

Fabrizio Vassallo

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Education

- 2024 – Present: **PhD in Physics**
University of Wisconsin–Madison
- 2020 – 2024: **BS in Physics and BA in Mathematics**
Denison University
Thesis: *Understanding Q-balls in two and three dimensions*

Research experience

- 2024 – Present: **Graduate Research Assistant (hep-ph & astro-ph)**
University of Wisconsin–Madison – Advised by [Dan Hooper](#) and [Josh Foster](#)
Exploring prospects for detection at IceCube of neutrino signals generated by annihilating WIMP dark matter accumulated in the Sun.
- 2023 – 2024: **Senior Thesis Work (hep-th)**
Brigham Young University – Advised by [Christopher Verhaaren](#)
Studied Q-balls, objects that appear in candidate theories of dark matter and baryogenesis, characterizing their behavior under rotation.
- 2021 – 2023: **Undergraduate Research Assistant (atom-ph)**
Denison University – Advised by [Wesley Walter](#)
Worked with Prof. Wesley Walter on the negative-ion spectroscopy of lead, lanthanum, and more, including work at DESIREE in Stockholm, Sweden.

Teaching experience

- Aug 2024 – May 2025: **Graduate Teaching Assistant**
University of Wisconsin–Madison
Led two discussion and two laboratory sessions for [Physics 207](#), a calculus-based course for biology students that introduces classical mechanics and thermodynamics.
- Aug 2021 – Dec 2023: **Undergraduate Teaching Assistant**
Denison University
Served as a teaching assistant for seven different courses, including Modern Physics, Applied Mathematical Methods, and Introduction to Proofs.

Publications

4. D. Hooper and F. Vassallo, *Searching for dark matter annihilating in the Sun with the IceCube Upgrade*, [Phys. Rev. D **112**, 035014 \(2025\)](#) and [\[arXiv:2505.06734 \[hep-ph\]\]](#)
3. C. V. Verhaaren, F. Vassallo, and B. DeVries, *Understanding Q-balls in two and three dimensions*, Manuscript in preparation.
2. C. W. Walter, F. Vassallo, J. Karls, et al., *Lifetimes of bound excited states of the lanthanum negative ion and implications for laser cooling: Experiment and theory*, Manuscript submitted to Phys. Rev. A.
1. C. W. Walter, F. Vassallo, and N. D. Gibson, *Measurement of the electron affinity of lead and its isotope shifts*, [Phys. Rev. A **106**, L010801 \(2022\)](#).

Other Publications

3. F. Vassallo, *Powerful math: What biology's modern synthesis reveals about the twofold influence of numbers*, [Synthesis](#), [Harvard University](#), **1**, 7 (2023).
2. F. Vassallo, *Science comes to life at PhysCon: Scholarly adventures in Washington, DC.*, [Radiations](#), [AIP](#), **29**, 2 (2023).
1. F. Vassallo, *The calm amidst the storm: A literary nonfiction tale*, [Exile](#), [Denison University](#), **68**, 1 (2022).

Presentations at scientific conferences

- 2025: *Searching for dark matter annihilation in the Sun with the IceCube Upgrade.*
9. Speaker. Lepton Photon 2025. Madison, Wisconsin, USA.
8. Speaker. Intersections of Particle and Nuclear Physics. Madison, Wisconsin, USA.
- 2023: *Slowly-Rotating Q-Balls.*
7. Speaker. APS Eastern Great Lakes Meeting. Cleveland, Ohio, USA.
6. Poster. Denison University Symposium. Granville, Ohio, USA.
- 2022: *Lifetime measurements of excited states of La^- at DESIREE.*
5. Poster. Optica FiO+LS Symposium. Rochester, New York, USA.
4. Poster. PhysCon 2022. Washington DC, USA.
3. Poster. Denison University Symposium. Granville, Ohio, USA.
- 2021: *Measurement of the isotope shifts in the electron affinity of lead.*
2. Speaker. Optica FiO+LS Symposium. Online.
1. Poster. Denison University Symposium. Granville, Ohio, USA.

Leadership and Involvement

Society of Physics Students

Co-president, 2021–2022, Denison University

Organized events to bring the physics community together with fun activities, from decorating the building for Halloween to coordinating a stargazing night with faculty. Recognized by the American Institute of Physics as a Distinguished Chapter.

Selected Honors and Awards

- 2024: [Valedictorian of the Class of 2024](#)
 [Provost's Academic Excellence Award](#)
 [John L. Gilpatrick Award in Mathematics](#)
 [Mike Michelson Research Award in Physics](#)
 [Ronald R. Winters Graduate School Award in Physics](#)
- 2023: [Membership of the Phi Beta Kappa Honor Society \(Junior Early Inductee\)](#)
 [Ben Leslie Experimentalist Award](#)
- 2022: [Chosaburo Kato Memorial Award](#)