Anavi Uppal

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Education

University of California, Santa Cruz — Santa Cruz, CA
Ph.D. in Astronomy & Astrophysics — *September 2024 —*

Yale University — New Haven, CT
B.S. in Astrophysics (cum laude), Certificate in Programming; GPA: 3.91 — *August 2020 – May 2024*

Publications

- **Uppal A. et al.** submitted to ApJ. *"Luminous quasar offset 10 kpc from its host galaxy at z=0.224: A candidate recoil or slingshot supermassive black hole."*

Research Experience

Undergraduate Researcher: Barred Galaxies — May 2023 – August 2023
Magnier Group — *Mānoa, HI*

- Selected as a summer NSF-REU intern at the University of Hawai'i Institute for Astronomy, supervised by Dr. Hua Gao and Prof. Eugene Magnier
- Calculated $z \sim 0$ barred galaxy fractions and barred galaxy detectability in the TNG50 run of the IllustrisTNG simulation compared to real HSC-SSP imaging

Undergraduate Researcher: Recoiling AGNs — June 2022 – Present
Gezari Group — *Nantucket, MA*

- Selected as a summer NSF-REU intern at the Maria Mitchell Observatory, and continuing work as my undergraduate thesis, supervised by Dr. Suvi Gezari and Prof. Priyamvada Natarajan
- Created a method to identify recoiling active galactic nucleus (AGN) candidates in optical imaging survey data
- Identified five new recoiling/slingshot AGN candidates in Pan-STARRS data

Meteor Prediction — January 2023 – May 2023
Independent Project — *New Haven, CT*

- Created a tool called Meteoreo that predicts the number of meteors visible per hour based on location, date, time, moon phase, and local light pollution. Takes into account both meteor showers and sporadic meteors.
- Website and GitHub repository

Undergraduate Researcher: Binary Black Hole Star Systems — June 2021 – May 2022
Bailyn Group — *New Haven, CT*

- Calculated an upper limit on the post-outburst period of the binary black hole star system GRO J1655-40 by reducing and analyzing 20 years of optical and infrared imaging, supervised by Prof. Charles Bailyn
- Coded a pipeline to reduce infrared data from the Small and Moderate Aperture Research Telescope System (SMARTS)

Awards and Fellowships

- **National Science Foundation Graduate Research Fellowship** (2024 – 2029)
- **George Beckwith Prize** (Yale University, 2024)
- **Yale Science and Engineering Association Award for Outstanding Undergraduate Achievement** (2024)
- **National Association of Science Writers (NASW) Perlman Mentoring Program Summer Writing Award** (2023)
- **Chambliss Astronomy Achievement Student Award** (241st American Astronomical Society Meeting, January 2023)
- **Best Poster Award** (Brown University Conference for Undergraduate Women in Physics, January 2023)
- **Yale First-Year Summer Research Fellowship in the Sciences & Engineering** ($4300, April 2021)

Talks

- **Yale University (September 2023)**: Local Barred Galaxies in Simulations and Observations
- **University of Hawai'i (July 2023)**: Barred Galaxies in the TNG50 Simulation and HSC-SSP at $z \sim 0$
- **Brown University Conference for Undergraduate Women in Physics (January 2023)**: Searching for Recoiling Black Hole Candidates
- **Yale University (September 2022)**: Searching for Recoiling AGN Candidates
- **Maria Mitchell Association (August 2022)**: Searching for Recoiling Black Holes
- **Sand Lake Elementary School (October 2021)**: Exoplanets!
- **Yale University (August 2021)**: The Evolution of the Orbital Period in the X-Ray Black Hole Binary System GRO J1655-40

Poster Presentations

- **243rd American Astronomical Society Meeting (January 2023)**: Galactic Bars in TNG50 and HSC-SSP in the Local Universe
- **Conference for Undergraduate Women in Physics (January 2024)**: Local Barred Galaxies in Simulations and Observations
- **241st American Astronomical Society Meeting (January 2023)**: Using Astrometric Jitter to Find Recoiling AGN Candidates in Optical Imaging Survey Data
- **Brown University Conference for Undergraduate Women in Physics (January 2023)**: Using Astrometric Jitter to Find Recoiling AGN Candidates in Optical Imaging Survey Data
- **Conference for Undergraduate Women in Physics (January 2022)**: The Evolution of the Orbital Period in the Binary Black Hole Star System GRO J1655-40

Observing Experience

- **Keck I Telescope, Co-I**: 1 night. PI: Charlotte Ward. Instrument: LRIS

Teaching Experience

ASTR 310 Tutor Nov 2023 – Dec 2023
Yale Poorvu Center for Teaching and Learning *New Haven, CT*

- Taught major-level galactic and extragalactic astronomy in one-on-one tutoring sessions.

ASTR 120 Tutor Feb 2023 – May 2023
Yale Poorvu Center for Teaching and Learning *New Haven, CT*

- Taught an introduction to galactic and extragalactic astronomy, including supermassive black holes, cosmology, and the structure and evolution of galaxies. Tutored in one-on-one and group sessions.

Science Communication and Outreach

Senior Staff Writer October 2020 – May 2024
Yale Scientific Magazine *New Haven, CT*

- Wrote articles about recent scientific discoveries in a way that was exciting and easily understandable to the public
- In 2023: Served as the Features Editor. Pitched feature article topics, guided writers through the writing process, and edited articles.
- In 2022: Served as the Social Media Head. Managed the magazine's science outreach efforts on Instagram, Twitter, and Facebook.
- In 2021: Served as an Outreach Coordinator for Synapse, the magazine's outreach branch

Community Liaison August 2022 – May 2023
Women in Physics *New Haven, CT*

- Planned events to create community among women and gender minorities who are involved in physics at Yale

Astronomy Public Night Guide June 2022 – August 2022
Maria Mitchell Observatory *Nantucket, MA*

- Assisted with public nights twice a week as part of the Maria Mitchell NSF-REU internship

- Gave constellation tours to crowds of 70+ visitors
- Showed the public the night sky through observatory telescopes
- Answered questions and did trivia for children and adults

Social Media Intern August 2021 – December 2021
NASA Ames Research Center *Remote*
- Proposed and created posts showcasing Ames science and engineering content and engaged our global audience with NASA material
- Communicated complex science topics concisely and accurately on Instagram, Twitter, and Facebook

Yale Demos Instructor October 2020 – December 2021
Yale Demos *Remote*
- Taught science to New Haven 3rd graders at Worthington Hooker School (2021) and King-Robinson School (2020) for one hour weekly during the school year

Popular Science Writing

- **Solar Eclipse Experiment Will Fly a Kite to Avoid Cloudy Skies** (Scientific American, March 2024)
- **The Golden Standard: Using Gold Nanoparticles to Reveal the Age of Whiskey** (Yale Scientific Magazine, May 2023)
- **A Real-Life Infinity Stone: The Time Crystal** (Yale Scientific Magazine; September 2022)
- **The Fault in Our Stars: Light Pollution and the Rise of Satellite Megaconstellations** (Yale Scientific Magazine; February 2022; co-authored)
- **Decrypting Dinosaurs of the East: Uncovering Records of Eastern North American Tyrannosaurs** (Yale Scientific Magazine; November 2021; co-authored)
- **Up in Flames: Retrieving Clues About Air Pollution From Forest Fires** (Yale Scientific Magazine; April 2021)
- **Comet Catalina: Delivering the Ingredients of Life** (Yale Scientific Magazine; June 2021)
- **Planetary Protection: How the Ancient Moon Shielded Earth's Atmosphere** (Yale Scientific Magazine; March 2021)

Popular Science Radio

- **The Star Report with Anavi: The Size of Our Solar System** (The Nature of Nantucket; August 2022)
- **The Star Report with Anavi: The Five Planet Alignment** (The Nature of Nantucket; June 2022)
- **The Star Report with Anavi: The Summer Solstice** (The Nature of Nantucket; June 2022)

Other Interests

- **Archery**: 2023 Yale Club Archery President. 2022 Yale Club Archery Head Captain. USA Archery Level 2 certified instructor. 8 total years of experience.
- **Photography and Astrophotography**: Photos have been featured by NASA Ames Research Center and WBUR News. 7 years of experience.

Additional Information

Memberships: American Astronomical Society (2022 – present), Society of Physics Students (2021 – present), National Association of Science Writers (2023 – present)
Programming Languages: Python, C/C++, Unix, Racket
Research Software: PypeIt, Image Reduction and Analysis Facility (IRAF), SAOImageDS9, AutoProf
Languages: Hindi (proficient)