

# Alexander Johnson

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## Education

PhD, Physics, Washington State University expected 2027

- GPA 3.89

B.S., Physics, Pacific Lutheran University, Tacoma WA June 2021

- Hispanic Studies Minor
- GPA 3.90
- Dean's List, 7 semesters
- PLU International Honors program

## International Education

- Oxford, United Kingdom Spring 2020
  - Individual tutorials with Oxford University faculty
- Montevideo, Uruguay January 2018
  - Spanish language immersion program

## Research Experience

Graduate Research Assistant, Department of Physics and Astronomy, Washington State University

May-August 2023, May 2024-Current

- 2023, with Dr. Phil Marston: helicoidal acoustic beam wave-scattering simulation in Python, modeling acoustic stabilization of capillary bridge in Mathematica.
- 2024-Current, with Dr. Maria Charisi: Black hole binary detection, process, and analysis using multi-messenger astronomy, pulsar timing arrays, and time-domain astronomy. Trained on operation of the WSU Jewett Observatory.

Independent Study, Department of Physics, Pacific Lutheran University, Tacoma WA

September 2021-May 2022

- Computational Modeling for High Energy Physics
  - Created Python model of Sun structure and a timescale estimate for proton-proton chain fusion reactions in the solar core
  - Created Python algorithm to analyze FITS file inputs of solar surface, then detect, track, and model sun spots and their various characteristics over time

- General Relativity
  - Explored new models for spacetime boundary conditions, specifically looking into the potential trapping phenomena of small extra-dimensional spheres

Summer Student Research Assistantship, Green Bank Observatory, Green Bank WV

May-August 2020

Research Advisor: Dr. Will Armentrout

- Examined and analyzed data for observations of 12 HII regions in the Outer Scutum-Centaurus Arm of the Milky Way, which indicate zero-age massive star formation

## Publications and Presentations

Johnson, A., Armentrout, W. P., et al., 2021. "Detecting HII Regions in the Outer Scutum-Centaurus Arm"

Armentrout, W. P., et al. "Dense Gas in the Far Outer Galaxy" In prep

237<sup>th</sup> AAS winter conference, Poster Presentation January 2021

- Honorable Mention, Chambliss Astronomy Achievement Student Awards

University of Washington Undergraduate Research Symposium May 2021

Astrobiters Undergraduate Research Abstract June 2021

## Employment

**Graduate Research Assistant**, Department of Physics and Astronomy, Washington State University

May-August 2023, May 2024-Current

- 2023, with Dr. Phil Marston: helicoidal acoustic beam wave-scattering simulation in Python, modeling acoustic stabilization of capillary bridge in Mathematica.
- 2024-Current, with Dr. Maria Charisi: Black hole binary detection, process, and analysis using multi-messenger astronomy, pulsar timing arrays, and time-domain astronomy.

**Graduate Teaching Assistant**, Department of Physics and Astronomy, Washington State University

August 2022-Current

- Physics 201/211, 102/112
- Honors Physics 205/206

**Global Ambassador**, Wang Center for Global Education, Pacific Lutheran University  
August 2021-May 2022

**Homework Grader**, Department of Physics, Pacific Lutheran University  
September-December 2021

**Lab Teaching Assistant**, Department of Physics, Pacific Lutheran University  
September-December 2019

- Physics 153

## Service and Campus Involvement

Violinist, Washington Idaho Symphony	2022-
Violinist, Washington State University Symphony	2022-
Concertmaster, Pacific Lutheran University Symphony Orchestra	2017-2021
President, Pacific Lutheran University Physics Club	2018-2019
Eagle Scout, Senior Patrol Leader, Boy Scouts of America	2010-2017

## Skills

Introductory Java, Data Structures in Java

Python (including Astropy and APLpy)

Introductory Statistics with R

LaTeX

Intermediate fluency in Spanish