

# Michael Rizzo-Lopez

(previously Michael Rizzo Smith)

## Curriculum Vitae

Nashville, TN — michael.smith.4@vanderbilt.edu — mjosmith.github.io

Computational astrophysicist specializing in hydrodynamic simulations of massive black hole binary dynamics in gaseous accretion disks and predicting their electromagnetic and gravitational-wave signatures for multi-messenger astrophysics.

## EDUCATION

---

**Ph.D Astrophysics** Aug. 2023 - Exp. 2029  
Vanderbilt University Nashville, TN

Department of Physics and Astronomy

Dissertation Title: *“Hydrodynamic Simulations of Relativistic Compact Object Inspirals in Accretion Disks”*

Advisor: *Kelly Holley-Bockelmann*

**Bachelor of Science, Physics and Astronomy & Planetary Science** Aug. 2017 - May 2021  
Stony Brook University Stony Brook, NY

Department of Physics and Astronomy

*Magna Cum Laude with Honors in Physics*

## PROFESSIONAL WORK AND AFFILIATIONS

---

**NASA XRP 2026 Review Panel**, Executive Secretary Mar. 2026

**LISA Consortium**, Core Member May 2025 - Present

**Vanderbilt’s Graduate Student Astrophysics Journal Research Club**,  
Co-Coordinator Jan. 2025 - Present

Rebuilt existing club structure to emphasize practical presentation skills and implemented a formal faculty feedback structure.

**LISA Disc-IMRI Project Astrophysics Working Group**, Code Captain Dec. 2023 - Dec. 2025

**Establishing Multimessenger Astronomy Inclusive Training (EMIT)**,  
Graduate Student Scholar Sep. 2023 - Present

**ASAS-SN Project**, Data Analyst Jun. 2021 - July 2023

Research Assistant for the All Sky Automated Survey for Supernovae at The Ohio State University.

## AWARDS AND FELLOWSHIPS

---

NASA CRESST II LISA Symposium Travel Award (*\$1,500*) Apr. 2026

NSF Graduate Research Fellow (*\$150,000*) Jun. 2025

Vanderbilt Graduate School Travel Grant (*\$1,000*) July 2024

McMinn Research Award (*\$2,000*) May 2024

Vanderbilt Robert T. Lagemann Award (*\$3,500*) Apr. 2024

Departmental Honors, Dept. of Physics May 2021

Stony Brook Campus Scholarship (*\$26,000*) Aug. 2017 - May 2021

## PRESENTATIONS

---

**Contributed Talk**, Vanderbilt’s Astrophysics Journal Research Club Nov. 2025

Presenting: *“Relativistic Binary Precession: Impact on Eccentric Massive Binary Black Hole Accretion and Hydrodynamics”*

**Contributed Talk**, Vanderbilt’s Astrophysics Journal Research Club Jan. 2025

Presenting: *“The dynamics and electromagnetic signatures of accretion in unequal mass binary black hole inspirals”*

**Contributed Talk**, The 15th International LISA Symposium July 2024

Presenting on behalf of the Disc-IMRI Code Comparison LISA Astrophysics Working Group

## PUBLICATIONS

---

### Reviewed Articles

(1 first-author, 5 co-author, 141 citations)

1. Andrea Derdzinski, Alexander J. Dittmann, Alessia Franchini, Alessandro Lupi, Noé Brucy, Pedro R. Capelo, Frédéric S. Masset, Raphaël Mignon-Risse, **Michael Rizzo Smith**, Edwin Santiago-Leandro, Martina Toscani, David A. Velasco-Romero, Robert Wissing, Mudit Garg, Lucio Mayer, Roberto Serafinelli, Lazaros Souvatzis, Daniel J. D’Orazio, and

- Jonathan Menu. “The LISA Astrophysics “Disc-IMRI” Code Comparison Project: Intermediate-Mass-Ratio Binaries in AGN-Like Discs”. In: *arXiv e-prints* (Dec. 2025), arXiv:2512.10893. arXiv: 2512.10893 [astro-ph.HE]
- Kelly Holley-Bockelmann, Fazeel Mahmood Khan, Isaiah Williams, Jaelyn Roth, **Rizzo Smith, Michael**, Kaitlin Porter, Jillian Bellovary, Andrea Derdzinski, and Andrea V. Macciò. “Handy Relation between Binary Black Hole Merger Times and Host Galaxy Properties”. In: *Astrophysical Journal Letters* 995.1, L32 (Dec. 2025), p. L32. arXiv: 2508.14253 [astro-ph.GA]
  - J. M. M. Neustadt, C. S. Kochanek, and **Rizzo Smith, M.** “Constraints on pre-SN outbursts from the progenitor of SN 2023ixf using the large binocular telescope”. In: *MNRAS* 527.3 (Jan. 2024), pp. 5366–5373. arXiv: 2306.06162 [astro-ph.HE]
  - Matthew Kenworthy, [20 authors], and **Rizzo Smith, Michael**. “A planetary collision afterglow and transit of the resultant debris cloud”. In: *Nature* 622.7982 (Oct. 2023), pp. 251–254. arXiv: 2310.08360 [astro-ph.EP]
  - Rizzo Smith, M.**, C. S. Kochanek, and J. M. M. Neustadt. “The late time optical evolution of twelve core-collapse supernovae: detection of normal stellar winds”. In: *MNRAS* 523.1 (July 2023), pp. 1474–1495. arXiv: 2212.09763 [astro-ph.HE]
  - A. Kawash, [11 authors], **Rizzo Smith, M.**, T. W. -S. Holoien, J. L. Prieto, and T. A. Thompson. “The Galactic Nova Rate: Estimates from the ASAS-SN and Gaia Surveys”. In: *The Astrophysical Journal* 937.2, 64 (Oct. 2022), p. 64. arXiv: 2206.14132

## Non-Reviewed Articles

(6 first-author, 13 citations)

- M. Rizzo Smith and ASASSN-Team. “An Update on ASASSN-21qj: A Rapidly Fading, Sun-Like Star; Back With a Vengeance”. In: *The Astronomer’s Telegram* 15531 (July 2022), p. 1
- M. Rizzo Smith and ASASSN-Team. “ASASSN-22el: A Deep Eclipse Event”. In: *The Astronomer’s Telegram* 15308 (Apr. 2022), p. 1
- M. Rizzo Smith and ASASSN-Team. “ASASSN-21sa: A Deep Dimming Event”. In: *The Astronomer’s Telegram* 14937 (Sept. 2021), p. 1
- M. Rizzo Smith and ASASSN-Team. “ASASSN-21qj: A Rapidly Fading, Sun-Like Star”. In: *The Astronomer’s Telegram* 14879 (Aug. 2021), p. 1
- M. Rizzo Smith and ASASSN-Team. “ASASSN-21nn: An Unusual Dimming Event in a Red Giant Star”. In: *The Astronomer’s Telegram* 14803 (July 2021), p. 1
- M. Rizzo Smith and ASASSN-Team. “ASASSN-21ml: Discovery of an Extreme ( $\Delta g > 10$  mag) L-Dwarf Flare”. In: *The Astronomer’s Telegram* 14778 (July 2021), p. 1

## OUTREACH

---

<b>Nashville Adventure Science Center, Way Late Play Date</b> , Invited Speaker Public fundraising event dedicated to making science learning accessible for all. “Seeing” Black Holes (50+ attendees)	Apr. 2026
<b>Astronomy on Tap Nashville</b> , Host Facilitate event, run trivia, and answer astronomy related questions from the public. (100+ monthly attendees)	2025 - Present
<b>10-Years of Gravitational Waves, Vanderbilt Community Celebration</b> , Poster “It’s OK to Be Gassy: How Cosmic Gas Guides Black Hole Collisions” (50+ attendees)	Sep. 2025
<b>NASA Advocacy Day</b> , Vanderbilt Federal Relations Met with congressional staffers in Washington D.C. to emphasize funding public science and NASA.	July 2025
<b>NSF GRFP: Navigating the Application Panel</b> , Panelist Panel to prospective applicants (30+ attendees).	Oct. 2025
<b>Vanderbilt Society of Physics Students</b> , Invited Panelist Panel on graduate school application process (15 students).	Oct. 2025
<b>EMIT Outreach</b> , Invited Speaker Career talk on computational astrophysics and higher ed (50+ students).	Jan. 2025
<b>Vanderbilt Society of Physics Students</b> , Invited Panelist Panel on graduate school application process (20+ students).	Oct. 2024
<b>Valor Collegiate Academy</b> , Invited Speaker Career talk to first-year class (150+ students).	Mar. 2024

## TEACHING

---

<b>Graduate Teaching Assistant</b> Course Title: ASTR 1010L: Intro to Astronomy Lab Number of Students: ~21 per term, 4 terms – Rated 5/5 Effective Instructor by 100% of Evaluation Respondents (~ 50% of students taught).	Fall 2023 - Spring 2025
<b>Private Tutor</b> Intro Physics for Medical Professionals	Feb. 2020 - Oct. 2020
<b>Undergraduate Teaching Assistant</b> Course Title: AST 203: Astronomy	Spring 2020