

+1-(816)-752-4570
anshrg@utexas.edu
GitHub: anshrg
Website: anshrg.com

Ansh R. Gupta

Department of Astronomy
The University of Texas at Austin
2515 Speedway, Austin,
Texas 78712

NSF Graduate Research Fellow

Department of Astronomy, The University of Texas at Austin

RESEARCH INTERESTS

I am interested in searching for the most distant galaxies and black holes in the universe. I would like to study how these objects evolve, both independently and together, and investigate their impacts on a large scale. I'm also interested in the potential of machine learning to revolutionize this work.

EDUCATION

Ph.D. in Astronomy

The University of Texas at Austin

August 2024 - Present

Advisor: Steven Finkelstein

Bachelor of Science in Astronomy and Physics

The University of Arizona

August 2020 - May 2024

GPA: 4.0/4.0

Relevant Coursework: Extragalactic Astronomy and Cosmology, Structure and Dynamics of Galaxies, Astronomical Instrumentation, Astronomy and Astrophysics (galaxies/cosmology), Astronomy and Astrophysics (stars), Theoretical Astrophysics, Observational Astronomy, Writing Across the Space Sciences, Quantum Theory II, Electricity and Magnetism II, Computational Physics, Thermal Physics, Optics
(*Hyperlinks to Github repositories containing computational final projects and assignments*)

AWARDS & HONORS

National Science Foundation Graduate Research Fellowship	2024-2029
Outstanding Senior - University of Arizona College of Science	2024
<i>Winner selected from College of Science departmental Outstanding Seniors (<i>commencement speech</i>)</i>	
Outstanding Senior - Steward Observatory	2024
<i>Selected from all graduating seniors in astronomy at the University of Arizona</i>	
Chambliss Astronomy Achievement Award - Honorable Mention	2024
<i>Awarded for poster presentation at the 243rd meeting of the American Astronomical Society</i>	
Lea Booher Memorial Scholarship	2023-2024
<i>Awarded for proven scholastic ability and research excellence</i>	
Angelos C. Langadas Fund in Astronomy Scholarship	2023-2024
<i>Awarded for strong commitment to pursuing a career in Astronomy and academic achievement</i>	
Weaver Award for Undergraduate Research	2023-2024
<i>Awarded for promise as a future research scholar based on demonstrated achievement</i>	
Dean's List With Distinction	2020-2024
National Merit Finalist Tuition Scholarship	2020-2024

PUBLICATIONS

Yang, J., Fan, X., **Gupta, A.**, et al, 2023, ApJS, DESI $z > \sim 5$ Quasar Survey. I. A First Sample of 400 New Quasars at $z \sim 4.7 - 6.6$.

Gupta, A., Kirkpatrick, A. et al, 2024, in prep., Emission-Line Ratios and Ionization Conditions of CEERS EGS Galaxies with JWST/NIRSpec. (Read-only Overleaf draft, to be submitted to the *Research Notes of the American Astronomical Society* by end of 2024)

PRESENTATIONS

The Night Sky at Splendido

February 2024

- Outreach talk at Splendido Retirement Community in Tucson, AZ ([recording](#))

Emission-Line Ratios and Ionization Conditions of CEERS EGS

January 2024

Galaxies with JWST/NIRSpec

- Poster presented at the 243rd Meeting of the American Astronomical Society ([iPoster](#))
- Gave oral presentation at University of Kansas Undergraduate Research Symposium ([recording](#))

The Night Sky at Rolling Hills

July 2023

- Invited outreach presentation at the Rolling Hills Library in Saint Joseph, MO ([recording](#))

Using Machine Learning to Detect Science Misinformation

January 2023

- Contributed to poster at the 241st Meeting of the American Astronomical Society ([iPoster](#))

Invited and Contributed Public Outreach Presentations

2016 - Present

- 30+ presentations at public outreach events, schools, astronomy clubs, etc. ([list](#))

RESEARCH EXPERIENCE

DESI High Redshift Quasar Survey

August 2021 - Present

Advisors: Prof. Xiaohui Fan, Prof. Jinyi Yang

Steward Observatory, The University of Arizona

- Constructed high-redshift quasar sample using Dark Energy Spectroscopic Instrument (DESI) data
- Confirmed >1000 candidates from the DESI Legacy Imaging Surveys
- Identified emission line and absorption features using spectral analysis tools
- Currently working on determination of quasar luminosity function and two point correlation function
- Simulating observations of mock spectra to compare with observations
- Using statistical tools to compare currently observed sample with simulations
- Coauthored publication, expect to produce first-author publication by end of 2024

Ionization Conditions of JWST/NIRSpec CEERS Galaxies

May 2023 - August 2023

Advisor: Prof. Allison Kirkpatrick

Department of Physics & Astronomy, The University of Kansas

- Research Experience for Undergraduates (REU) at the University of Kansas
- Investigated ionization conditions in JWST CEERS galaxies at redshift $\sim 2 - 8$
- Created optical line ratio diagrams from NIRSpec data
- Correlated positions on diagrams with redshift, stellar mass, and star formation rate
- Compared galaxy specific star formation rates to main sequence of star forming galaxies
- Determined AGN properties including bolometric luminosity and accretion rate from optical line fluxes
- Preparing research note for submission to the *Research Notes of the American Astronomical Society*

Machine Learning Tools to Combat Fake Science

August 2021 - May 2023

Advisor: Prof. Christopher Impey

Steward Observatory, The University of Arizona

- Tagged real/fake science articles and selected open source datasets for analysis using large language models
- Created educational astronomy YouTube videos for [Active Galactic](#) with > 50,000 total views ([playlist](#))
- Wrote questions for and edited astronomy-focused Massive Open Online Course with > 3,000 enrollments
- Coursera course name - Knowing the Universe: History and Philosophy of Astronomy ([course link](#))

LEADERSHIP

Deep Learning for Astrophysics Hackathon Series

Spring 2024

Organizer

- Organize and run program from the UA Theoretical Astrophysics Program Computation and Data Initiative
- Part of leadership team making and presenting materials for the machine learning hackathon series
- Produce presentations to teach attendees about theoretical and practical application of deep learning
- Create google colab notebooks for participants to read, modify, and write code
- Run hands-on sessions by providing guidance, answering questions, giving feedback to participants
- End goal to provide machine learning training and hands-on experience to attendees
- Will be used in proposal for NSF-Simons grant to establish national AI-astrophysics research institute

[Link to hackathon homepage with summary of activities](#)

American Astronomical Society Congressional Visit

April 2024

Advocate

- Selected for AAS sponsored program to support astronomical science at the congressional level
- Will meet with representatives to convey the importance of astronomical decadal surveys priorities
- Advocate for increased federal support and funding for space sciences
- Learn about ongoing work from NASA, the NSF, and Department of Energy

Citizens' Climate Lobby

2020 - Present

Northwest Missouri Chapter Leader

- Lobbying for bipartisan legislative action on climate change
- Meet with representatives' and senators' legislative teams to push for improved climate policy
- Direct grassroots climate change action efforts including securing endorsements from local businesses
- Help members send messages to representatives and write letters to the editor in local newspapers
- Organize outreach and educational events about the impacts of climate change and effective policy

Saint Joseph Astronomy Club

2016 - Present

Founder and President

- Founded astronomy club in hometown to promote science outreach with ~ 50 active members
- Gave monthly educational public lectures on popular astronomy topics and current events
- Invited to give presentations for 2017 total solar eclipse at East Hills Library with ~ 100 attendees each
- Currently run online newsletter about developments in space and new astronomy research

TIMESTEP

2023 - 2024

Tucson Initiative for Minoritized Student Engagement in Science & Technology Program

- Selected as undergraduate student leader
- Help lead professional development and career advice program for astronomy and physics undergraduates
- Participate in student-led panels to discuss navigating the astronomy and physics majors
- Serve as peer mentor for students and advise how to find undergraduate research experiences

University of Arizona Astronomy Club

2021 - 2024

Presenter

- Regularly give presentations on astronomical news, my individual research, and broader topics in science
- Have participated in > 15 monthly outreach events throughout the greater Tucson area
- Operate telescopes at public showings and run demonstrations at nearby elementary and middle schools
- Interviewed for department public engagement videos/media

PROFESSIONAL DEVELOPMENT

Astromatic 2023

August 2023

Astrophysics Machine Learning/AI Program

Ciela Institute, Université de Montréal

- Trained score-based generative model for denoising and deblurring of HST PROBES dataset images
- Used score-based neural network to generate simulated HST-like noise
- Successfully constructed posterior samples of galaxy images from images with added noise
- Worked with a team to produce and analyze results
- Prepared and delivered an oral presentation, awarded 2nd place team by hackathon judges

SKILLS

Programming

Python, Git, L^AT_EX, Jupyter, SQL, Linux

Other

Microsoft Office, Adobe Creative Suite