

Tyler Parsotan

Education

- 2015–2021 **Ph.D. Physics**, *Oregon State University*, Corvallis, OR, GPA: 3.74.
Advisor: Dr. Davide Lazzati
Topic of Research: Gamma Ray Bursts
- 2019–2020 **M.Eng. Mechanical Engineering**, *Oregon State University*, Corvallis, OR, GPA: 3.74.
Specialty: Thermal Fluid Sciences – Experimentation and Modeling
- 2015–2018 **M.S. Physics**, *Oregon State University*, Corvallis, OR, GPA: 3.89.
Advisor: Dr. Davide Lazzati
Topic of Research: Gamma Ray Bursts
- 2011–2015 **B.S. Space Physics with Honors**, *Embry-Riddle Aeronautical University*, Daytona Beach, FL, GPA: 3.65.
Minor in Computer Science
Minor in Applied Mathematics

Professional Experience

- 2021–Present **Postdoctoral Research Assistant**, NASA Goddard.
- Researching radiation transfer mechanisms in Gamma Ray Bursts
 - Continually developing and using the Monte Carlo Radiation Transfer (MCRaT) software and the ProcessMCRaT software
 - Conducting operations support for the Swift Burst Alert Telescope (BAT) and enhancing data analysis pipelines
 - Developing the *BatAnalysis* python pipeline to facilitate the increased use of BAT survey data by the astrophysics community
 - Aided in the recovery of 3 blocks of detectors which were previously not producing data for over a year
 - Responsible for ensuring that BAT is properly calibrated
 - Responsible for the BAT Transient Monitor
 - Leading efforts to prepare the BAT for the O4 GW observing run to maximize the science output
 - Investigating ways to decrease noise in the detector to increase sensitivity to astrophysical sources
 - Continually developing the NITRATES code which conducts forward modeling based searches for astrophysical signals in BAT event data
 - Developing an image analysis pipeline for rapid searches of sources
- 2015–2021 **Research Assistant**, Oregon State University.
- Developed the Monte Carlo Radiation Transfer (MCRaT) high performance computing software
 - Developed the ProcessMCRaT python package
 - Researching radiation transfer mechanisms in Gamma Ray Bursts using the MCRaT and ProcessMCRaT codes
 - Conducted CITI Responsible Conduct of Research
 - Conferred the NASA FINESST Fellowship
 - Awarded two honorable mentions for the NSF Graduate Research Fellowship
 - NSF East Asia and Pacific Summer Institutes Fellow
 - Accepted to the NASA FERMI Summer School
 - AAS Astronomy Ambassador

NASA GSFC – 8800 Greenbelt Rd, Greenbelt, MD – 20771

📞 631-680-6566 • ✉ tyler.parsotan@nasa.gov

🌐 asd.gsfc.nasa.gov/Tyler.Parsotan/

- June–August 2018 **Kavli Summer Program Fellow**, Flatiron Institute, CCA.
- Part of a select group of graduate students accepted to collaborate with world experts in galaxy formation astrophysics on novel research in this area
 - Worked with Dr. Chris Hayward, Dr. Daniel Angles-Alcazar, and Dr. Jennifer Lotz on evaluating the importance of Black Holes in galaxy evolution models
 - Developed a pipeline to measure the sizes of simulated galaxies from mock observed images and compare the sizes to those of real galaxies
 - Able to quickly learn about another field and become proficient enough to contribute to the field through a number of publications
- 2015–2017 **Teaching Assistant**, Oregon State University.
- Taught undergraduate students in the lab section of the astronomy class
 - Topics covered include: crater formation, relative sizes of celestial objects, light and matter, and stellar evolution
 - Able to communicate complex ideas in a clear, concise manner to students with a variety of backgrounds

Publications

- Publication **Tyler Parsotan**, Laha, S., et. al. 2023, "*A Comprehensive Python Pipeline for Swift BAT Survey Analysis*", In Progress.
- Publication **Tyler Parsotan** and Ito, H. 2022, "*GRB Prompt Emission: Observed Correlations and Their Interpretations*", *Universe*, 8, 310.
- Publication Laha, S., Wadiasingh, Z., **Tyler Parsotan** et. al. 2022, "*Limits on the Hard X-Ray Emission From the Periodic Fast Radio Burst FRB 180916.J0158+65*", *ApJ*, 929, 173.
- Publication **Tyler Parsotan** and Lazzati, D. 2022, "*Photospheric Prompt Emission From Long Gamma Ray Burst Simulations – II. Spectropolarimetry*", *ApJ*, 926, 104.
- Publication **Tyler Parsotan** and Lazzati, D. 2021, "*Photospheric Prompt Emission From Long Gamma Ray Burst Simulations – I. Optical Emission*", *ApJ*, 922, 257.
- Publication **Tyler Parsotan**, Cochrane, R., Hayward, C. et. al. 2021, "*Realistic mock observations of the sizes and stellar mass surface densities of massive galaxies in FIRE-2 zoom-in simulations*", *MNRAS*, 501, 1591.
- Publication **Tyler Parsotan**, Lopez-Camara, D. and Lazzati, D. 2020, "*Photospheric Polarization Signatures From Gamma Ray Burst Simulations*", *ApJ*, 896, 139.
- Publication Cochrane, R., Hayward, C., Anglés-Alcázar, D., Lotz, J., **Tyler Parsotan** et. al. 2019, "*Predictions for the spatial distribution of the dust continuum emission in $1 < z < 5$ star-forming galaxies*", *MNRAS*, 288, 1779.
- Publication **Tyler Parsotan**, Lopez-Camara, D. and Lazzati, D. 2018, "*Photospheric Emission From Variable Engine Gamma Ray Burst Simulations*", *ApJ*, 869, 103.
- Publication **Tyler Parsotan** and Lazzati, D. 2018, "*A Monte Carlo Radiation Transfer Study of Photospheric Emission in Gamma Ray Bursts*", *ApJ*, 853, 8.

Selected Presentations

- Presentation *Time-resolved and Time-integrated Spectro-polarimetry Predictions of Gamma Ray Bursts*. Astrophysical Polarimetry in the Time-Domain Era. Lecco, IT. August 2022
- Presentation *Monte Carlo Simulations of Photospheric Emission in Gamma Ray Bursts*. Invited Talk to the Sixteenth Marcel Grossmann Meeting. Virtual. July 2021
- Presentation *Demystifying the Prompt Emission of Gamma Ray Bursts*. HEAD Frontier Seminar. Virtual. April 2021
- Presentation *Photospheric Polarization Signatures of Long Gamma Ray Bursts*. NASA Goddard Colloquium. Virtual. June 2020

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- Presentation *Photospheric Polarization Signatures of Long Gamma Ray Bursts*. HEAP Seminar. UNAM. May 2020
- Presentation *Numerical Simulations of the Dynamics and Radiative Properties of Gamma Ray Burst Jets*. Fifty One Ergs. Raleigh, NC. May 2019
- Presentation *Photospheric Polarization Signatures of Long Gamma Ray Bursts*. SSO Seminar. Corvallis, OR. April 2019
- Presentation *Monte Carlo Radiation Transfer in Long GRBs*. Theories of Astrophysical Big Bangs. RIKEN, Japan. November 2017
- Presentation *Monte Carlo Modeling of Photospheric Emission in Gamma Ray Bursts*. Invited Seminar. Kanazawa University, Japan. August 2017
- Presentation *Monte Carlo Modeling of Photospheric Emission in Gamma Ray Bursts*. Invited Seminar. RIKEN, Japan. June 2017
- Presentation *Investigating Photospheric Emission using the Monte Carlo Radiation Transfer (MCRaT) Code*. Fifty One Ergs. Corvallis, OR. June 2017

Awards and Accomplishments

- January 2020 Designated an AAS Astronomy Ambassador
- June 2019 Awarded the NASA FINESST Fellowship
- June 2019 Awarded the OSU Department of Physics Graduate Research Award
- June 2019 Awarded the OSU College of Science Larry W. Martin & Joyce B. O'Neill Endowed Fellowship (Declined)
- June 2018 Accepted to the Kavli Summer Program In Astrophysics: On The Astrophysics of Galaxy Formation
- May 2018 Accepted to the 2018 NASA FERMI Summer School
- September 2017 Awarded the Oregon Museum of Science and Industry Science Communication Fellowship
- June 2017 Awarded the NSF East Asia and Pacific Summer Institutes (EAPSI) Fellowship
- April 2017 & 2016 Awarded an Honorable Mention by the National Science Foundation's Graduate Research Fellowship Program
- March 2017 Designated as a NASA Oregon Space Grant Graduate Student Astronomer-in-Residence
- June 2016 Co-Organized first Astronomy Open House at Oregon State University
- May 2015 Awarded Oregon State University's Graduate Diversity Award
- April 2013 Inducted into the Ronald E. McNair Postbaccalaureate Achievement Program

Community Activities

- July 2022–Present Reviewer for Nature Astronomy
- March 2022–Present Reviewer for ApJ
- December 2021 Swift GI Cycle 18 Leveler

Diversity, Equity, Inclusion, and Accessibility Activities

- July 2022–Present Mentoring post-bac researcher Jose Arita-Escalante in computational astrophysics research and career development

- 2016–2021 Led the OSU Astronomy Club where I organized activities which allowed more students from diverse backgrounds gain exposure to the field of astrophysics
- Organized talks to expose students to various topics in astrophysics including planetary science and general relativity
 - Organized connecting students to internship and research opportunities to enhance their chance of attending graduate school

Outreach Activities

- 2016–2020 Hosted Astronomy Open House Outreach events to interactively engage the public in astrophysical concepts
- Events brought in a few hundred participants of all ages
 - Collaborated with local organizations such as the astronomy club and library to ensure that this event caters to all
 - Created interactive outreach activities based on outreach training that I had received as a graduate student

Additional Skills

- FITS Format
- Matlab
- L^AT_EX
- MPI
- Software Development
- Bash
- Python
- OpenMP
- Heasoft Tools
- C
- Java
- Linux OS