IAIFI Journal Club, MIT, Boston, MA

May 2023 — Phenomenology 2023, University of Pittsburgh, Pittsburgh, PA
April 2023 — PIKIMO conference, Ohio State University, Columbus, OH
March 2023 — DIS2023 workshop, Michigan State University, East Lansing, Michigan
November 2022 — QCD@LHC workshop, Paris-Saclay University, Orsay, France
November 2022 — PIKIMO conference, University of Cincinnati, Cincinnati, OH
October 2022 — AI4EIC Workshop, online

July 2022 — Rethinking beyond the Standard Model summer school, Institute for Scientific Studies, Cargese, Corsica

May 2022 — Technion HEP Journal Club, Technion - Israel Institute of Technology, Haifa, Israel

Teaching

June 2025 — CTEQ + MCgen summer workshop and training program

Schools

November 2023 — Theory Meets Experiments: The high intensity frontier of particle physics, Galileo Galilei Institute, Florence, Italy

June 2023 — Holography@25, ICTP, Sao Paulo, Brazil

July 2022 — Rethinking beyond the Standard Model Summer school, Institute for Scientific Studies, Cargese, Corsica

October 2021 — School on Superstring Theory and Related Topics (online)
August 2021 — Les Houches 2021: Dark Matter (online)
June 2021 — Pre-strings: Preparatory School for Strings 2021 (online)
June 2021 — ICTP Summer School on Particle Physics (online)
January 2021 — GGI Lectures on Fundamental Interactions (online)