

# Olivia Allegra Greene

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## EDUCATION

### Vanderbilt University

*PhD Candidate - Astrophysics*

Nashville, TN

Aug, 2020 - Present

### Fisk University

*Master of Science - Physics*

Nashville, TN

Aug, 2017 - 2020

### Florida Atlantic University, Harriet L. Wilkes Honors College

*Bachelor of Science - Physics, with Minors in Mathematics & English Literature*

Jupiter, FL

Aug, 2013 - May, 2017

### Palm Beach State College

*Associate of Arts*

Lake Worth, FL

Aug, 2006 - 2013

## RESEARCH EXPERIENCE

### Vanderbilt University

*Astrophysics PhD Candidate — Advisor: Dr. Kelly Holley-Bockelmann (Full-time)*

Nashville, TN

Aug, 2020 - Present

- **Dissertation Research:** Curate complete Integral Field Spectroscopic (IFS) catalog of E+A galaxies within the final MaNGA product launch (MPL-11), using the refined classification method developed during my Master's tenure, and perform preliminary investigations into possible AGN activity within the catalog.
- Co-founded The Neuroverse Initiative, 2024.
- Awarded Vanderbilt University's **Robert T. Lagemann Award** for exceptional promise in physics, 2021.

### Fisk-Vanderbilt Master's-to-PhD Bridge Program

*Physics Graduate Researcher — Advisor: Dr. Kelly Holley-Bockelmann (Full-time)*

Nashville, TN

Aug, 2017 - 2020

- **Master's Thesis:** Created a refined system for the identification of E+A galaxies using the Integral Field Spectroscopic, MaNGA Survey. Title: "Refining the E+A Galaxy: A Spatially Resolved Spectrophotometric Sample of Nearby Post-starburst Systems in SDSS-IV MaNGA (MPL-5)."
- Graduated **Summa Cum Laude** from Fisk University.

### Florida Atlantic University

*Undergraduate Researcher — Advisors: Dr. Andrew Johnson & Dr. Charles T. Liu (Part-time)*

Jupiter, FL

Aug, 2016 - 2017

- **Honors Thesis:** Continuing the work from my REU internship in classifying and modeling Spectral Energy Distributions for E+A galaxies, I completed my undergraduate Honors Thesis. Title: "Preliminary Finding & Spectral Energy Distributions For Nearby E+A Galaxies Using the MaNGA Survey."
- Graduated with **Honors Degree** from the Harriet L. Wilkes Honors College.

### American Museum of Natural History

*REU Intern — Advisor: Dr. Charles T. Liu (Full-time)*

New York, NY

May - Aug, 2016

- **Classified** Post-Starburst, E+A galaxies from the SDSS-IV-MaNGA Survey's 4th Product Launch (MPL-4).
- **Created** multiwavelength SEDs using GALEX, SDSS, 2MASS and WISE data.
- **Developed** emission-line line ratio and AGN diagnostic plots for the curated sample.

## EMPLOYMENT, TRAINING, DEVELOPMENT AND MENTORING EXPERIENCE

### The Neuroverse Initiative, INC

*Chief Financial Officer & Director of SciComm Events*

Nashville, TN

Sept, 2024 - Present

- **Co-founded** a 501(c)(3) organization that works at the intersection of space science and neurodiversity.
- **Oversees** financial operations, maintains financial records, manages filing of government compliant documents, and all legal contracts and documents.
- **Directs** science communication events and conventions, including organizer liaison, panelist preparation, and merchandise management for advocacy and fundraising, and **develops** panels and SciComm resources for my role as presenter at conventions.
- **Supports** CEO and Board of Directors in daily operations.

### EMIT Program at Vanderbilt University

*Summer Program Planning Committee Member*

Nashville, TN

Mar - Aug, 2023

- Developed interactive planning schedule for committee members, and assisted in developing program structure, activities, and final project.
- Created online application form for prospectives, reviewed applications, and made final admission decisions.
- Communicated with enrolled students on various program topics.
- Coordinated "Allyship in the Workplace" seminar, including speaker booking.

**Vanderbilt University***Instructor of Record for Astronomy Lab*

Nashville, TN (Remote)

May - Jun, 2021

- Led expedited 4-week Introductory Astronomy Lab, independently.
- Condensed 13-week curriculum into 4 weeks.
- Managed all aspects of course, including assignment upload/release via TopHat, weekly grading via Brightspace, final project review and final grade submission into university's records system.
- Conducted M-Th, daily lab sessions and provided student support.

**Vanderbilt University***Teaching Assistant for Astronomy Lab*

Nashville, TN (Remote)

Aug, 2020 - May, 2021

- Facilitated weekly lab sessions for Introductory Astronomy Course.
- Held office hours and provided email support.
- Graded labs, extra credit materials, and final poster presentations.

**American Museum of Natural History***REU Mentor*

New York, NY

May 2017 - 2019

- Traveled annually to New York to introduce & guide REU participants through their current research project.
- Mentored REUs in IFS classification, data mining with Marvin, and All-Sky Survey usage.
- Guided research production, poster/talk preparations, and conference readiness.
- Managed on-boarding of new participants into SDSS collaboration.
- Sustained long-term mentoring relationships beyond program conclusion.

**Florida Atlantic University***Teaching Assistant for Astronomy Department*

Boca Raton, FL

Aug, 2016 - 2017

- Assisted with Astronomy 101 and Solar System Astronomy Courses.
- Held biweekly office hours and provided individual/group tutoring for astronomy courses & math practice.
- Graded and proctored quizzes, tests, and math practice assignments.
- Converted course materials from Blackboard to Canvas platform.

**Florida Atlantic University***Assistant Observatory Lecturer and Technician*

Boca Raton, FL

Aug, 2016 - 2017

- Observatory Operations: Managed telescope and dome setup, operation, and shutdown for public and student observations. Conducted regular maintenance, including balancing, positioning, and weather management of the telescope throughout the year.
- Educational Support: Assisted with pre-observation lectures, provided in-depth answers to participant questions, and facilitated hands-on experimental demonstrations to enhance learning experiences.

**OUTREACH INITIATIVES****Creation Entertainment's Star Trek Conventions***Astronomy Expert & Science Communications Panelist*

Nationwide

Sept, 2024 - Present

- **SciComm Panels:** Present a series of astrophysics panels at Star Trek conventions through The Neuroverse Initiative's Advocacy and Outreach arm.
- Explain complex astrophysics concepts using Star Trek themes for public engagement.
- Topics include: Kardashev Scale, habitable exoplanets, Europa, galactic archaeology and evolution.
- **Exhibit Hall:** Host table promoting astronomy, neurodiversity, and their intersection.
- Facilitate discussions on Star Trek-related space questions with attendees.
- Manage fundraising activities including donations, raffles, and prize giveaways.

**AAS Pre-Conference Workshop: How to Conference Successfully***Workshop Facilitator, The Neuroverse Initiative*

Nationwide

Jan, 2024 &amp; Jan, 2025

- Co-facilitated workshop for early career astronomers, first-time attendees, & neurodivergent individuals.
- Helped implement curriculum covering:
  - Effective use of social media at conferences.
  - Schedule management and organization.
  - Self-care strategies.
  - Presentation skills and talking about one's work.
- Created and assembled participant handout folders with curated resources.
- Designed and developed workshop webpage, including maps and annotated topic schedules.
- Managed workshop logistics: room setup, participant sign-in, and on-site support.
- Facilitated open discussions and provided individualized guidance to attendees.
- Contributed to tailoring content for diverse attendees, including neurodivergent individuals.

## **Adventure Science Center**

*Astronomy Event Coordinator & Presenter*

Nashville, TN

*May, 2022 - Present*

- Coordinate and lead astronomy events in partnership with Vanderbilt Physics and Astronomy Department.
- Organize both children's and adult events, tailoring content to age range and event theme.
- Ongoing initiative to promote astronomy education and public engagement.
- Representative Events:
  - Green Week: Presented on exoplanets and Mars terraforming; demonstrated gravity, spectroscopy, cratering, and planet-moon size comparisons.
  - Star Trek event: Delivered talks, managed spectroscopy booth, and led astronomy & pop-culture trivia.
  - TN STEAM Festival: Facilitated solar observations, spectroscopy demonstrations, sundial and pinhole camera construction for partial eclipse viewing.

## **Adventure Science Center**

*Exhibit Designer and Content Curator*

Nashville, TN

*In Progress*

- Designed and proposed "The Many Faces of Astronomy," a diversity-focused exhibit.
- Curated profiles of 5 influential space scientists for initial interactive digital display, with expansion plans.
- Developed content for existing interactive digital interface to enhance visitor engagement.
- Incorporated multilingual content based on MNPS student demographics (40% non-English primary language).
- Tailored exhibit to Nashville's highly diverse demographic profile, using MNPS data representing students from multiple ethnic and linguistic backgrounds.
- Integrated current demographic data on astronomers to highlight need for increased diversity in the field.
- Aimed to inspire scientific literacy and interest among underrepresented youth through informal learning.

## **Ask-An-Astronomer**

*Founder / Creator / Presenting Astrophysicist*

Nashville, TN

*May, 2021 - Present*

**Mission:** To encourage, inspire, and maintain a diverse, scientifically literate youth.

- Created an astronomer-led program for K-12 students to engage with, and learn from career astrophysicists.

### **Flagship Event**

May 2021

- Two-day virtual event at a Metro-Nashville middle school, with 6 Vanderbilt-based astronomers, leading discussions for six 7th grade classrooms, over four 80-minute class sessions.
- Each presentation included a short description of the presenting astronomer's research, their personal path to becoming an astronomer, and a Q&A session with pre-submitted and follow-up questions from students.

### **The School for Science and Math at Vanderbilt, Guest Lecturer**

Nov 27, 2023

- Contributed expertise to the topic: "How far can we see into the universe?" for 9th grade STEM students.
- Conducted an interactive lecture on the physics of light and spectroscopy as a map to the universe's contents.
- Focused on galactic spectra and evolution, enhancing students' understanding of cosmic structures.
- Facilitated hands-on learning via interactive demonstration using emission lamps and diffraction gratings.

### **H. G. Hill Middle School, Guest Lecturer**

Oct 25, 2023

- Presented "Spectroscopy 101" to 8th grade class, introducing fundamental concepts of light.
- Covered the electromagnetic spectrum and its wide-ranging applications in astronomical research.
- Conducted demonstration with emission lamps and diffraction gratings to visualize spectral phenomena.
- Created and implemented a custom worksheet to reinforce learning objectives.
- Facilitated an in-depth Q&A session, addressing students' curiosities about astronomy and astrophysics.

### **Pinecrest Academy Avalon K-5, Virtual Guest Lecturer**

May 20, 2022

- Expanded program to Florida, delivering a virtual 1 hour presentation to five 6th and 7th grade classes.
- Shared personal non-traditional journey, with a focus on astrophysics, to inspire diverse paths in astronomy.
- Engaged students with interactive content on the role of astrophysicists in modern science.
- Provided curated astronomy resources for students to explore and participate in citizen science projects.

## **Galaxy Quest!**

*Author/Project Developer for Citizen Science Research*

Hybrid

*Mar, 2022 - Dec, 2024*

- Developed a citizen science project to classify E+A galaxies from the 11th & final MaNGA Product Launch.
- Implemented an updated version of The Falcone Method for streamlined data processing and analysis, using Google Drive for efficient data management and progress tracking.
- Created a Jupyter Notebook for spectroscopic measurements of equivalent widths, to serve as a research tool
- Managed a diverse team of 27 citizen scientists across 3 countries, 8 United States, and 5 academic career stages.
- Led comprehensive double-blind classification of 10,248 galaxies, implementing rigorous quality control measures to ensure accuracy and consistency in galaxy classifications.

- Developed training materials for single-fiber classifications and equivalent width measurements.
- Facilitated the first publication opportunity for many citizen scientist participants.

## Florida Atlantic University

Boca Raton, FL

Guest Lectured Undergraduate Intro to Astronomy Course

Dec, 2016

- Presented overview of APO 2.5-meter telescope, MaNGA Survey and E+A Galaxies to 200+ students.
- Shared insights on field research experiences, and astronomy community involvement.

## PUBLICATIONS

5. **Greene, O. A.**, et al. “A Complete Catalog of Post-starburst, E+A Galaxies in SDSS-IV MaNGA (MPL-11): A Citizen Science Approach to Spectrophotometric Classification & the Automation of Equivalent Width Measurements.” (In Prep for ApJ; Estimated Submission: Summer, 2025).
4. **Greene, O. A.**, et al. “Refining the E+A Galaxy: A Spatially Resolved Spectrophotometric Sample of Nearby Post-starburst Systems in SDSS-IV MaNGA (MPL-5)” (April 2021); ApJ, 910, 162
3. Ludwig, E., Iyer, K., Liu, C. T., Grwisser, E. and **Greene, O. A.** “Comparing Star Formation Histories and Evolutionary Pathways of Post-Starburst and E+A Galaxies in TNG50 and SDSS-IV MaNGA” (In Submission.)
2. Marinelli, M., **Greene, O. A.**, Riffel, R. A., Rowlands, K., & Liu, C. “SDSS-IV MaNGA: A Dwarf E+A Galaxy Quenched by AGN Feedback” (July 2020); RNAAS, 4, 110
1. Penny, S., Masters, K., L., Smethurst, R., Nichol, R. C., Krawczyk, C. M., Bizyaev, D., **Greene, O. A.**, Liu, C., et al. “SDSS-IV MaNGA: Evidence of the importance of AGN feedback in low-mass galaxies.” (May 2018); MNRAS, 476(1):979–998

## PRESENTATIONS

12. **PhD Dissertation Defense:** “The E+A Galaxy: Refining, Cataloging & Investigating A Complete Spatially Resolved Integral Field Spectrophotometric Sample of Nearby Post-starburst Systems in SDSS-IV MaNGA (MPL-11)” ; Vanderbilt University (Scheduled defense June, 2025).
11. **Talk:** “The Neuroverse Initiative: How to Access Neuroinclusion Programs and Training”, American Astronomical Society (AAS) Meeting Abstracts, Vol. 57, 246.09; National Harbor, MD (Jan, 2025).
10. **Poster:** “Finalizing A Complete Catalog of E+A Galaxies in SDSS IV-MaNGA: A Citizen Science Approach to Spectrophotometric Classification & the Automation of Equivalent Width Measurements.”, AAS Meeting Abstracts, Vol. 57, 158.14; National Harbor, MD (Jan, 2025).
9. **Dissertation Talk:** “The E+A Galaxy (Olivia’s Version): Refined, Cataloged & Investigated using SDSS-IV MaNGA”, AAS Meeting Abstracts, Vol. 56, 443.06D; New Orleans, LA (Jan, 2024).
8. **Poster + Lightning Talk:** “Complete Catalog of Spatially-Resolved E+A Galaxies from SDSS IV-MaNGA (MPL-11) and Preliminary Results of Quenching Mechanism Investigation”, Resolving Galaxy Ecosystems Across All Scales; Hong Kong, China (Dec, 2023).
7. **Poster:** “Investigating Quenching in a Spatially Resolved Catalog of E+A Galaxies from SDSS-IV MaNGA”, AAS Meeting Abstracts, Vol. 55, 408.04; Seattle, WA (Jan, 2023).
6. **Master’s Thesis Defense:** “Refining the E+A Galaxy: A Spatially Resolved Spectrophotometric Sample of Nearby Post-starburst Systems in SDSS-IV MaNGA (MPL-5)” ; Fisk University - Remote (July, 2020).
5. **Talk:** “Refining the E+A Galaxy: A Spatially Resolved Spectral Analysis & Synthesis of Nearby Post-Starburst Systems in SDSS-IV MaNGA (MPL-5)”, AAS Meeting Abstracts, Vol. 235, 258.02; Honolulu, HI (Jan, 2020).
4. **Poster:** “Refining the E+A Galaxy: A Spatially Resolved Spectral Analysis & Synthesis of Nearby Post-Starburst Systems in SDSS-IV MaNGA (MPL-5)”, AAS Meeting Abstracts, Vol. 233, 145.06; Seattle, WA (Jan, 2019).
3. **Poster:** “Behind the Curtain: Revealing the effect of sub-grid models on supermassive black hole merger rates for LISA”, AAS Abstracts, Vol. 233, 141.09; Seattle, WA (Jan, 2019).
2. **Poster:** “Spectral Analysis, Synthesis and Energy Distributions of Nearby E+A Galaxies Using SDSS-IV MaNGA”, American Astronomical Society Meeting Abstracts, Vol. 229, 347.55; Dallas, TX (Jan, 2017).
1. **Talk:** “Preliminary Findings & Spectral Energy Distributions of Nearby E+A Galaxies,” The American Museum of Natural History; New York, NY (Aug, 2016).

## SKILLS SUMMARY

Languages:	Python, LaTeX, SQL
Platforms:	Mac, Windows, Linux Virtual Box
Tools:	Marvin (terminal and web-based), SDSS TRAC, SDSS SciServer, IRAF, GitHub, TAPVizieR
Soft Skills:	Public Speaking, Presentation Writing, Leadership, Event Management, Paper Writing and Editing, Data Reduction and Analysis, Proficient in Creating and Maintaining Organizational Data Systems.
Collaborations:	MaNGA Survey, Sloan Digital Sky Survey (SDSS), Fisk-Vanderbilt Master’s-to-PhD Bridge Program, Establishing Multimessenger Astronomy Inclusive Training (EMIT) Program