

NITYA RAVI

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Ph.D. Candidate

Department of Physics and Astronomy, University of Rochester

EDUCATION

University of Rochester

Ph.D., Physics and Astronomy

Expected May 2028

M.A., Physics

May 2024

Qualifying Exam

February 2024

University of California, Los Angeles

June 2022

B.S., Applied Mathematics and Astrophysics

RESEARCH EXPERIENCE

University of Rochester Department of Physics and Astronomy

September 2022 - Present

Graduate Research Assistant

Rochester, New York

Advisors: Professor R. Demina & Professor K. A. Douglass

- Model galaxy kinematics and mass distributions of galaxies in the SDSS MaNGA and DESI surveys
- Estimate total and baryonic mass components for galaxies (total mass, stellar mass, neutral hydrogen, molecular hydrogen, metals, and dust) to understand the dark matter content of galaxies
- Statistical analysis of galaxy mass components and observable galaxy properties

UCLA Department of Astronomy

April 2021 - August 2022

Undergraduate Research Assistant

Los Angeles, CA

Advisors: Professor S. Naoz & Dr. S. Torres

- Simulated planet-disk interaction and orbital evolution of comets
- Analytically modeled three body systems to constrain parameters for simulations to produce high velocity ejections and interstellar comets

UCLA Department of Astronomy

October 2020 - June 2021

Undergraduate Research Assistant

Los Angeles, CA

Advisor: Professor S. Furlanetto

- Incorporated the effects of dust into semi-analytic feedback galaxy models in Python
- Fit dust corrected models of star formation and luminosity functions to observational data

NASA Ames Research Center

June - August 2019

Research Intern

Moffett Field, CA

Advisors: Dr. P. Kopardekar, Dr. N. Cramer, & Dr. D. Murakami

- Analytically modeled drone flight for modular drones built from commercial kits and custom parts
- Designed custom drone parts with SolidWorks
- Simulated PID tuning in MATLAB
- Created a function to select modular parts for optimizing a drone

PUBLICATIONS

Ravi, N., Douglass, K. A. & Demina, R. (2025). The Extended Baryonic Tully-Fisher Relation for SDSS MaNGA Galaxies. (Submitted to Apj, arXiv: 2512.18577).

Douglass, K. A., et al. (incl. **Ravi, N.**) The DESI DR1 Peculiar Velocity Survey: The Tully-Fisher Distance Catalog (Submitted to ApJ, arXiv: 2512.03227).

Ravi, N., Douglass, K. A. & Demina, R. (2024). A Full Accounting of the Visible Mass in SDSS MaNGA Disk Galaxies. *ApJ*, 967 (2): 135. (arXiv: 2310.11422)

Ravi, N., et al. (2020, June). Weighted Relative Performance Ranking Function for Optimizing Reconfigurable Drones. AIAA Aviation 2020 Forum. (doi 10.2514/6.2020-3154)

POSTERS

Work presented by supervised students shown in ***bold italics***.

The Extended Baryonic Tully-Fisher Relation

Ravi, N., Douglass, K. & Demina, R.

247th Annual Meeting of the American Astronomical Society (iPoster)

Phoenix Convention Center

January 2026

Phoenix, AZ

The Extended Baryonic Tully-Fisher Relation for SDSS MaNGA Galaxies

Ravi, N., Douglass, K. & Demina, R.

APS Conference for Graduate Women and Gender Minorities in Physics

Grand Hyatt Washington

September 2025

Washington, D.C.

Measuring Rotation Curves of Spiral Galaxies with DESI

JJ Pimentel, Ravi, N., Douglass, K., Demina, R., BenZvi, S.

APS Global Physics Summit 2025 (Poster)

Anaheim Marriott

March 2025

Anaheim, CA

Comparing the Galactic Mass Components for Elliptical and Spiral Galaxies

Ravi, N., Douglass, K. & Demina, R.

245th Annual Meeting of the American Astronomical Society (iPoster)

Gaylord National Resort & Convention Center

January 2025

National Harbor, MD

A Full Accounting of the Baryonic Mass in SDSS MaNGA Disk Galaxies

Ravi, N., Douglass, K. & Demina, R.

243rd Annual Meeting of the American Astronomical Society (iPoster)

New Orleans Convention Center

January 2024

New Orleans, LO

Using Machine Learning to Detect Large Galaxies

Moore, S., et al. (incl. **Ravi, N.**)

243rd Annual Meeting of the American Astronomical Society (iPoster)

New Orleans Convention Center

January 2024

New Orleans, LO

Broad-Use Reconfigurable Drones: Vehicle Level Design

Ravi, N., et al.

NASA Ames Research Center Summer Internship Research Symposium (Poster)

August 2019

Moffet Field, CA

TALKS

CONFERENCES

The Art of Presenting (**Invited Talk**)

APS Conference for Undergraduate Women and Gender Minorities in Physics

Denver

March 2026

Denver, CO

The Extended Baryonic Tully-Fisher Relation of SDSS MaNGA Galaxies

28th International Conference on Cosmology and Particle Physics

Carnegie Mellon University

October 2025

Pittsburgh, PA

The Baryonic Tully-Fisher Relation of Galaxies in the DESI Peculiar Velocity Survey

DESI Summer 2025 Collaboration Meeting

Virtual Participant

July 2025

Measuring Mass Components of Galaxies in the DESI Peculiar Velocity Survey
DESI Winter 2023 Collaboration Meeting
Virtual Participant

December 2023

Weighted Relative Performance Ranking Function for Optimizing Reconfigurable Drones
American Institute of Aeronautics & Astronautics Aviation 2020 Forum
Virtual Event

June 2020

RESEARCH SYMPOSIA

A Full Accounting of the Visible Mass in SDSS MaNGA Disk Galaxies
University of Rochester PAS Graduate Student Research Meeting

February 2024
Rochester, NY

Measuring Dark Matter in Spiral Galaxies

October 2023

Winner of Graduate Research Day Award

University of Rochester Graduate Research Day

Rochester, NY

Runaway Comets: Hypervelocity Ejections from Planetary Systems
UCLA Summer REU Research Symposium

August 2021
Los Angeles, CA

OUTREACH

Some galaxies spin weird!
Astronomy on Tap Rochester

16 September 2025
Rochester, NY

Galaxies & Dark Matter
Rochester Museum and Science Center: Space Week

14 April 2025
Rochester, NY

Observing Dark Matter
Astronomy Section Rochester Academy of Science

6 September 2024
Ionia, NY

INTERNAL TALKS

A Review of the Stellar Initial Mass Function
University of Rochester Astronomy Journal Club

30 October 2025
Rochester, NY

The Baryonic Tully-Fisher Relation Or:
How I Learned To Stop Worrying And Love MOND
University of Rochester Astronomy Journal Club

7 November 2024
Rochester, NY

Detecting Starless Dark Matter Halos
University of Rochester Astronomy Journal Club

2 November 2023
Rochester, NY

FELLOWSHIPS & AWARDS

Donald M. and Janet C. Barnard Fellowship

2025-2026

NSF Graduate Research Fellowship Program Honorable Mention

April 2024

Graduate Research Day Award

October 2023

Received for talk presented at the University of Rochester Graduate Research Day

Graduate Teaching Award

May 2023

Annual prize awarded by the University of Rochester Department of Physics and Astronomy for the most outstanding graduate teaching assistant

UCLA Dean's Honors List

Spring 2019, Fall 2019, Winter 2020, Fall 2020, Spring 2021, Fall 2021, Winter 2022, Spring 2022

TEACHING & SERVICE

SUBSTITUTE LECTURER

Astronomy 554: Cosmology (Graduate Course)	2 lectures, Fall 2025
Professor: Regina Demina (University of Rochester)	2 lectures, Spring 2025
Wrote and presented lectures on galaxies, rotation curves, and evidence for dark matter	
Physics 407: Quantum Mechanics I (Graduate Course)	1 lecture, Fall 2024
Professor: Gabriel T. Landi (University of Rochester)	
Physics 142: Electricity & Magnetism Honors	2 lectures, Fall 2023
Professor: Segev BenZvi (University of Rochester)	

TEACHING ASSISTANT

Physics 114: General Physics II	Spring 2026
Astronomy 142: Elementary Astrophysics Honors	1 workshop, Spring 2025
Substitute TA	
Physics 407: Quantum Mechanics I (Graduate Course)	Fall 2024
Physics 237: Quantum Mechanics of Physical Systems	Spring 2023
Physics 142: Electricity & Magnetism Honors	Fall 2022

CURRICULUM DEVELOPMENT & INSTRUCTION

Physics 407: Quantum Mechanics I (Graduate Course)	Spring 2024
- Provided critique on course structure, content, and rigor for major course redesign.	
Computational Research Access Network	
<i>Curriculum Development</i>	August 2023 - February 2024
- Co-developed lessons for python based computational research skills workshops aimed at undergraduate students at non-research institutions	
UCLA Olga Radko Endowed Math Circle	UCLA
<i>Curriculum Development, Instructor</i>	October 2018 - June 2021
- Co-developed lessons in game theory, set theory, and induction for 5th and 6th grade classes	
- Developed a combinatorics math lesson based on the game Futoshiki for 5th and 6th grade classes	
- Taught a weekly two hour advanced math class for twenty-five 5th and 6th grade students	

OUTREACH

C.E.K. Mees Observatory	Naples, NY
<i>Tour Guide</i>	June 2024 - Present
- Lead public tours of University of Rochester's C.E.K. Mees Observatory	
- Organize observing programs for tours	
- Give presentations on the history of the Mees Observatory and general astronomy topics	
Testing Gravity and Dark Matter on Small Scales with the Baryonic Tully-Fisher Relation	
Astronomy Section, Rochester Academy of Science Newsletter (2025, October). <i>Invited article.</i>	
Physics & Astronomy Graduate Student Association	University of Rochester
<i>Humanities in STEM Day Teaching Assistant</i>	July 2024
<i>Eclipse Festival Volunteer</i>	April 2024
- Co-developed and taught lessons on Big Bang Nucleosynthesis and symmetry in physics aimed at elementary school students for Humanities in STEM day	
- Led physics demonstrations for the Eclipse Festival at the Rochester Museum & Science Center	

DEPARTMENT SERVICE

Workplace Environment Committee	2023 - Present
Rochester Symposium for Physics Students 2026 Programming	November 2025
Graduate student orientation programming	August 2025
Graduate and REU program information booth, CU*iP career fair (<i>Syracuse University</i>)	January 2025

Graduate student orientation programming	August 2024
Moderation of Experienced Graduate TA and Graduate Life panels	August 2024
Admitted students weekend programming	Spring 2023, Spring 2024
Astronomy faculty hiring search	Spring 2022, Spring 2023

DESI COLLABORATION

Remote observing shifts	2023 - Present
Observing shift	February 2025

INVITED PANELIST

Choosing a Research Group, <i>PAS Department</i>	November 2023
Applying to Grad School, <i>Society of Women in Astronomys and Physics</i>	October 2023
Graduate TA Training, <i>University of Rochester PAS Department</i>	August 2023
Queer and Trans in STEM for High School Students, <i>UCLA qSTEM</i>	November 2021

PROFESSIONAL MEMBERSHIP

American Astronomical Society	2023 - Present
American Physical Society	2024 - Present

CONFERENCES & WORKSHOPS

Michigan Cosmology Summer School, <i>University of Michigan</i>	June 2025
DESI Winter 2024 Collaboration Meeting (Virtual Attendee)	December 2024
Boundless Together Annual Conference, <i>University of Rochester</i>	October 2024
DESI Summer 2024 Collaboration Meeting (Virtual Attendee)	July 2024
APS Conference for Undergraduate Women in Physics (Virtual Attendee)	January 2022
APS Conference for Undergraduate Women in Physics (Virtual)	January 2021
APS Conference for Undergraduate Women in Physics, <i>UC Irvine</i>	January 2020

UCLA

Undergraduate Science Journal	UCLA
<i>Editorial Board Member</i>	September 2021 - June 2022
<ul style="list-style-type: none"> - Reviewed and selected papers to be published in the journal - Participated in weekly discussions and workshops regarding science communication and science literacy - Lead editor for physics article in UCLA Undergraduate Science Journal Volume 35 	

LEADERSHIP & MENTORSHIP

STUDENTS

Research

Emilio Benitez Aguinaga
JJ Pimentel

REU 2025
REU 2024

Academic Mentorship

Andrew Milne
Amanda Elliott
Lavanya Pandey

2025-Present
2023-2024
2020-2022

APS CU*iP Program Committee

Committee member

- Develop programming for the 2026 Conference for Undergraduate Women and Gender Minorities in Physics
- Review conference applications and select admitted students
- Introduce speakers and moderate discussion during conference

American Physical Society
October 2025 - Present

Physics & Astronomy Graduate Student Association

Secretary

- Organize meetings, elections, and disseminate the board's communications to physics graduate students

University of Rochester
July 2025 - Present

President July 2024 - June 2025

- Advocated for graduate student needs to faculty and administration within the Physics & Astronomy department
- Formalized graduate student involvement in faculty hiring process
- Advocated for consistent nomination of PAS graduate students for university-wide fellowships
- Organized Graduate Student Research Meeting, a PAS graduate student research symposium, and first-year barbecue, event to help assimilate first-year graduate students into the department

Graduate Student Peer Mentor August 2023 - August 2024

- Mentored a first-year graduate student to help with adjusting to graduate school

Treasurer July 2023 - July 2024

- Tracked and managed the association's finances

Vice President of Fellowship January 2023 - July 2024

- Organized monthly student events to promote camaraderie among graduate students

APS CU*iP Local Organizing Committee University of Rochester
Committee Chair October 2023 - March 2025

- Led a committee of 24 faculty, graduate students, technical staff, and administrative staff in writing a proposal to host the Conference for Undergraduate Women and Gender Minorities in Physics (CU*iP)
- Contacted the chairs of PAS, Optics, Mechanical Engineering, Deans of SAS and Engineering, and external private companies to secure sponsorship pledges totaling \$45,000
- Selected by APS to host CU*iP 2026

Department of Physics & Astronomy University of Rochester
Peer Mentor Leader August 2024 - June 2025

- Support first-year graduate students through weekly office hours and one-on-one meetings once a semester
- Review students' individual course progress, teaching, and emotional well being in order to assess the overall success of the cohort
- Liaise between first-year graduate students and faculty to provide feedback on courses, teaching resources, and department communications
- Maintain lab records and improve lab documentation for introductory physics courses

Marginalized Identities in Physics and Astronomy UCLA
Undergraduate Mentor October 2020 - June 2022

- Mentored lower division Physics and Astronomy undergraduates to help them with issues in academics, clubs, finding research advisors, and navigating the physics field as a marginalized student

Athena Robotics San Jose, CA
Programming Mentor June 2018 - May 2019

- Assisted an all-girls high school robotics team with developing strategy for FIRST Tech Challenge competition
- Taught Java for robotics and Git to robotics team