

# Aadya Agrawal

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## Education

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### University of Illinois at Urbana-Champaign

Urbana-Champaign, IL

#### DOCTOR OF PHILOSOPHY IN ASTRONOMY

Aug. 2023 - Present

- Research Advisor: Gautham Narayan
- GPA: 3.8/4.0
- Ph.D. Candidate (as of Sep 29, 2025)

### University of Michigan

Ann Arbor, MI

#### BACHELOR IN SCIENCE

Sep. 2019 - May 2023

- High Honors in Physics and Astronomy
- Physics Honors Thesis Advisor: Dr. Hui Deng
- Cumulative GPA: 3.64/4.00

## Research Experience

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### University of Illinois at Urbana-Champaign

Urbana-Champaign, IL

#### ADVISOR: DR. GAUTHAM NARAYAN

Aug. 2023 - Present

- Conducting difference imaging and measuring updated time-delay measurements for SN H0pe.
- Testing the lens models of strongly lensed SN H0pe using JWST NIRC2 data. Submitted to ApJ.
- Modelled strongly-lensed Type Ia supernovae using **BAYESN** and **SALT3**.
- Conducting cosmological analysis combining ground-based data with HST for Supernovae in the InFRared Avec Hubble project
- Mentoring 2 undergraduate students.

### University of Michigan - Dept of Astronomy

Ann Arbor, MI

#### ADVISOR: DR. JOEL BREGMAN

May 2022 - May 2023

- Matched sources from the eRosita Final Equatorial Depth survey (eFEDS) to the MCXC and Planck catalogs to determine which sources are new.
- Created master catalog combining data from eFEDs, Planck and MCXC catalogs.
- Creating a source detection algorithm to find strong SZ peaks in the publicly available Planck maps and match them to sources in the master catalog. This algorithm will be run over the whole sky to help with the detection of new low mass galaxy groups and clusters.
- Calibrating the algorithm using the eFEDs field to ensure accuracy and completeness.

### University of Michigan - Undergraduate Research Opportunities Program (UROP)

Ann Arbor, MI

#### ADVISOR: DR. HUI DENG

Sept. 2019 - May. 2023

- Designed and developed a new microscope transfer stage with two XYZ stages, a rotating stage, a heating element and a microscope with camera to facilitate the fabrication of 2D heterostructures using the PC film mechanical transfer method.
- Prepared 2D heterostructures and transferred them onto a 1D photonic nanocavity using the mechanical transfer method.
- Analyzed the integrated structure using an laser and spectrometer to investigate the properties of the exciton
- Honor's Thesis: "Integration of Van der Waals heterostructures of Transition Metal Dichalcogenides with 1D photonic crystal nanobeams."

## Teaching Experience

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Spring 2023	<b>Astronomy 405 - Planetary Science</b> , Teaching Assistant	UIUC, IL
Fall 2023	<b>Astronomy 406 - Galaxies and the Universe</b> , Teaching Assistant	UIUC, IL

## Technical Skills

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**Python:** Proficient in the use of packages like numpy, pandas, matplotlib, seaborn, astropy and scipy for statistical analysis, numerical integration, model fitting, creating algorithms and effectively visualizing results and data products.  
*Astronomy Specific Programs:* BAYESN, SALT, SNCOSMO & HEALPY.

**Data Reduction and Analysis:** Proficient in data reduction, analysis, difference imaging, photometry for space-based data.  
*Ex:* JWST Science Calibration pipeline, SPACEHOT, WebbPSF, HOTPANTS, PyZOGY.

**LaTeX:** Exceptionally fluent. Can easily construct many different reports and documents.

## Awards

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- 2023 **Chambliss Astronomy Award**, American Astronomical Society  
2025 **Graduate Student Fellowship**, Center for Astrophysical Surveys & The NFS-Simons Institute for the Sky (SkAI)

## Publications

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- Pierel, Justin et. al (incl. Agrawal, Aadya) , Sept 2025, *Cosmology with supernova Encore in the strong lensing cluster MACS J0138–2155: Time delays & Hubble constant measurement*. The Astrophysical Journal, Volume 998, Issue 2, id.219, 17 pp.
- Coulter, David et. al (incl. Agrawal, Aadya), Jan 2026, *A spectroscopically confirmed, strongly lensed, metal-poor Type II supernova at  $z = 5.13$* . eprint arXiv:2601.04156. Submitted to Science.
- Grayling, M et. al (incl. Agrawal, Aadya) , Oct 2025 *BayeSN-TD: Time Delay and  $H_0$  Estimation for Lensed SN H0pe*. eprint arXiv:2510.11719. Submitted to MNRAS
- Agrawal, Aadya** et. al, Oct 2025 *Testing Lens Models of PLCK G165.7+67.0 Using Lensed SN H0pe*. eprint arXiv:2510.07637. Submitted to ApJ.
- Pierel, Justin et. al (incl. Agrawal, Aadya) , March 2025. *Testing for Intrinsic Type Ia Supernova Luminosity Evolution at  $z > 2$  with JWST* The Astrophysical Journal Letters, Volume 981, Issue 1, id.L9, 10 pp.
- Larison, Conor et. al (incl. Agrawal, Aadya) , February 2025. *LensWatch. II. Improved Photometry and Time-delay Constraints on the Strongly Lensed Type Ia Supernova 2022qmx (“SN Zwicky”) with Hubble Space Telescope Template Observations* The Astrophysical Journal, Volume 980, Issue 2, id.172, 13 pp.
- Pierel, Justin (incl. Agrawal, Aadya) , June 2024. *Lensed Type Ia Supernova “Encore” at  $z=2$ : The First Instance of Two Multiply-Imaged Supernovae in the Same Host Galaxy* The Astrophysical Journal Letters, Volume 967, Issue 2, id.L37, 9 pp.
- Agrawal, Aadya** , 2024. *Integration of Van der Waals heterostructures of Transition Metal Dichalcogenides with 1D photonic crystal nanobeams*. Physics Honors Thesis

## Presentations and Posters

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- January 2026. *Probing the Hubble Constant with JWST: Updated Time-Delay Measurements from the Triply-Imaged Type Ia Supernova SN H0pe*. Presentation: Extragalactic Time Domain Science with JWST Special Session, 247th Meeting of the American Astronomical Society, Phoenix, AZ.
- January 2026. *Testing Lens Models of PLCK G165.7+67.0 Using Lensed SN H0pe*. Presentation: 247th Meeting of the American Astronomical Society, Phoenix, AZ.
- June 2025. *Testing Lens Models using SN H0pe*. Poster: Cosmic Lighthouses: Astrophysical and Cosmological Challenges with Type Ia Supernovae Meeting, KICC, Cambridge, UK.
- April 2025. *Testing Lens Models using SN H0pe*. Poster: Astrofest 2025, Urbana-Champaign, IL.
- March 2025 *Testing Lens Models with Triply-Lensed SN H0pe*. Presentation: Transients from Space Workshop 2025, STSci, Baltimore, MD.
- July 2024 *Testing Lens Models using SN H0pe*. Poster: Dark Energy Science Collaboration Meeting, Zurich, Switzerland.
- January 2023. *Improving the Detection of Low-Mass Galaxy Clusters and Groups using the Sunyaev-Zeldovich Effect*. Poster: 241st Meeting of the American Astronomical Society, Seattle, WA. Awarded the **CHAMBLISS ASTRONOMY AWARD IN THE UNDERGRADUATE CATEGORY**.
- April 2019. *Developing new equipment and method to create 2D heterostructures using the mechanical transfer process*. Presentation: Undergraduate Research Opportunities Program Symposium, Ann Arbor, MI.

## Mentoring

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- Jan 2025- **Ruixing (Ray) Liang**, Undergraduate Researcher, *Testing and validation of Photo-z methods for LSST* UIUC  
Present
- Jan 2025- **Tanmay Raswant**, Undergraduate Researcher, *Cosmological analysis of ground-based data for SIRAH* UIUC  
Present

## Professional Experience

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Aug 2025 **JWST Summer School: High Redshift Transients**, Space Telescope Science Institute

*Baltimore, MD*

## Outreach Activities

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### **Astronomy on Tap, Urbana-Champaign**

*Urbana, IL*

#### ORGANIZER

*Jan. 2025 - Present*

- Organized monthly public talks at a local bar coordinating with local and visiting speakers.
- Create social media posts and manage profile to build engagement.

### **Girls Astronomy Summer Camp 2024**

*Urbana, IL*

#### COUNSELOR

*Jul. 2024*

- Created Jupyter notebooks to teach students the basics of coding with Python, placing emphasis on packages commonly used in astronomy.
- Led activities and coding sessions using the CAPS Jupyter Hub with other counselors to build astronomy knowledge, scientific analysis and coding skills to provide high school students with early experience in the field.

### **Eclipse at the Park**

*Marion, IL*

#### VOLUNTEER

*Apr. 2024*

- Conducted solar observing for 6 hours on the day of the total solar eclipse at the Marion Baseball Stadium for around 1500 people of all ages with a team of 13 volunteers, while answering questions about stellar astrophysics and solar physics.

### **International Visual Literacy Association conference**

*Champaign, IL*

#### PECHAKUCHA SPEAKER

*Oct. 2023*

- Gave a short PechaKucha talk (20 slides, 20 seconds per slide) titled “*Cosmic Perspectives: How Astronomy Shapes Our View*” to an audience of 50 people at the closing reception of the conference

## Memberships

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American Astronomical Society

Dark Energy Science Collaboration

Lenswatch Collaboration

Strong Lensing Science Collaboration

VENUS Collaboration