

OLIVIA YOUNG

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EDUCATION

Rochester Institute of Technology

Masters in Astrophysics

PhD in Astrophysics

Projected Graduation Date - August 2022

Projected Graduation Date - May 2025

West Virginia University

Bachelor of Science in Physics

Minor in Mathematics

May 2020

RESEARCH EXPERIENCE

CLEAN Deconvolution of Pulsar Data

Fall 2020

Advisor: Dr. Michael Lam

Rochester Institute of Technology

- Using the CLEAN method outlined in Bhat et. al. 2003 to recover both the intrinsic pulse shape and pulse broadening function of pulsar radio emission as it travels through the ISM.

Ranking Pulsar Plots using Coherence Measures

Summer 2020

Advisor: Dr. Andrew Seymour

The Green Bank Observatory

- Summer internship with GBO funded through NANOGrav.
- Working to develop a statistical approach to ranking Presto pulsar detection plots.

Data Simulation to Constrain Fast Radio Burst Periodicity Search Techniques (Senior Thesis Project)

Fall 2019

Advisor: Dr. Maura McLaughlin and Dr. Duncan Lorimer

WVU

- Taken the lead on a project to evaluate the sensitivity of various periodicity search techniques in an effort to provide constants for repeating Fast Radio Bursts (FRBs).

Probing Binarity and Accretion in AGB Stars

Summer 2019

Advisor: Dr. Raghvendra Sahai

NASA's Jet Propulsion Laboratory

- Used the simulation software CLOUDY to build models of the ultraviolet chromospheric emissions from Asymptotic Giant Branch (AGB) stars in an attempt to detect binary interactions.
- Created python code to process optical light curves from AGB stars to search for "flickering" as possible indicators of binary activity.

Fast Extragalactic Transient Candidate Hunter (FETCH) Projects

Spring 2019 -Present

Advisor: Dr. Maura McLaughlin

WVU

- Exploring possible connections between short Gamma-Ray Burst remnants and Fast Radio Bursts with applications in machine learning.
- Confirming non-detection of FRBs from Long Gamma Ray bursts using the deep learning algorithm FETCH (<https://github.com/devanshkv/fetch>).
- Probing radio-bright sources for single pulses using FETCH. Collaboration with Dr. Fronefield Crawford of Franklin & Marshall College.

Pulsar and FRB Data Analysis with the 20m GBO Telescope

September 2018 - April 2019

Advisor: Dr. Maura McLaughlin

WVU

- Project funded by the WVU NASA Space Grant Consortium.

- Processing and evaluation of pulsar data to ensure the integrity of incoming pipeline data through pulse analysis.

The Swinburne Encyclopedia of Radio Pulsars (SERPs)

Summer 2018

Advisor: Dr. Matthew Bailes

Swinburne University of Technology

- NANOGrav International Research Experience for Students (IRES) summer internship.
- Created and launched SERPs (<http://astronomy.swin.edu.au/~oyoung/SERPS/>).

Pulsar Searching in the 2013-17 Arecibo Drift Scan

September 2017 -Present

Advisor: Dr. Maura McLaughlin

WVU

- Plot evaluation in an effort to discover new pulsars.

REFEREED PUBLICATIONS

1. Andrew Seymour, **Olivia Young** Ranking Pulsar Plots using Coherence Measures. In prep.
2. Golnoosh Golpayegani, Duncan R. Lorimer, Steven W. Ellingson, Devansh Agarwal, **Olivia Young**, Frank Ghigo, Richard Prestage, Kaustubh Rajwade, Maura A. McLaughlin, Michael Mingyar. GBTrans: A commensal search for radio pulses with the Green Bank twenty metre telescope. *Monthly Notices of the Royal Astronomical Society*, arXiv:1905.00980, Nov. 2019.
3. D. R. Madison, D. Agarwal, K. Aggarwal, **O. Young**, H. T. Cromartie, M. T. Lam, S. Chatterjee, J. M. Cordes, N. Garver-Daniels, D. R. Lorimer, R. S. Lynch, M. A. McLaughlin, S. M. Ransom, and R. S. Wharton. A Deep Targeted Search for Fast Radio Bursts from the Sites of Low-Redshift Short Gamma-Ray Bursts. *The Astronomical Journal*, arXiv:1909.11682, Sept. 2019.
4. Yunpeng Men, Kshitij Aggarwal, Ye Li, Divya Palaniswamy, Sarah Burke-Spolaor, K. J. Lee, Rui Luo, Paul Demorest, Shriharsh Tendulkar, Devansh Agarwal, **Olivia Young**, and Bing Zhang. Non-detection of fast radio bursts from six gamma-ray burst remnants with possible magnetar engines. *Monthly Notices of the Royal Astronomical Society*, arXiv:1908.10222, Aug. 2019.

NON REFEREED PUBLICATIONS

1. Crawford, Fronefield and Margeson, James and Nguyen, Benjamin and Saigal, Tanya and **Young, Olivia** and Agarwal, Devansh and Aggarwal, Kshitij. Reprocessing of a Green Bank 43 m Telescope Survey of Unidentified Bright Radio Sources for Pulsars and Radio Bursts. *Research Notes of the AAS*. arXiv:2102.01132, Feb. 2021.

PROPOSALS

1. *Observations of Pulsar J0030+0451 using the LWA1*, Cycle 10 Proposal Call for the Long Wavelength Array. Proposal Accepted.
1. *Real-time FPGA and GPU Algorithm for Transient Hunting on the Long Wavelength Array*, NSF Graduate Research Fellowship Program (GRFP). Results Pending.

SKILLS

Computer Languages

Bash, Python, C, Java, MatLab

Software & Tools

CLOUDY, PRESTO, HTML, LaTeX, PHP, JAVAScript, GitHub, GitLab

Skills & Training

GBT observer training, soldering, welding (MIG and Stick)

GRANTS AND AWARDS

AST/NY Space Grant Junior Fellowship

RIT

2020 - 2021

Fellowship funded by the New York Space Grant for the Spring semester.

Outstanding Graduating Senior Award

WVU

2020

Named outstanding senior of the graduating class of 2020 from the WVU Department of Physics and Astronomy.

NASA Space Grant Consortium Undergraduate Fellowship

WVU

2018-2019

NASA Fellowship and scholarship to aid in research projects.

Edmund A. and Rose C. Rotter Endowed Scholarship

WVU

2018-2019

Awarded departmental scholarship.

CPHYS Computational Physics Scholarship

WVU

2018-2019

Scholarship awarded for participating in computational physics research.

POSITIONS OF RESPONSIBILITY

Admittance Committee Graduate Member

2022

Graduate Student Representative

RIT

- Reviewed applications to the Astrophysics PhD program and made admittance recommendations.

Conference for Undergraduate Women in Astronomy

2019

Co-founder, lead organizer, and Undergraduate Chair

WVU

- Wrote funding and grant proposals for conference and reached out to sponsors, helping to secure \$15,000 worth of funding.
- Contacted and booked plenary speakers, including keynote speaker Dame Jocelyn Bell Burnell, panelists, and workshops.
- Created and launched conference website (<https://sites.google.com/view/cuwia/home>) and designed promotional media, along with exit survey.
- Lead the formation of the first Conference for Undergraduate Women in Astronomy, reaching 60 students from 21 different universities across ten states.

NANOGrav Fall Meeting

2019

SOC Member

- Helped with presentations and organization focused on undergraduate participation at the NANOGrav Cornell Fall Meeting.

Society of Physics Students

2017-May 2020

Chapter President, Senior Advisor, and Member

WVU

- Organized the visit of the first undergraduate-hosted colloquium speaker, Dr. David Atkinson of JPL, in collaboration with the WVU NASA Space Grant.
- Launched the SPS Journal Club to encourage undergraduate participation in research at WVU.
- Hosted speakers on topics such as internships, scholarships, and mental health.
- As Senior Advisor, helping underclassmen with fellowship applications, writing resumes, and introduction to coding in Python.
- Awarded title Of Distinguished Chapter by the national SPS.

NASA Science Public Outreach Team (SPOT)

Fall 2019- May 2020

President

WVU

- Lead biweekly meetings of the WVU group of SPOT ambassadors, conduct member recruitment, and help to certify new ambassadors in presentations.

Planetarium Employee

August 2018-May 2020

Telescope Operator

WVU

- Operate 14 inch optical telescope and educate the public about astronomy.

OUTREACH AND MENTOR POSITIONS

NASA Science Public Outreach Team (SPOT)

September 2017- May 2020

President and Ambassador

WVU

- Personally reached 1,239 school children across the state of West Virginia with presentations and hands-on activities through classroom visits, STEM festivals, and science fairs. This includes the presenting of the NANOGrav SPOT presentation as well.

Pulsar Search Collabratory

Sept 2017- Present

Mentor

WVU

- Outreach to high school students which involves both introducing Pulsar Astronomy and helping them learn to search for pulsars through classroom visits, forum participation, and capstone events.

Mapping the Milky Way Project

2019

Mentor

WVU

- Outreach to teach high school students how to identify, take, and analyze data on star forming regions in the Milky Way.

Energy Express Mentor

Summer 2017

*Classroom teacher**West Virginia Public Schools*

- Mentored in a reading program for under-privileged youth in West Virginia with topics focusing on logical reasoning, astronomy, community building, and science.

PRESENTATIONS

Invited Talks

1. West Virginia University Undergraduate Research Opportunities
 - Potomac State College Undergraduate Research Night, December 4, 2019

Oral Presentations

1. Pulsar and Fast Radio Burst Searching with the 20m Telescope at Green Bank Observatory
 - 2019 Mid-Atlantic Undergraduate Research Conference (Virginia Tech)
2. Probing Binarity and Accretion in AGB Stars: Analysis of GALEX and TESS Data
 - 2019 JPL end of internship oral presentation
 - Fall 2019 WVU Department Undergraduate Colloquium
3. Data Simulation to Constrain Fast Radio Burst Periodicity Search Techniques
 - 2020 NANOSTARS meeting

- 2020 West Virginia Undergraduate Research Symposium
4. Ranking Pulsar Plots using Coherence Measures
 - End of semester research talks with RIT
 - 2020 GBO end of internship presentation

Poster Presentations

1. Pulsar Searching in the 2011-2014 Arecibo Drift Scan
 - 2018 Undergraduate Research Day at the Capitol (WV State Capitol)
 - 2018 West Virginia Undergraduate Research Symposium
 - 2018 NANOGrav site visit to WVU
2. The Swinburne Encyclopedia of Radio Pulsars (SERPs)
 - 2018 NSF site visit to West Virginia University
 - 2018 APS Conference for Undergraduate Women in Physics (College of William and Mary)
3. Pulsar and Fast Radio Burst Searching with the 20m Telescope at Green Bank Observatory
 - 2019 Undergraduate Research Day at the Capitol (WV State Capitol)
 - 2019 Mid-Atlantic Undergraduate Research Conference (Virginia Tech)
4. Exploring Possible Connections Between Short Gamma-Ray Burst Remnants and Fast Radio Bursts with Applications in Machine Learning
 - 2019 3rd Annual WVU Undergraduate Spring Research Symposium
 - 2019 NANOGrav NSF site visit at the University of Wisconsin, Milwaukee
5. Data Simulation to Constrain Fast Radio Burst Periodicity Search Techniques
 - 235th Meeting of the AAS
6. Ranking Pulsar Plots using Coherence Measures
 - 237th Meeting of the AAS