



Amethyst S. Barnes

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Current Appointment

1st Year Astrophysics Masters Student
NASA's Cosmic Pathfinders Program – Student Leadership Council
The City Universities of New York, Graduate Center
NASA Goddard Space Flight Center
New York, NY
Greenbelt, MD

Citizenship: U.S., born resident

Languages: English (fluent), Spanish (limited proficiency)

Research Interest

Observational and computational cosmology, including studies of gravitational lensing by dark matter and studies of dark energy using type Ia supernovae; Instrumentation, including detector calibration and effects analysis.

Education

B.S. in Astronomy & Astrophysics

Florida Institute of Technology

Melbourne, Florida | May 2023

M.S in Astrophysics

The CUNY, Graduate Center

Manhattan, New York | Ongoing

Research Experience

Graduate Research | The CUNY, Graduate Center

Institutional Research | NASA Goddard Space Flight Center

Roman Space Telescope – Weak Gravitational Lensing Simulations | *Dr. Jeffrey Kruk, Dr. Ami Choi*

[Post-Baccalaureate] September 2023 – July 2024

[Internship] June 2023 - August 2023

- Using Python to create postage-stamp images of galaxies taken by the James Webb Space Telescope's NIRCam Imager
- Simulating JWST PSFs with WebbPSF to generate a PSF with the JWST filter closest to a Roman Space Telescope filter.
- Performing correction/removal of the JWST PSF using GalSim's HSM Module and measuring galaxy shapes
- Simulating an image of a simulated galaxy with the Roman Space Telescope detector effects added.
- Subtracting the original simulated galaxy and the galaxy with the detector effects added, being left with just the detector effects
- Collaborating with the Roman Simulation Working Group.

Roman Space Telescope – Wide Field Instrument Detector Effects Testing Data Analysis | *Dr. Ami Choi*

[Post-Baccalaureate] September 2023 – July 2024

- Aiding in the immediate data analysis from the Wide Field Instrument's thermal vacuum testing
- Analyzing Science Monitor data and comparing data between the first and second set of thermal vacuum testing
- Characterizing detector effects to determine whether the effect will bias weak lensing measurements

Undergraduate Research | Florida Institute of Technology

Stellar Mapping of the Milky Way Galaxy | *Dr. Luis Henry Quiroga-Nunez*

September 2022 – May 2023

- Created an ADQL query to perform a 3D spherical cone search around a sample of 104 masers within the arms of the Milky Way arms Crux-Scutum, Carina Sagittarius, and Outer Norma, and identified a total of 176,970 objects around the masers
- Constructed histograms to show the distribution of sources around each maser

Analyzing Jupiter Cloud Formation | *Dr. Csaba Palotai*

September 2020 – December 2021

- Analyzed images received from Jupiter's JunoCam and Voyager in order to observe where clouds were forming.
- Matched clouds to the region to gain a different perspective on the region as well as observe how the clouds changed over time.
- Used Python and the Ubuntu terminal to open the images received from JunoCam and Voyager in the XMMing software.

Technical Skills

Experienced Programming Languages and Packages: Python, GalSim, WebbPSF, Linux Command Prompt, JupyterLab, SAOImageDS9, MAST Portal, MATLAB, LaTeX, GitHub

Fundamental Programming Languages and Packages: SQL Query, ADQL Query, FORTRAN, VMware Horizon Client

Awards and Nominations

Recipient | The CUNY, Graduate Center Master's in Astrophysics Program (Fellowship) | The CUNY, Graduate Center | 2024

Recipient | NASA Early Career Scientist Spotlights - Featured Code 660 Scientist | NASA Goddard Space Flight Center | 2024

Recipient | The AAS FAMOUS Travel Grant | The American Astronomical Society | 2023

Assured | The GEM Fellowship | Fall 2024 Cycle

Recipient | NASA Astrophysics Science Division – Employee Spotlight | NASA Goddard Space Flight Center | 2023

Nominee | Black in STEM Celebration - Outstanding Educational Event | Florida Institute of Technology | 2023

Recipient | SEDS Space Vision Conference Travel Grant | Granted By: Florida Institute of Technology | 2022

Nominee | Student Employee of the Year | Florida Institute of Technology | 2022

Recipient | Cambridge AICE Diploma | Pembroke Pines Charter High School | 2018

Recipient | Hard Work Pays Off Scholarship | Execution Equals Monumental Change | 2018

Publications, Contributions, Invited Talks, and Proceedings

Publications

Survey Science with the Nancy Grace Roman Space Telescope Wide Field Instrument

Joshua E. Schlieder et. al.

17 June 2024

Early Career Perspectives for the NASA SMD Bridge Program

Jenna M. Cann, Arturo O. Martinez, Amethyst Barnes, Sara Doan, Feyi Ilesanmi, Margaret Lazzarini, Teresa Monsue, Carlos Pinedo, Nicole Cabrera Salazar, Amy Steele

23 Oct. 2023 | [arXiv:2310.15287](https://arxiv.org/abs/2310.15287)

Contributions

NASA Science Mission Directorate: Report from the Bridge Program Workshop Organizing Committee

Padi Boyd et. al.

16 Nov. 2023

Invited Talks, Proceedings, and Workshops

Focused N.F.I.T For A Different World Conference | *University of Southern California* | 2024

- **[Workshop Co-Leader]** Spacetime Calculator Hackathon (NASA's Cosmic Pathfinders Program)

NASA Post-Baccalaureate Symposium | *NASA Goddard Space Flight Center* | 2024

- **[Invited Speaker]** Modeling Weak Gravitational Lensing in the Roman Space Telescope Using JWST Observed Galaxies

NASA's Cosmic Pathfinders Program | *NASA Goddard Space Flight Center* | 2024

- **[Invited Speaker]** Cosmic Chatter Presentation (Modeling Weak Gravitational Lensing in the Roman Space Telescope Using JWST Observed Galaxies)

Conference for Undergraduate Underrepresented Minorities in Physics (CU²MiP) | *University of Maryland* | 2024

- **[Invited Speaker]** Flash Talks and Career Chats

ASTRO Careers Roadmap Workshop | *NASA Cosmic Pathfinders Program* | 2024

- **[Co-Coordinated and Co-Moderated]**

Physics and Space Science Program - Senior Seminar | *Florida Institute of Technology* | 2024

- **[Invited Speaker]** Astronomy & Astrophysics Alumni Talk

AAS Meeting 243 | *American Astronomical Society* | 2024

- **[Hyperwall Talk]** Roman Wide Field Instrument: From Ground Tests to Science
- **[iPoster]** Modeling Weak Gravitational Lensing in the Roman Space Telescope Using JWST Observed Galaxies
- **[Splinter Session]** NASA Cosmic Pathfinders Program: Hack Your Career

National Society of Black Physicists Conference | *National Society of Black Physicists* | 2023

- **[Invited Speaker]** Modeling Weak Gravitational Lensing in the Roman Space Telescope Using JWST Observed Galaxies

Physics and Space Science Program – Graduate School Information Seminar | *The Ortega Observatory* | *Florida Institute of Technology* | 2023

- **[Invited Speaker]** Astronomy & Astrophysics Alumni Talk

Internship Symposium | *NASA Goddard Space Flight Center* | 2023

- **[Invited Speaker]** Modeling Weak Gravitational Lensing in the Roman Space Telescope Using JWST Observed Galaxies

Black in Space Week | *National Space Council* | 2023

- **[Invited Guest]** Artemis Generation Roundtable | The White House
- **[Invited Guest]** Artemis Generation Forum | The Mead Center for American Theatre

Florida Tech Black in STEM Celebration | *Florida Institute of Technology* | 2022, 2023

- **[Co-Moderator]** Black in STEM Professionals Panel

Florida Tech Space Week | *Florida Institute of Technology* | 2023

- **[Co-Moderator]** Professor Research Seminar
- **[Co-Moderator]** Astronaut Talk
- **[Co-Speaker]** Astronaut Memorial and Vigil

Antarexxa | *Virtual* | 2022

- **[Co-Presenter]** Space Education for Emerging Space Nations Series – Florida Tech

Students for the Exploration and Development of Space | *Florida Institute of Technology*

- **[Co-Presenter]** Club presentation to the Dean of the College of Engineering and Science | 2022
- **[Co-Presenter]** Club presentation to the President of Virgin Galactic | 2022

Leadership, Service, and Outreach

Student Leadership Council | NASA Cosmic Pathfinders Program | NASA Cosmic Origins | *NASA Goddard Space Flight Center*

2023 - Ongoing

Roman Space Telescope Tours | Nancy Grace Roman Space Telescope | *NASA Goddard Space Flight Center*

2024

Focused N.F.I.T For A Different World Conference | A New Day Foundation | *University of Southern California*

2024

Conference for Undergraduate Underrepresented Minorities in Physics (CU²MiP) | Physics Department | *University of Maryland*

2024

Physics and Space Science Program – Senior Seminar | Astronomy & Astrophysics Department | *Florida Institute of Technology*

2024

Physics and Space Science Program – Graduate School Information Seminar | Ortega Observatory | *Florida Institute of Technology*

2023

iDesk Assistant | Evans Library | *Florida Institute of Technology*

2019 - 2023

Co-Organizer | NASA Bridge Program – Early Career Working Group Workshop | *NASA Goddard Space Flight Center*

2022

Space Education for Emerging Space Nations Series | Antarexxa | *Virtual*

2022

President | Students for the Exploration and Development of Space | *Florida Institute of Technology*

2022 – 2023

Co-Event Coordinator | *Florida Institute of Technology*

- **Space Week** | 2023
- **Black in STEM Celebration** | 2022 – 2023
- **Black in STEM Celebration** | 2021 – 2022

Social Media Manager | *Florida Institute of Technology*

2022 – 2023

- Students for the Exploration and Development of Space
- Society of Physics Students
- Student Astronomical Society

Co-Founder | Lost Musicians Society | *Florida Institute of Technology*

2022

Treasurer | Lost Musicians Society | *Florida Institute of Technology*

2022 – 2023

Vice President | Society of Physics Student | *Florida Institute of Technology*

2021 – 2022

Conferences

Focused N.E.I.T For A Different World Conference | *A New Day Foundation* | 2024

- [Workshop Co-Leader]

Conference for Undergraduate Underrepresented Minorities in Physics (CU²MiP) | *University of Maryland* | 2024

- [Flash Talks and Career Chats]

AAS Meeting 243 | *American Astronomical Society* | 2024

- [Splinter Session, Hyperwall Talk, iPoster Presentation]

NSBP Conference | *National Society of Black Physicists* | 2023

- [Oral Presentation]

Florida Tech Black in STEM Celebration | *Florida Institute of Technology* | 2023

- [Organized, Moderated and Attended]

SEDS Space Vision | *Students for the Exploration and Development of Space* | 2022

- [Attended]

Florida Tech Black in STEM Celebration | *Florida Institute of Technology* | 2023

- [Organized, Moderated and Attended]

NSBP Conference | *National Society of Black Physicists* | 2021

- [Attended]

Competitions

- **SEDS-SSPI Competition 2022 – 2023: Mars Gateway** | *Students for the Exploration and Development of Space – National*
2022 – 2023

Professional Affiliations

- The City University of New York, Graduate Center
- The Flatiron Institute Center for Computational Astrophysics
- The American Museum of Natural History
- Nancy Grace Roman Space Telescope – Project Science Team
- NASA Cosmic Pathfinders Program of the NASA Cosmic Origins
- Roman HLIS PIT
- American Astronomical Society (AAS)
- National Society of Black Physicists (NSBP)
- American Astronautical Society (AAS)
- Dark Sky Advocate
- Students for the Exploration and Development of Space (SEDS)

Soft Skills

- Leader
- Detail-Oriented
- Critical Thinking
- Problem Solving
- Effective Communication to a Broad Audience
- Organizational Behavior

Personal Hobbies

- Cooking
- Baking
- Gardening
- Art (drawing, painting, crocheting, crafting)
- Music
- Writing

- Optimism
- Amiable
- Design

- Exploring

References provided upon request.
