Grace Forrey

Post Baccalaureate · University of Connecticut

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Education

University of Connecticut *Storrs, CT*

BS Undergraduate Degree in Physics *August 2021 - May 2025*

- Minor in Astrophysics
- Senior thesis/undergrad research advisor: Dr. Jonathan Trump

Research Interests

Galactic Evolution: galactic structure; star formation; metallicity; dust distribution; high redshift.

Stellar Evolution: pre-main sequence; accretion disks; stellar modeling.

Black Holes: galaxy-black hole coevolution; active galactic nuclei.

Research Experience

University of Connecticut *Storrs, CT*

Post Baccalaureate Research Technician *September 2025 – Present*

- Research project within Dr. Aleksandra Kuznetsova's research group.
- Read literature and use MESA (Modules for Experiments in Stellar Astrophysics) to run models of pre-main sequence stars, studying how disk accretion influences stellar development; analyze results using Python.

University of Connecticut, Department of Physics *Storrs, CT*

Undergraduate Student Researcher *October 2023 – May 2025*

- Conducted astrophysics research under Dr. Jonathan Trump, collaborating closely with Dr. Raymond Simons.
- Analyzed JWST NIRISS spectroscopic data from the NGDEEP collaboration using Python; created spatially resolved dust and star formation maps of 14 galaxies using the Balmer decrement, supported by the NASA Connecticut Space Grant (Summer 2024).
- Calculated galaxy positions on the star formation–mass sequence and compared SED-based and dust-corrected star formation rates.
- Completed a senior thesis and prepared a paper for publication, which was published to arXiv on December 12th.

NASA Connecticut Space Grant *Storrs, CT*

Undergraduate Summer Researcher *June 2025 - August 2025*

- Worked closely with Dr. Jonathan Trump and Dr. Raymond Simons.
- Used previously produced dust distributions for a diverse sample of early-universe galaxies and calculated dust-corrected SFR surface density using Python.
- Compared dust-corrected SFR surface density with attenuation at $H\alpha$ for 14 galaxies, finding that in most cases both star formation and attenuation peak in the galactic centers and decline toward the outskirts.
- Reviewed and discussed literature weekly to better understand the field and the methodology for calculating dust-corrected SFR.

Early Research Experience

Advanced Research Mentorship *Glastonbury, CT*

High School Student *August 2020 - June 2021*

- Secured a year-long research mentorship under Prof. Christopher Elphick (Dept. of Ecology & Evolutionary Biology, University of Connecticut).
- Studied non-migratory bird behavior in Connecticut, analyzing seasonal behavioral changes with a focus on house sparrows.

Professional Experience

Greenwich Hospital *Greenwich, CT*

Chemist Tech *September 2021 - January 2022*

- Worked in Central Processing and the Microbiology lab
- Took samples that are sent from around the hospital and process them by making sure they get to the right departments so the correct tests can be run
- Processed COVID tests, urine cultures, and other tests within the Microbiology lab

Publications

Forrey, G. M., Simons, R. C., Trump, J. R., Shen, L., Koekemoer, A. M., Bagley, M. B., Finkelstein, S. L., Papovich C., Pirzkal, N., "NGDEEP: A New Non-Parametric Measure of Local Star-Formation and Attenuation at Cosmic Noon," arXiv:2512.11989, submitted to ApJ.

Grants

Summer 2024 **Undergraduate Research Grant**, NASA Connecticut Space Grant Consortium *$ 6,000*

Presentations

November 8, 2024. *Balmer Decrements at* $1 < z < 3$. Poster Session: 2024 NASA CT Space Grant Annual Grants Expo, CT.

September 17, 2024. *Opportunities in STEM (Physics and Astronomy)*. Guest Lecture, RHAM High School, Hebron, CT.

Relevant Coursework

Stars and Compact Objects
Galaxies & Interstellar Medium
Techniques Modern Astrophysics
Quantum Mechanic I
Mechanics I
Electricity and Magnetism I
Research Thesis in Physics
Computational Physics
Foundation Modern Astrophysics
Development of Quantum Physics
Advanced Undergraduate Lab
Electricity and Magnetism II

Honors, Awards, and Memberships

Spring 2025 - Present **Sigma Pi Sigma Honors Society**, Member
January 2024 - May 2024 **Dean's List**, University of Connecticut
May 2023 **Uconn Stamford Physics Award**, University of Connecticut

Leadership

April 2024 - May 2025 **Women in Physics**, Treasurer *Storrs, CT*

Conferences

APS CU*IP *Storrs, CT*

University of Connecticut *January 24-26, 2025*

- Helped organize students to attend the event and helped set up before the events started
- Went to panels and talks and networked with fellow conference attendees

Technical Skills

Programming Languages: Python; FORTRAN; Julia

Software & Application: MESA; NumPy; AstroPy; SciPy; Matplotlib; Jupyter Notebook; VS Code.

High-Performance Computing: SLURM workload manager; batch job scripting.

Data Management: Globus (large-scale dataset transfer).