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

Physics:

1. D. Hooper and F. Vassallo, *Searching for dark matter annihilating in the Sun with the IceCube Upgrade*, arXiv:2505.06734 [hep-ph]
2. C. V. Verhaaren, F. Vassallo, and B. DeVries, *Understanding Q-balls in two and three dimensions*, Manuscript in preparation.
3. 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 in preparation.
4. 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).

History of science:

5. F. E. Vassallo, *Powerful math: What biology's modern synthesis reveals about the twofold influence of numbers*, *Synthesis*, Harvard University, **1**, 7 (2023).

Others:

6. F. E. Vassallo, *Science comes to life at PhysCon: Scholarly adventures in Washington, DC.*, Radiations, AIP, **29**, 2 (2023).
7. F. E. Vassallo, *The calm amidst the storm: A literary nonfiction tale*, Exile, Denison University, **68**, 1 (2022).

Presentations at scientific conferences

2023:

1. *Slowly-Rotating Q-Balls.*
   Speaker. APS Eastern Great Lakes Meeting. Cleveland, Ohio, USA.
2. *Slowly-Rotating Q-Balls.*
   Poster presentation. Denison University Symposium. Granville, Ohio, USA.

2022:

3. *Lifetime measurements of excited states of La^-.*
   Poster presentation. Optica FiO+LS Symposium. Rochester, New York, USA.
4. *Lifetime measurements of excited states of La^-.*
   Poster presentation. PhysCon 2022. Washington DC, USA.
5. *Lifetime of excited states of La^- at DESIREE.*
   Poster presentation. Denison University Symposium. Granville, Ohio, USA.

2021:

6. *Measurement of the isotope shifts in the electron affinity of lead.*
   Speaker. Optica FiO+LS Symposium. Online.
7. *Measurement of the isotope shifts in the electron affinity of lead.*
   Poster presentation. Denison University Symposium. Granville, Ohio, USA.

Leadership and Involvement

2021 – 2022: **Society of Physics Students**
Co-president, 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