



# Joshua Bardwell

Master's of Astronomy  
& Astrophysics  
San Diego State University, San Diego CA

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LinkedIn

## EDUCATION

Degree	Institute	GPA	Year
Master's Astronomy	San Diego State University, San Diego CA	3.60	2022-2024
BS Engineering, <i>cum laude</i>	California Polytechnic State University, San Luis Obispo CA	3.54	2017-2022

## RESEARCH

- **SDSU & NASA, Astronomy & Physics** Mar 2023 - May 2024  
*Master's Thesis* San Diego CA
  - Developing gravitational waveform models for extreme mass ratio inspirals (EMRI, specifically stellar mass black holes orbiting supermassive black holes) for the future LISA mission
  - Expanding upon current EMRI waveform models by exploring unexplored dimensions of the parameter space (i.e. eccentricity and inclination)
  - Using Chebyshev polynomials to approximate alternative functions to interpolate trajectory information
- **CalPoly, Astronomy & Physics** June 2021 - June 2022  
*Undergraduate Thesis* San Luis Obispo CA
  - Utilized tools in Astroconda and Python to develop an in-depth analysis of companion galaxy interaction with a sample set of 23 host Brightest Cluster Galaxies (BCG's)
  - Provided inverted color scale images of our dataset BCG's using DS9 imaging software
  - Consolidated the team's work and wrote the paper from abstract to conclusion (currently out for review)
  - Completed a second project which improved models for BCG spectral emission analysis and AGN classification using Gaussian & Lorentzian fitters

## INTERNSHIPS

- **NASA, Goddard Space Flight Center** Jan 2023 - May 2023  
*Software Development Intern* Greenbelt MD
  - Developed a program named DARMA: Detection Automation of Rotational-peaks and Molecular Assignment.
  - Automated the peak assignment process, by devising an algorithm to efficiently cross reference millions of molecular catalogue transition peaks in under 1 minute.
  - Developed a program to automate the Boltzmann analysis in a series of narrow-band scans
  - Will be a coauthor on a paper which will apply these data analysis programs to an ice sample experiment made of para and ortho-formaldehyde
- **NASA, Goddard Space Flight Center** June 2022 - Aug 2022  
*Software Development Intern* Greenbelt MD
  - Implemented PySpecTools to automate the peak finding and molecular line assignment process in the experimental analysis portion of paper documentation
  - Provided post-assignment analytics to further visualize and comprehend the molecular assignments made
  - Developed a molecular folder which hosts all major catalogue files from JPL and CDMS
  - Developed programs which sort these files into subdirectories dependent on the elemental composition and then converts them to a YAML directory
  - Presented all findings at the NASA OSTEM intern presentation session
  - Created multiple logos and T-shirts for SubLIME labs and the JWST TSS (James Webb Space Telescope Team Solar System) group
- **Northrop Grumman, James Webb Space Telescope** June 2020 - Aug 2020  
*Program Management Intern* Greenbelt MD
  - Developed an original campaign plan for the JWST including an apparel line, influencer marketing, and an outline for a television launch event
  - Created a video kiosk explaining all the different aspects of the telescope anywhere from the engineering designs accustomed for infrared wavelengths to the scientific need for a more advance optical instrument beyond the Hubble
  - Presented all projects listed above to the Vice President of the JWST, the campaign team of the JWST, and both the head of Public Relations for the JWST at NASA & Northrop Grumman

## TECHNICAL SKILLS

- **Programming Languages:** Python, Latex, MATLAB, HTML
- **Tools and Frameworks:** Jupyter, PyCharm & Overleaf
- **Programs:** Github, Illustrator, Ds9, SolidWorks, InDesign, JMP, Google & Microsoft Suite

AWARDS

–**Academic:** NSF ACS Bridge Professional Development Award | Ruth & Clifford Smith Astronomy Fellowship | Theodore William & Nhung Lu Booth Scholarship, 2022-2024 | B.S. Engineering *cum laude* | President’s List, 2022-2023 | Dean’s List, Winter 2018 | Dean’s List, Spring 2018 | Dean’s List, Spring 2019 | Dean’s List, Winter 2019 | Dean’s List, Winter 2020 | Dean’s List, Fall 2021 | Dean’s List, Winter 2022 | Dean’s List, Spring 2022

TEACHING

- **Mount Laguna Observatory**  
*Astronomy Lecturer* May 2023 - Aug 2023  
San Diego CA
- **SDSU Training Astronomy Research Scholars**  
*Graduate Research Instructor* Sep 2022 - May 2024  
San Diego CA
- **SDSU Math Learning Center**  
*Calculus and Physics Tutor* Sep 2022 - May 2024  
San Diego CA
- **CalPoly Learning Center**  
*Dynamics, Physics, and Calculus Tutor* Mar 2021 - Jun 2022  
San Luis Obispo CA

PRESENTATIONS

- **American Chemical Society (ACS): Poster Presentation**  
*DARMA: Detection Automation of Rotational-peaks and Molecular Assignment* Aug 2023  
San Francisco CA
- **Stockton College: Thesis Presentation**  
*Master’s Research Overview* Aug 2023  
San Diego CA
- **American Astronomical Society (AAS): Poster Presentations**  
*DARMA: Detection Automation of Rotational-peaks and Molecular Assignment* June 2023  
Albuquerque NM
- **NASA Code 600 Final Intern Presentation**  
*PySpecAlpha: Automated Peak Assignmentments for Broadband and Narrowband Spectra* April 2023  
Greenbelt MD
- **NASA OSTEM Final Intern Presentation**  
*PySpecTools: Automated Peak Assignments for Cometary Broadband Spectra* April 2023  
Greenbelt MD
- **CalPoly Undergraduate Thesis Presentation**  
*The Effects of Minor and Major Mergers in the Growth and Morphology of Brightest Cluster Galaxies* May 2022  
San Luis Obispo CA
- **ManGa Quarterly Review**  
*The Effects of Minor and Major Mergers in the Growth and Morphology of Brightest Cluster Galaxies* Nov 2021  
San Luis Obispo CA
- **Frost Symposium**  
*Understanding Dynamical Friction Timescales with Brightest Cluster Galaxies and their Companion Galaxies* Aug 2021  
San Luis Obispo CA
- **ManGa Quarterly Review**  
*Understanding Dynamical Friction Timescales with Brightest Cluster Galaxies and their Companion Galaxies* July 2021  
San Luis Obispo CA
- **Northrop Final Intern Presentation**  
*Inspiring Gen Z’s in the JWST through the utilization of a Virtual Launch Event, Apparel Line, and M8 ReDesign* Aug 2020  
Greenbelt MD

LEADERSHIP

- **Design For America**  
*President* Sep 2017 - Sep 2019  
San Luis Obispo CA
- **CalPoly Business Marketing**  
*Mentor Lead* Sep 2019 - Dec 2019  
San Luis Obispo CA
- **Week of Welcome**  
*Orientation Leader* Jan 2018 - Sep 2018  
San Luis Obispo CA

INTERESTS

Music creation, surfing, long-boarding, rock-climbing, photography, dietary trends and nutrition, and clothing design