Curriculum Vitae

Personal Information

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Education and Research Experience

08/2025 – Present **NSF MPS ASCEND Postdoctoral Fellow and Weinberg Institute Postdoctoral Fellow**.
Joint appointment between California Institute of Technology and the Univeristy of Texas at Austin. Supervisors: Katerina Chatziioannou and Hsin-yu Chen

09/2019–05/2025 **University of Illinois Urbana-Champaign**
Ph.D., Physics 05/2025
Advisor: Nicolás Yunes

06/2019–05/2025 Graduate Research Assistant, Illinois Relativity Group. Supervisor: Nicolás Yunes.

08/2015–05/2019 **University of Virginia**
B.Sc., Physics
B.A., Mathematics – Graduate Preparatory Concentration
Minor Astronomy

12/2018–06/2019 Undergraduate Research Assistant, University of Virginia Gravity Group. Supervisor: Kent Yagi.

07/2018–08/2018 Undergraduate Research Assistant, took data at Fermi National Laboratory. Supervisor: Edmond C. Dukes.

06/2016–11/2018 Undergraduate Research Assistant, University of Virginia High Energy Physics Group. Supervisor: Edmond C. Dukes.

Fellowships, Scholarships and Grants

I have been awarded $438,450 in total over my academic career.

2025–2027	**NSF MPS ASCEND Postdoctoral Fellowship Recipient**, $300,000 over the life of the award.
2021–2024	**NSF Graduate Research Fellowship Program Recipient**, $105,000 over the life of the award.
2024	DGRAV Student travel award, $300, to travel for a conference presentation.
2023	Physics Graduate Student Travel award, $500, to travel for a conference presentation.
2017–2018	University of Virginia Bascom S. Deaver Scholarship, $5,000.
2017	**Jefferson Trust Recipient**, grant for the construction of a cosmic ray telescope, $26,650.

Honors and Awards

2024	People's choice award, UIUC Physics Research Highlight Science Writing Contest.
2024	**Scott Anderson Outstanding Graduate Assistant Award**; granted by UIUC Physics Department, $500.
2023	Third place in the LIGO's Gravitational Wave Open Data Workshop data challenge out of all workshop participants worldwide.
2022	**Excellence in Outreach, Service, and Diversity Award**; granted by UIUC Physics Department, $500.
2019-2020	Ranked excellent teacher by students, all four semesters leading discussion sections.
2018	Sigma Pi Sigma, National Physics Honor Society.
2017	Intermediate Honors, awarded to the top 20% of students, University of Virginia.
2015–2019	Dean's List for over 3.5 GPA, University of Virginia.
2015–2019	**Echols Scholar**, University of Virginia.

Teaching Experience

Teaching Assistant, Physics Department, University of Illinois Urbana-Champaign.

Fall 2023	PHYS 495/ARTS 499 - The Art of Physics and the Physics of Art
Summer/Fall 2020	Led discussion section. PHYS 213 - Univ Physics: Thermal Physics and PHYS 214 - Univ Physics: Quantum Physics (split semester, both courses)
Spring 2020	Led discussion section. PHYS 102 - College Physics: E&M & Modern
Fall 2019	Led discussion section. PHYS 101 - College Physics: Mech & Heat

Students Mentored

2024–Present	Kaitlyn Prokup – graduate student.
2023–2025	Dhruv Srivastava – undergraduate student.
2023–2025	Ferdinand Ferdinand – undergraduate student.
2023	Emily Dillingham – graduate student.
2021–2023	Rajan Patkar – undergraduate student.
2020–2021	Ashley Shaw – undergraduate student.

Outreach and Public Engagement

2020–Present **Founder and Director of Physics Outreach and Instruction through New Technologies** (POINT) project. This interdisciplinary project aims to generate interest in physics for local middle school and high school students through virtual reality (VR). This involves:

- investigating the benefits of using VR to explain physics in local classrooms (in collaboration with College of Education researchers).
- developing further simulations to explain the fundamental physics of gravity and general relativity (in collaboration with the Computer Science department).
- incorporating existing VR science demonstrations into outreach programs at UIUC (in collaboration with the Physics department and National Center for Supercomputing Applications). *List of past demonstrations:* Central high school, Centennial high school, Urbana high school, Schlarman Academy, Science at the Market, Astronomy summer camp for high school girls (2022 – 2024), WYSE summer camp (2022 – 2024), Midwest Relativity Meeting 2021, ICASU conference 2022, Astrofest (2023 & 2024).

2023–2025 **Letters to a Pre-Scientist Pen-pal.** Participated in a pen-pal program, writing letters to a middle school student from a low-income school who would not otherwise have access to a scientist.

2021–2023 **WYSE summer camp.** Designed lesson content for and ran an educational session in a summer camp for high schoolers interested in engineering.

2022 **Graduate peer mentor.** Served as a mentor to incoming graduate students.

2020–2022 **Physics Facts and Fictions.** Participated in the creation of Youtube videos to dispel common physics misconceptions.

Technical Skills

Programming Languages: Python, C++/C

Auxiliary Software: Mathematica, Latex, git, Docker containers, UIUC sitemanager (web design)

Software Libraries Used: Numpy, GWpy, PyCBC, Matplotlib, GSL, OpenMP

Certifications: Completed Course in the Protection of Human Subjects through the CITI Program. Completed LIGO's Open Data Workshop.

Memberships

2024–Present LISA Consortium, Member.

2023–Present NANOGrav, Associate Member.

2019–Present American Physical Society, Member. This includes membership in both the APS Division of Gravitational Physics and the APS Forum on Outreach and Engaging the Public.

2019–2025 Illinois Center for Advanced Studies of the Universe, Member.

Service

2025 **AstroFest organizing committee.**

2021–2022 **APS Conference for Undergraduate Women in Physics local organizing committee.** Active member in 2021 and again in 2022 after the conference was postponed due to Covid.

Schools and Workshops Attended

NFSG 2024 New Frontiers in Strong Gravity Workshop, July 2024.

GWODW 2023 LIGO's Gravitational Wave Open Data Workshop, May 2023.

AGL 2022 Advancing Graduate Leadership Conference for Women and Gender Minorities in Physics, August 2022.

ET 2021 North American Einstein Toolkit Virtual Summer School, July 2021.

Presentations

Invited Talks

1. Physics outreach and instruction through new technologies (point): Using virtual reality to visualize and teach gravity. In ***IMMERSE Center for Immersive Computing Seminar***, *University of Illinois Urbana-Champaign*, 2025
2. Better early than never: A new test for superluminal gravitational wave polarizations. In ***Theoretical Astrophysics and Relativity Seminar***, *California Institute of Technology*, 2025
3. Better early than never: Testing GR with GW polarizations. In ***Kavli Institute for Cosmological Physics Seminar***, *University of Chicago*, 2024
4. Better early than never: Testing GR with GW polarizations. In ***Astrophysics, Relativity, and Cosmology Seminar***, *University of Illinois Urbana-Champaign*, 2024
5. STEAM Education into the 2030s panel. In *ASEE Annual Conference and Exposition*, June 2023
6. Theoretical physics panel. In *Conference for Undergraduate Women in Physics*, January 2023

Contributed

7. **K. Schumacher**, C. Talbot, D. Holz, and N. Yunes. A new test for additional gravitational wave polarizations. In *Midwest Relativity Meeting*, November 2024
8. **K. Schumacher**, C. Talbot, D. Holz, and N. Yunes. Better Early than Never: Testing GR with GW Polarizations. In *April APS*, April 2024
9. **K. Schumacher**, N. Yunes, and K. Yagi. Better Early than Never: Testing GR with GW Polarizations. In *Midwest Relativity Meeting*, November 2023
10. **K. Schumacher** et al. GR in VR: Using immersive virtual reality as a learning tool for general relativity. In *ASEE Annual Conference and Exposition*, June 2023
11. **K. Schumacher**, S. Perkins, A. Shaw, K. Yagi, and N. Yunes. Converging to the wrong answer:Robustness of theory-specific GW tests of GR. In *April APS*, April 2023
12. **K. Schumacher**, S. Perkins, A. Shaw, K. Yagi, and N. Yunes. Gravitational wave constraints on Einstein-æther theory. In *Midwest Relativity Meeting*, April 2022
13. **K. Schumacher**, S. Perkins, A. Shaw, K. Yagi, and N. Yunes. Constructing a waveform template for Einstein-æther theory. In *April APS*, April 2022
14. **K. Schumacher**, S. Perkins, A. Shaw, K. Yagi, and N. Yunes. Constructing a waveform template for Einstein-æther theory. In *Midwest Relativity Meeting*, November 2021

Public Talks

15. **MiXR (Meetings involving eXtended Reality)**, *Visualizing Polarization Effects of Gravitational Waves Using Particle Rings and Surfaces in Virtual Reality*, 2024.
16. **Astronomy on Tap**, *Space, Time, and Einstein: Gravity in Virtual Reality*, 2024.

17. **Champaign Central High School, Champaign IL**, *An Introduction to Gravity: the science behind the simulation*, 2024.
18. **Champaign Centennial High School, Champaign IL**, *An Introduction to Gravity: the science behind the simulation*, 2023.
19. **WYSE Summer Camp**, *An Introduction to Gravity: the science behind the simulation*, 2023.
20. **Astronomy for high school girls summer camp**, *An Introduction to Gravity: the science behind the simulation*, 2023.
21. **MiXR (Meetings involving eXtended Reality)**, *Physics Outreach and Instruction through New Technologies*, 2023.
22. **Urbana High School, Urbana IL**, *An Introduction to Gravity: the science behind the simulation*, 2022.
23. **Schlarman Academy, Danville IL**, *An Introduction to Gravity: the science behind the simulation*, 2022.
24. **Science at the Market**, Presenting demonstrations for the general public at the Urbana Farmer's Market, 2022.
25. **WYSE Summer Camp**, *An Introduction to Gravity: the science behind the simulation*, 2022.
26. **MiXR (Meetings involving eXtended Reality)**, *Physics Outreach at Illinois through New Technologies*, 2022.
27. **WYSE Summer Camp**, *Gravitational waves*, 2021.

Posters

28. **K. Schumacher**, S. Perkins, A. Shaw, K. Yagi, and N. Yunes. Constructing a waveform template for Einstein æther theory. In *Illinois Center for Advanced Studies of the Universe, Inaugural Conference*, February 2022
29. **K. Schumacher**, S. Joshi, and J. L. Raley. Physics Outreach at Illinois through New Technologies. In *Illinois Center for Advanced Studies of the Universe, Inaugural Conference*, February 2022
30. **K. Schumacher**, R. Ehrlich, and E. C. Dukes. A cosmic ray telescope to measure muon flux at Mu2e. In *Conference for Undergraduate Women in Physics*, January 2018
31. **K. Schumacher**, R. Ehrlich, and E. C. Dukes. Cosmic ray telescope measurements of muon flux at Mu2e. In *APS Southeastern Section*, November 2018