

Amanda L. Mashburn

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Education

Kennesaw State University — M.S. Mechanical Engineering | Marietta, GA

Jan. 2019 — Dec. 2020

Coursework:

4.0 GPA

ENGR 6120 - Applied Engineering Mathematics

ME 6210 - Advanced Manufacturing

ME 6220 - Advanced Solid Mechanics

ME 6230 - Advanced Engineering Thermodynamics

ME 6240 - Applied Engineering Design

ME 6250 - Advanced Dynamics and Vibrations

ME 6260 - Advanced Engineering Heat Transfer

ME 6270 - Advanced Fluid Mechanics and Computational Fluid Dynamics

University of West Georgia — B.S. Physics | Carrollton, GA

Aug. 2010 – April 2016

- President of the Physics and Engineering Club, 2012 — 2013
- Undergraduate Teaching Assistant for Physics and Astronomy Laboratory courses, 2010 — 2014
- Undergraduate Research Assistant in:
 - Photometry, 2010 — 2011
 - Science Education, 2013 — 2014
 - Astrophysics, 2013 — 2016
 - Computational Atomic Physics, 2015 — 2016
- West Georgia Regional Science and Engineering Fair Judge, 2011 — 2017

Relevant Coursework:

Astronomy ; Astrophysics; Basic Electronics; Calculus I, II, and III; Chemistry I and II;

Computational Physics; Electricity and Magnetism; Experimental Physics I and II;

Mathematical Physics; Mechanics; Modern Physics; Nuclear Physics; Optics;

Ordinary Differential Equations; Physics I and II; Physics Seminar; Quantum

Mechanics; Thermodynamics; Transition to Advanced Mathematics.

Experience

Laboratory Coordinator — University of West Georgia

Aug. 2017 — Present

- Teach curricula and deliver lectures for Physics laboratory courses for introductory physics with and without calculus.
- Write and edit lab manuals integrating physics concepts and the lab instructions for students to use in a laboratory setting.
- Train, mentor, and advise undergraduate teaching assistants for physics laboratory courses.
- Maintain lab safety and equipment.
- Instruct students in laboratory setup and operations.
- Assist students in understanding physics and astronomy concepts.
- Maintain and organize laboratory inventory and order new supplies.
- Grade students' lab reports and maintain records of students' progress.
- Courses taught:
 - PHYS-2211L Principles of Physics I Laboratory & Honors
 - PHYS-2212L Principles of Physics II Laboratory & Honors
 - PHYS-1111L Introductory Physics I Laboratory
 - PHYS-1112L Introductory Physics II Laboratory

Mechanical Engineering Intern — UNIQ Technologies, Inc. Airwyse Divison

May 2019 — July 2019

General Responsibilities:

- Assisted the Airwyse drone engineering team in developing the drone's several subsystems, with focus in scouting, image recognition, image categorization and standard referencing, including spectral analysis.
- Actively participated in drone field testing, including performing pre-flight checks, post-flight checks, field test result analysis, and other tasks as needed.
- Actively engaged and contribute in engineering reviews and discussions.
- Worked closely with business/ engineering team to meet project deadlines.
- Provided weekly progress updates and plans for following week.
- Managed daily schedule, working independently and with teams as the project requires.
- Built solid foundational visual imaging materials for sharing & featuring on Airwyse Website.

Specific Responsibilities:

- Assessed feasibility of different scientific methods and image processing techniques (i.e. spectroscopy, remote sensing, computer vision, machine learning) to analyze and determine a variety of agricultural properties and information.
- Became a subject-matter expert in spectroscopy (visible and near-infrared), remote sensing (RGB, multispectral, and hyperspectral imaging), computer vision, machine learning.
- Conducted scientific literature searches to identify relevant information pertaining to the topics under study.
- Gathered, organized, and documented information necessary to support business plans.
- Prepared and Wrote Project Proposals for scientific experiments and processes.
- Created business strategies to implement.
- Networked and Established contacts with industry and academic experts.
- Operated and Troubleshooted Multispectral Camera (RedEdge 3) for UAV usage.
- Calibrated and Processed multispectral images from geospatial remote sensing data.
- Analyzed multispectral images and apply vegetation and spectral indices.

Lead Observing Assistant — University of West Georgia Observatory

Aug. 2010 — Present

- Lead and assist with student observations and public outreach events.
- Previous public outreach events: 2012 Venus Transit, lunar eclipses, 2015 Comet Lovejoy viewing, and 2016 Mercury Transit.
- Train and supervise other observing assistants on telescope operations.
- Troubleshoot and maintain telescopes (manual and computerized) as well as other telescope and optical equipment.
- Presented the success of the Venus Transit event at the Georgia Academy of Sciences 2013 Meeting.

Assistant Laboratory Coordinator — University of West Georgia

Aug. 2016 — July 2017

- Taught curricula and delivered lectures for Physics laboratory courses for introductory physics with and without calculus.
- Taught curricula and delivered lectures for Astronomy laboratory courses for non-majors.
- Trained, mentored, and advised undergraduate teaching assistants for physics and astronomy laboratory courses.
- Maintained lab safety and equipment.

- Instructed students in laboratory setup and operations.
- Assisted students in understanding physics and astronomy concepts.
- Graded students' lab reports and maintained records of students' progress.
- Courses taught:
 - ASTR-2313L Astronomy Laboratory
 - PHYS-2211L Principles of Physics I Laboratory
 - PHYS-2212L Principles of Physics II Laboratory
 - PHYS-1111L Introductory Physics I Laboratory
 - PHYS-1112L Introductory Physics II Laboratory

Research Assistant: Astrophysics and Atomic Physics — Univ. of West Georgia

- Provided an analysis of observational and experimental data in Astrophysics and Atomic Physics.
- Expanded the atomic database for nebular and stellar neutron-capture element abundance determinations.
- Provided an analysis of experimental atomic data to determine photoionization and recombination properties of low-charge bromine and rubidium ions.
- Used IDL for astronomical data reduction to measure line fluxes and intensities in optical and near-IR spectra.
- Wrote scripts in Python and IDL to compute temperatures, densities, and elemental abundances of 15 galactic and 9 extragalactic planetary nebulae.
- Assisted with writing papers for publication for the Astrophysical Journal.
- Mentored and advised fellow research assistants.
- Participated in a week-long observing run at McDonald Observatory, Fort Davis, TX operating with the 2.7m telescope.
- Research and results were presented at the following:
 - American Astronomical Society Winter Meeting #225 2015
 - American Astronomical Society Winter Meeting #227 2016
 - Invited to speak at UWG Leadership Development Institute Retreat, May 2015
 - UWG College of Science and Math Research Day 2016
Received Award: 1st Place Presentation
 - UWG's "Big Night" 2016

Aug. 2013 — July 2016

Teaching Assistant: Physics and Astronomy

Aug. 2010 — Dec. 2014

- Taught curricula and delivered lectures for Astronomy and Physics laboratory courses for introductory physics with and without calculus.
- Maintained lab safety and equipment.
- Instructed students in laboratory setup.
- Assisted students in understanding physics and astronomy concepts.
- Graded students' lab reports and maintained records of students' progress.

Research Assistant: Science Education — University of West Georgia

May 2013 — April 2014

- Designed a laboratory experiment for introductory astronomy and physics students to understand the concept of parallax.
- Experiment and results were presented at the following conferences:
 - Georgia Academy of Sciences 2014 Meeting
Received Award: Best Oral Presentation in Science Education
 - American Association of Physics Teachers 2014 Winter Meeting

Research Assistant: Photometry — University of West Georgia

Aug. 2010 — Oct. 2011

- Observed at the UWG Observatory to collect observational data on Delta Scuti (variable) stars using a charge-coupled device (CCD).
- Reduced and analyzed photometric data using MaxIm DL to construct light curves.
- Presented the light curves of observed Delta Scuti stars at the National Collegiate Honors Council 2011 Conference.

Physics Lab Instructor — Univ. of West Georgia's UWISE Summer Bridge Program

Aug. 2011

- Taught and delivered lectures for physics laboratory concepts for the UWISE Summer Bridge Program to prepare incoming freshmen going into STEM fields.
- Maintained lab safety and equipment.
- Instructed students in laboratory setup.
- Mentored and advised incoming STEM students.

Certifications

- Laboratory Safety Short Course
Aug. 2017 – Laboratory Safety Institute

Awards

- Above and Beyond 2017 Award in Risk Management
Dec. 2017 – Univ. Of West Georgia
- College of Science and Mathematics Research Day: 1st Place
April 2016 - Univ. of West Georgia's College of Science and Mathematics
- Outstanding Oral Presentation in Science Education
March 2014 - Georgia Academy of Sciences

Professional Memberships

- Georgia Women in Physics, Sept. 2018 — Present
- American Astronomical Society (AAS), Sept. 2014 — Present
- American Association of Physics Teachers (AAPT), May 2013 — Present
- Georgia Academy of Sciences (GAS), March 2012 — Present

Oral Presentations

- *(Guest Lecturer)* **The Evolution of Stars**
ASTR 2313: Astronomy | Instructor: Dr. Nicholas Sterling | Univ. of West Georgia
April 2018 – Prepared and delivered a lecture to ~110 undergraduates on the life cycles of stars
- **Heavy Element Abundances in Planetary Nebulae from Deep Optical Echelle Spectroscopy**
April 2016 - University of West Georgia's "Big Night"
- **Heavy Element Abundances in Planetary Nebulae from Deep Optical Echelle Spectroscopy**
April 2016 - College of Science and Mathematics Research Day Competition
- *(Invited)* **The Detection of Neutron-Capture Elements in Magellanic Cloud Planetary Nebulae**
May 2015 - Leadership Development Institute Retreat at Univ. of West Georgia
- **Parallax: A Lab for Introductory Astronomy Students**
March 2014 - Georgia Academy of Sciences 2014 Meeting
- **Transit of Venus, June 2012**
March 2013 - Georgia Academy of Sciences 2013 Meeting

Poster Presentations

- **Heavy Element Abundances in Planetary Nebulae from Deep Optical Echelle Spectroscopy**
Jan. 2016 - American Astronomical Society Meeting #227
- **The Detection of Neutron-Capture Elements in Magellanic Cloud Planetary Nebulae**
Jan. 2015 - American Astronomical Society Meeting #225
- **Parallax Lab for Introductory Astronomy Students**
Jan. 2014 - American Association of Physics Teachers 2014 Winter Meeting
- **Light Curves of Delta Scuti Stars**
Oct. 2011 - National Collegiate Honors Council Conference

Publications

4. *Atomic data for neutron-capture elements. IV. Photoionization and recombination properties of low-charge bromine and rubidium ions*
Kerlin, A. B.; Sterling, N. C.; **Mashburn, A. L.**; Harrison, J. E.
In Preparation 2020, *Astronomy & Astrophysics*.
3. *Neutron-capture element abundances in the planetary nebula NGC 5315 from deep optical and near-infrared spectrophotometry*
Madonna, S.; García-Rojas, J.; Sterling, N. C.; Delgado-Inglada, G.; Mesa-Delgado, A.; Luridiana, V.; Roederer, I. U.; **Mashburn, A. L.**
Oct. 2017, *Monthly Notices of the Royal Astronomical Society*, Volume 471, Issue 2, p.1341-1369.
arXiv:[1706.07225](https://arxiv.org/abs/1706.07225)
2. *Identification of Near-Infrared [Se III] and [Kr VI] Emission Lines in Planetary Nebulae*
Sterling, N. C.; Madonna, S.; Butler, K.; García-Rojas, J.; **Mashburn, A. L.**; Morisset, C.; Luridiana, V.; Roederer, I. U.
May 2017, *The Astrophysical Journal*, Volume 840, Issue 2, article id. 80, 8 pp. (2017).
arXiv:[1704.00741](https://arxiv.org/abs/1704.00741)
1. *Neutron-capture Element Abundances in Magellanic Cloud Planetary Nebulae*
Mashburn, A. L.; Sterling, N. C.; Madonna, S.; Dinerstein, Harriet L.; Roederer, I. U.; Geballe, T. R.
Nov. 2016, *The Astrophysical Journal Letters*, Volume 831, Issue 1, article id. L3, 7 pp. (2016).
arXiv:[1610.03072](https://arxiv.org/abs/1610.03072)

Poster Publications

3. *Abundance Analysis of 17 Planetary Nebulae from High-Resolution Optical Spectroscopy*
Sherrard, Cameroun G.; Sterling, Nicholas C.; Dinerstein, Harriet L.; Madonna, Simone;
Mashburn, Amanda
June 2017, American Astronomical Society, AAS Meeting #230, id.318.11

2. *Heavy Element Abundances in Planetary Nebulae from Deep Optical Echelle Spectroscopy*
Mashburn, Amanda; Sterling, Nicholas C.; Dinerstein, Harriet L.; Garofali, Kristen; Jensema, Rachael; Turbyfill, Amanda; Wieser, Hannah-Marie N.; Reed, Evan C.; Redfield, Seth
Jan. 2016, American Astronomical Society, AAS Meeting #227, id.238.04

1. *The Detection of Neutron-Capture Elements in Magellanic Cloud Planetary Nebulae*
Mashburn, Amanda; Sterling, N. C.; Roederer, I. U.
Jan. 2015, American Astronomical Society, AAS Meeting #225, id.140.49