Caroline Howell

927 W 102nd Ave
Northglenn, CO 80260
(850) 447-0812
wpcaroline@gmail.com

EDUCATION

Liberty University Online
Attended 2024- present
Degree: Ph.D. in Psychology with a focus in Theology, Overall GPA: 4.0/4.0
Credits Completed at Institution: 18 hours
Diploma Expected December 2027

Notable Classes: Research Methods and Statistics I and II, Systematic Theology I and II, Public Theology, Psychological Research and Biblical Worldview

---

University of Colorado Boulder, Boulder, CO
Attended 2021-2023
Degree: Masters in Materials Science and Engineering, Overall GPA: 3.6/4.0
Credits Completed at Institution: 31 hours
Diploma Received May 2023

Notable Classes: Software Engineering for Scientists (Python), Bioinformatics and Genomics, Fundamentals of Materials Science, Materials Composition and Structure, Neuroscience, Bio-inspired Multi-agent Systems, Materials Characterization, Thermodynamics and Kinetics

---

Troy University, Troy, AL
Attended 2017-2021
Major: Physics and Mathematics, Overall GPA: 3.8/4.0
Credits Completed at Institution: 102 hours
Diploma Received May 2021

Notable Classes: Computer Science (C++), Linear Algebra, Physics I and II with Calculus, Vector Calculus, Real Analysis I and II, Waves and Optics, Organic Chemistry, Modern Physics, Numerical Analysis, Mechanics I and II, Electricity and Magnetism I and II, College Geometry, Numerical Analysis, Abstract Algebra, Thermodynamics, Quantum Physics, Relativity, Astronomy, Biology, Psychology, World Religions

Study Abroad Experience in Italy: https://today.troy.edu/news/study-abroad-trip-targets-contributions-of-italian-mathematicians-scientists/

Chipola College, Marianna, FL
Attended 2014-2017
Dual Enrollment
Intended Major: Physics, Overall GPA: 4.0/4.0
Credits Completed at Institution: 65 hours

Notable Classes: Trigonometry, General Chemistry I and II, Calculus I, II, and III, Differential Equations, Technical Writing, Statistics

---

Blountstown High School, Blountstown, FL
Attended 2013-2017
Diploma Received May 2017

WORK EXPERIENCE

Research Scientist RockyTech August 2023-present

- Key responsibilities: Team member and a leader of the Polyolefin Upcycling project (Lab training, Meeting updates, SOPs, etc.), Research and Development, Community Outreach, Graphic Design Experience, Social Media Marketing, and Expo liaison.
- Contact(s): Dr. Alice Yinghua Jin, Dr. Kyle Chin, Athena Jin, Dr. Louis Concoran, Amogh Gupta
- Website: www.rockytechs.com
- Notable Contributions:
    - Helped make the masterbatch process 32x more efficient
    - Sole operator of the extruder and injection molder- even having it named after me ("Caroline's extruder")
    - Assisted in the company's move by transporting and setting up equipment (lab equipment including fume hoods, machines, etc., lab supplies, desks, chairs)
    - Created all materials (banners, flyers, signs, samples, etc.) for the company's first expo showcase
    - Wrote weekly reports and quarterly reports that updated the company on all research and development on the project
    - Assisted in securing grants that funded the company by creating PIER plans and supplying the data for the project
    - Produced a high output from my research and development efforts, moving the project along effectively
    - Crafted social media posts that helped the company gain 3x the amount of followers on LinkedIn
    - Wrote SOPs and detailed notes on how to operate the machines
    - Trained multiple interns and new hires on the machines in the lab
    - Assisted in quality management of materials by helping streamline the process of producing our main products, making them stable and re-produceable (i.e. helped created the minimum viable products (MVPs) for RockyTech that became RockyTech's first sales/revenue)
    - Helped scale-up RockyTech's MVPs from lab scale to production scale
    - Represented RockyTech at multiple outreach events, conferences, and expos

Teaching Assistant CU Boulder January-May 2023

- Taught multiple (3) introductory biology labs for the Ecology and Evolutionary Biology department at CU Boulder in the Spring semester by writing and grading assignments, preparing lecture material, and conducting labs.
- Contact(s): Dr. John Basey

Spark Driver Walmart Independent Contractor 2022-2023

- I managed multiple grocery or package deliveries efficiently, adapted to traffic and route changes, and provided a positive customer experience.

Assistant Calhoun-Liberty Abstract Office January- May 2022

- Helped organize documents, answer calls, and write deeds.
- Contact(s): Ray Howell

Research Assistant CU Boulder August 2021- December 2022

- Aided in research in multiple labs regarding biomaterials, mechanical engineering, and psychology. Completed a report and presentation regarding the research completed. I learned skills in cell culture, image analysis, surveying, research etiquette, adhering to IRB protocol, EKG readings, and literature review.
- Contact(s): Dr. Virginia Ferguson, Dr. Stephanie Bryant, Dr. Angela Bryan, Dr. Erik Knight

Dasher Doordash Independent Contractor 2021-2023

- I managed multiple food or catering deliveries efficiently, adapted to traffic and route changes, and provided a positive customer experience.

Tutor Pike County School District August 2020- May 2021

- Tutored/taught high school kids taking college classes in various subjects.
- Contact(s): Jeff McClure

Workship (Math Tutor/Aid) Troy University Math Department August 2020- May 2021

- Tutored college students in various advanced math classes as well as helped out the department/faculty with tasks.
- Contact(s): Dr. Ken Roblee, Lillian Sullivan

Research Experience for Undergraduates (REU) Student May- August 2020
Vanderbilt University, online

- Worked on and aided in a research project named Measuring Spatiotemporal Characteristics of Calcium Flares around Laser-Induced Epithelial Wounds. I learned how to code and debug code in Mathematica, how to analyze images with Image J, and how to write reports and presentations.
- Contact(s): Dr. Shane Hutson, Dr. Aaron Stevens

Chegg Tutor February 2020-May 2020

- Tutored on an online platform for math and science.

REU Student June-August 2019
Georgia Institute of Technology, Atlanta, GA

- Worked on and aided in a research project named Strain Localization During Slow Strain Rate Testing of Sensitized Al-Mg Alloys. I learned tensile testing, sample preparation, report writing, and presentation skills.
- Contact(s): Dr. Josh Kacher, Dr. Jordan Key

Math Tutor September 2014- May 2016
Blountstown High School, Blountstown, FL

- Reviewed math skills, aided with homework assignments, prepared for the FLA Math Assessment

RESEARCH EXPERIENCE

Redefining Recycling with PE/PP REVLINK Compatibilizer 2023-2025

(Duration: 1.5 years)

RockyTech, Boulder, CO

- Research Advisor: Dr. Yinghua (Alice) Jin and Dr. Kyle Chin
- Skills: Tensile testing, rheology, MFI testing, extrusion, injection molding, data analysis, graphic design, sales experience, working with high temperatures, troubleshooting machinery, operating machinery, writing SOPs, experimental design, report writing, optimizing efficiency of processes, scale-up processes
- Presented:
    - ACS 2024 in Denver, Colorado
    - AMI Plastics World Expo 2023 in Cleveland, Ohio
    - PlastecWest Expo 2024 in Anaheim, California

Abstract: Polyethylene (PE) and Polypropylene (PP) are two of the most widely used plastics today, accounting for over 40% of global plastic consumption. During the recycling process, PE and PP often fail to be adequately separated due to their similar structures and densities. Recycling these plastics together leads to significant degradation and phase separation because the polymers themselves are inherently immiscible. In addition, recycled polymers have typically undergone considerable thermo-mechanical degradation during their lifetime by the combined effect of humidity, UV light, chemical oxidation, and other environmental factors. Therefore, when it comes to recycling PE/PP blends, there is a major challenge of the quality deficiency leading to a significant amount of plastic ending up in landfills and the environment.

RockyTech has developed a reactive compatibilizer known as REVLINK to tackle the challenges of recycling PE/PP blends. The key strategy involves incorporating reversible covalent bonds into polyolefin linear chains to enable their crosslinking at the particle interface to achieve polymer fusion. This innovative process enables upcycling of mixed polyolefins with enhanced properties, allowing for multiple recycling cycles without property degradation. With the addition of only 1 wt.% REVLINK into a PE/PP blend, it can significantly improve the performance, including 18% increase in flexural modulus, 200% increase in elongation at break, and possible reduction in melt flow index (MFI). Not only can REVLINK improve the recycling quality of mixed plastics, but it can also tune the properties of PE itself. Compared to pure PE, a blend of PE with 10% PP and REVLINK exhibits improved performance, including a 10% increase in flexural modulus, a 40% increase in elongation at break, and a 23% increase in tensile strength. REVLINK is a novel innovation with the goal of creating a more circular economy by turning plastic waste into a sustainable product.

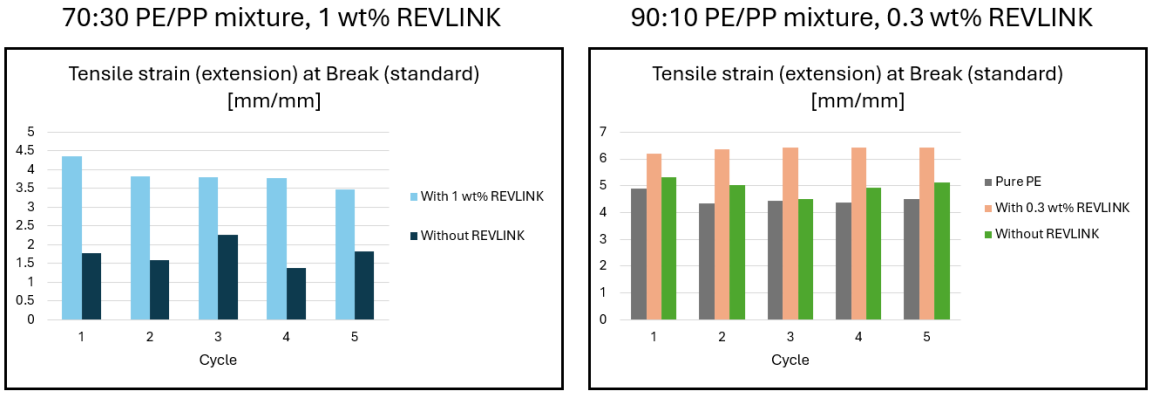

Figure 1: Tensile properties of PE and PP mixtures with and without compatibilization: A significant improvement in elongation at break was observed with the addition of 0.3-1 wt.% REVLINK without compromising or even improving other tensile and flexural properties over five consecutive extrusion and injection molding cycles.

Mapping Sound Waves in Octave 2018-2021 (Duration: 4 years)

Troy University, Troy, AL

- Research Advisor: Dr. James Sanders
- Research Collaborators: Victoria Colvin, Soumitra Ganguly, Sebastian Lee, Suraj Thapa Magar, Nick Johnson
- Submitted for publication and review in The Physics Teacher Journal 5/29/2020
- Accepted for publication in The Physics Teacher Journal 7/25/2022
- Published in The Physics Teacher Journal 5/1/2023: https://doi.org/10.1119/5.0082472
- Presented:
    - 2018 PME Math Conference in Denver, Colorado, 2019
        - Received a student speaker award
    - Alabama Academy of Science Conference at Tuskegee University
        - Received 2nd place in physics section of presentations
    - 2019 CUWiP at University of Alabama
        - Received an honorable mention
    - 2019 Troy University MathFest in Troy, AL
    - 2019 Troy University Student Research Conference in Troy, AL
- Skills: Coding, simulation building, writing, presenting

Abstract: The intensity of a sound wave emitted from a point source in an isotropic and reflectionless region of space will decrease by the square of the distance from the source. However, if boundaries are introduced, then the reflected waves can interfere with each other and with the incident wave. Therefore, sound waves emitted from a source in an enclosed room will have an intensity which follows the inverse square law for short propagation distances, but deviates as incident and reflected waves of comparable amplitudes interfere with each other. This project makes use of the MATLAB clone GNU OCTAVE to calculate the intensity of a sound

wave as a function of distance from a source which is placed in an enclosed room. This calculation considers multiple possible paths along which a wavelet can propagate along to reach the detector: a direct path, 6 paths containing one reflection each, and 30 paths containing two reflections each. It then determines the relative amplitude and phase for each of these paths in order to create a superposition of these 37 wavelets at the position of the detector. Squaring this superposition wave's amplitude yields the sound intensity at the location of the detector.

Angle Scans of Scattered Light Intensity 2020 (Duration: 7 months)

Troy University, Troy, AL

- Research Advisor: Dr. James Sanders
- Research Collaborators: Nick Johnson
- Presented:
    - 2020 Student Research Colloquium in Troy, AL

Abstract: The intensity of scattered light from water droplets in steam changes when viewed from different angles. In this project, a laser is incident upon steam produced by boiling water, and it is scattered at different angles. The scattered light is then captured by a camera and analyzed in a computer program, OCTAVE. The intensity of the scattered light is dependent on the scattering angle, with the intensity decreasing as the angle approaches 90 degrees from above or below. This effect can be explained by Mie Scattering. Mie Scattering is the scattering of electromagnetic waves by uniform isotropic particles. The water droplets in the steam absorbs and scatters the laser and transforms the energy into different forms accounting for the low intensity at 90 degrees. This project maps the intensity of the light in OCTAVE by analyzing the pictures from different radial and polar angles.

Measuring Spatiotemporal Characteristics of Calcium Flares around Laser-Induced Epithelial Wounds 2020 (Duration: 5 months)

Vanderbilt University, online

- Research Advisors: Dr. Shane Hutson and Aaron Stevens
- Skills: Coding, revising and troubleshooting scripts, data analysis, writing reports and presentations
- Sponsored by NSF grant 1852158 and NIH grant 1R01GM130130 and Vanderbilt University
- Presented:
    - 2020 Vanderbilt REU Remote Convocation
    - 2020 SPS Research Colloquium in Troy, AL
    - 2021 Troy University MathFest in Troy, AL

Abstract: Epithelial cells are important in the makeup of many organisms and serve as a barrier which wounds can disrupt. When epithelial cells are wounded, they must signal the presence of the wound to nearby cells in order to begin healing the damages. The first observed signal upon wounding is an influx of calcium into both damaged cells near the wound as well as undamaged cells farther from the wound. This calcium signaling process has been shown to arise from

different physical, biological, and chemical mechanisms that produce distinct calcium signaling stages. The last stage which involves complex calcium oscillations and calcium waves that propagate across the wounded tissue is called flaring, and its purpose is still rather unknown. A program was previously developed in Mathematica to measure various spatiotemporal characteristics of calcium flares around laser-induced epithelial wounds in fruit fly pupae. The code measures characteristics such as the duration and frequency of calcium flares. This project utilizes and expands on the program to measure other flare characteristics such as the speed at which they propagate and the spatial distance they coordinate over. This analysis is used to help build a computational model and is hoped to be able to understand more about flaring and its purpose in the wound healing process.

Strain Localization During Slow Strain Rate Testing of Sensitized Al-Mg Alloys 2019 (Duration: 10 weeks)

Georgia Institute of Technology, Atlanta, GA

- Research Advisor: Dr. Josh Kacher and Jordan Key
- Skills: tensile testing, 3D printing, data analysis, experimental design, writing reports and presentations
- SUIN REU sponsored by NSF grant EEC-1757579 and NNCI
- Presented:
    - 2019 NNCI REU Convocation at Cornell University, NY
    - 2020 CUWiP at University of Oklahoma

Abstract: Aluminum is a desired commodity for building vehicles, electronics, or other miscellaneous things. However, pure aluminum is soft and not as durable as needed for certain objects such as ships. Therefore, Aluminum-Magnesium alloys were introduced as a solution. These alloys help keep the lightweight features of aluminum while increasing strength, formability, and weldability. Yet, the magnesium segregation can lead to localized corrosion and stress corrosion cracking. This research is primarily focused on applications of Al-Mg alloys in saltwater environments, such as Navy ships, which are built using Al 5xxx alloys. This project investigated 20 samples of Aluminum 5456 that were broken into four subgroups which underwent different conditions to simulate the everyday stress and strain of a ship. The different conditions tested include sensitization, salt corrosion, and sensitization-salt corrosion. After enduring these conditions, the samples underwent a slow strain tensile test to further simulate the rough life of a ship. These tensile tests used a slow strain rate to ensure the observance of hydrogen embrittlement and stress corrosion cracking during the failure of the alloy. After failure, the samples' fracture surface was observed under the scanning electron microscope (SEM) to examine the strain effects on the metal. Aluminum alloys seem to experience brittle failure more often than ductile failure after exposure to nautical conditions, which is more catastrophic. Understanding the different fractures and cracks of the grain boundaries can help lead to the design of better materials that are more resistant to brittle failure and reduce the precipitation of magnesium.

Interdisciplinary Biology Program (Graduate School) Rotation Projects

- All projects had a duration of 8 weeks with requirements of a presentation and abstract.

Improving Segmentation Analysis of Cortical and Trabecular Bone Microarchitecture in Dragonfly Pro 2021 (Duration: 8 weeks)

- Research Advisor/Collaborators: Dr. Virginia Ferguson, Iain Morgan, and Jennifer Coulombe

Abstract: Declining levels of estrogen have been associated with osteoporosis, a debilitating disease that affects one out of two women over 50. Recently, Follicle Stimulating Hormone (FSH) has been shown to serve as a better biomarker for bone formation and resorption than estrogen. To investigate how FSH affects bone microstructure, it is important to develop a repeatable and facile image processing methodology. Classically, bone microstructure has been evaluated through micro-computed tomography (microCT) in which bone segmentation is a critical step. Bone segmentation involves the separation of 3D reconstructions of the two types of bone: the densely packed cortical bone, and the highly porous, lattice-like trabecular bone. However, some outputs and methods of the segmentation process have proved to be unreliable and inefficient. Therefore, this project evaluates the effect of user bias and accesses the precision of segmenting bone types in the distal femur in *Fsh* -/- and *Fsh* +/- knockout mice as compared to wild types (*Fsh* +/+) in Dragonfly Pro bone analysis software. To assess precision and efficiency of bone segmentation, an analysis of twenty-four 3D reconstructions of mouse distal femurs were analyzed by two different users using assisted segmentation in Dragonfly's Bone Analysis Wizard. Bone microstructure outcome measures of bone volume fraction, trabecular thickness, trabecular spacing, and cortical thickness in each bone from each user were compared. The effect of user was then used to determine the exactness of the segmentation process as well as the effectiveness of the methods employed. The results of which support the hypothesis that the increase of FSH levels causes the decrease in bone mass and architecture yet also point to specific improvements that need to be made for accurate segmentation.

This work was supported in part by the Interdisciplinary Quantitative Biology (IQ Biology) program at the BioFrontiers Institute, University of Colorado, Boulder.

Recapitulating the Uremic Condition in an in vitro model to Counteract Cardiovascular Disease 2021 (Duration: 8 weeks)

- Research Advisors: Dr. Stephanie Bryant and Mollie Maples

Abstract: Kidney disease is a leading cause of death for adults in the United States. End-stage kidney disease requires dialysis treatment, which is a process of removing uremic toxins from the blood. Patients typically undergo dialysis treatment a few times a week depending on the severity of their condition. There are many different methods that help support long-term dialysis where the most widely employed methods use fistulas and grafts to establish better access through the combination of an artery and a vein. However, some potential issues with current kidney dialysis methods involve weaker veins, blood clots, infection at the access site, and the frequency and costliness of treatment. To improve the current methods of dialysis, one can simulate the uremic condition *in vitro* by culturing smooth muscle cells with uremic toxins such as urea and phosphate in the cell media and then testing the cellular response. My main

contribution to the project was understanding the uremic condition and how to simulate it. This project utilizes cell culture techniques, materials characterization, polymerase chain reaction (PCR), and imaging to investigate the effects of uremic toxins with the overarching goal to improve AVF (Arteriovenous Fistula) and AVG (Arteriovenous Graft) for more robust access for patients requiring dialysis to treat kidney disease.

This work was supported in part by the Interdisciplinary Quantitative Biology (IQ Biology) program at the BioFrontiers Institute, University of Colorado, Boulder.

Investigating the Effects of Cannabis on Aging and Blood Sugar Regulation 2022 (Duration: 8 weeks)

- Research Advisors: Dr. Angela Bryan, Chasmine Malabanan, and Madeline Stanger

Abstract: Cannabis research is elusive due to its historical legality status. The research that has been done is limited by small sample sizes while still making claims about the benefits and risks of the substance. This led to the following studies: SONIC (Study on Nutrition, Insulin, and Cannabis) and AMBER (Aging and Marijuana: Benefits, Effects, and Risks).

SONIC: Previous studies show cannabis has anti-inflammatory properties, and that users tend to have lower rates of diseases related to blood sugar control, like type 2 diabetes. To study this trend, participants (age 21-40) are distributed into three groups: current users, acute users, and nonusers. Data including information about their insulin regulation (blood glucose tolerance test), sleep, appetite, exercise, and activity is collected from participants at different time intervals dictated by the (non)use of their product. From blood samples collected, different biomarkers (cannabinoids, glucose, RNA, cytokines, etc.) are used to study the effect of cannabis on a biological level. This data is used in a statistical analysis to make further observations/conclusions. This study is aimed to provide stronger evidence that cannabis is related to better blood sugar regulation and/or to learn more about the relationship between cannabis, insulin, and glucose.

AMBER: Older adults are the fastest growing population of cannabis users in the U.S. Many of which explain they use it for purposes as to aid with pain, sleep, anxiety, or depression. In this study, participants (age 60+) are distributed into groups of users and nonusers. They undergo a physical examination and a series of tasks to test their motor control and neurocognition. In addition, participants provide information regarding their feelings towards cannabis and their chronic condition (relating to pain, sleep, anxiety, or depression). Blood samples are collected to track different biomarkers including NFL (Neurofilament light chain), a protein that serves as a marker for aging in the brain. These tasks should provide more insight about the benefits, effects, and risks of older adults using cannabis products as well as how they make decisions regarding cannabis use through observation and a statistical analysis.

[Note: Results are not compiled until the study is complete as to not create bias. This work was supported in part by the Interdisciplinary Quantitative Biology (IQ Biology) program at the BioFrontiers Institute, University of Colorado, Boulder.]

Understanding PNS Functioning and Social Behavioral Traits through Biomarkers after an Acute Stressor 2022-2023 (Duration: 6 months)

- Research Advisors: Dr. Erik Knight and Eleanor Goulden

Abstract: This study explores the possibility of using salivary AChE (acetylcholinesterase), a byproduct of autonomic functioning, as a non-invasive way to measure parasympathetic nervous system (PNS) activity and investigate social determinants of pain, pain-related behavior, and physiology. Participants in this study undergo an acute stressor in which they produce saliva samples at different time intervals for evaluating their response and recovery. The acute stressor in this study is called a cold presser test in which participants hold their hand in water around zero degrees Celsius (i.e., 0-2C), while also being assessed by researchers, until they cannot withstand it any longer. The participants are asked to rate their pain before, during, and after the cold presser test to dictate whether their perceived pain correlates with the biomarkers gathered. Other biomarkers collected in this study include heart rate variability (HRV), cytokines, cortisol, testosterone, and estradiol levels. HRV gives direct insight into the functioning of the PNS allocating a standard to compare to AChE to determine if it is a reliable measure. Cortisol and cytokines are important to index stress responses while levels of testosterone and estradiol will be used to interrogate known gender differences in pain. The expectations of this study include seeing an increase in cortisol and AChE as responses to the stressor. In reaction to the increase in AChE, there is estimated to be a decrease in the PNS's ability to control inflammation response and a decrease in HRV. These measures will help determine the correlations in the autonomic nervous system's (ANS's) response to a stressor, the reliability of those measures as a way to quantify the response as well as any social behavioral effects on the ANS. Physiological and behavioral differences by gender will be explored without *a priori* hypothesized effects.

This work was supported in part by the Interdisciplinary Quantitative Biology (IQ Biology) program at the BioFrontiers Institute, University of Colorado, Boulder.

LEADERSHIP EXPERIENCE

- RockyTech
    - **Team Leader** Polyolefin Upcycling Project 2023-2025
- **Conference**
    - **Presider** ACS Conference in Denver, CO 2024
    - **Conference Leader** Legacy Conference in Belize 2019
- Troy University
    - **President** Square Root of C Math Club 2020-2021
    - **President** Pi Mu Epsilon 2020-2021
    - **President** Troy University Physics Club 2018
    - **Outreach Manager** Troy University Physics Club 2019-2021
    - **Founding Officer** Society of Physics Students 2020
    - **Outreach Manager** Society of Physics Students 2020-2021
    - **Chaplain** Alpha Delta Pi 2017-2018
- Blountstown High School
    - **President** Blountstown High Senior Beta Club 2016-2017
    - **Vice-President** Blountstown High Senior Beta Club 2015-2016
    - **Vice-President** National Honor Society 2015-2016
    - **Chairman** FFA Parliamentary Procedure Team 2015
    - **Team Leader** Blountstown High School FCA 2014-2016

HONORS AND ACHIEVEMENTS

Career

- **Presider** American Chemical Society Conference 2024

College

- **Calculus Competition Winner** Troy University MathFest 2021
- **Pi Mu Epsilon Excellence in Leadership Award** Troy University 2021
- **Magna Cum Laude** Troy University 2021
- **National Science Foundation Integrated Data Science Fellow** University of Colorado Boulder 2021
- **Most Outstanding Woman Award Nominee** Troy University 2021
- **Colorado Diversity Initiative Fellowship** University of Colorado Boulder 2021
- **Ingalls Award Student Committee Member** Troy University 2021
- **ODK Circle Leader of the Year** Troy University 2021
- **NNCI/NIMS Internship Program** Tsukuba, Japan 2020
- **Chancellor's List** Troy University 2020
- **Oral Presentation Award** Alabama Academy of Science Conference in Tuskegee, Alabama 2019
- **Poster Presentation Award** Conference for Undergraduate Women in Physics in Tuscaloosa, Alabama 2019
- **Provost's List** Troy University 2017-2019
- **PME Student Speaker Award** PME Math Conference in Denver, Colorado 2018

High School

- **Highest Average in Calculus II and III** Chipola College 2017
- **Valedictorian** Blountstown High School 2017
- **Millennium Scholar Award** Troy University 2017
- **1st place Scholarship Test** Chipola College Mathematics Olympiad 2017
- **2nd place Advanced Math Individual Award** Wallace Tri-State Mathematics and Computer Science Olympiad 2017
- **4th place Comprehensive Math Individual Award** Wallace Tri-State Mathematics and Computer Science Olympiad 2017
- **Highest Average in Calculus 2 and Calculus 3** Chipola College 2017
- **Fairpoint Scholarship** Blountstown High School 2017
- **Marcus Register Award** Blountstown High School 2017
- **Marine's Scholastic Award** Blountstown High School 2017
- **Dean's List,** Chipola College 2016-2017
- **BHS Sr. Homecoming Court** 2016
- **Usher,** BHS Graduation 2016 (Award to highest overall average Junior)
- **Calhoun County Sunshine State Scholar** 2016
- **Woodman of the World Award** Blountstown High School 2016
- **State Championship,** FFA Parliamentary Procedure 2015
- **4th place Algebra 2 Individual Award** Wallace Tri-State Mathematics and Computer Science Olympiad 2015
- **2nd place Algebra 2 Individual Award** Chipola College Mathematics Olympiad 2015
- **State 1st Runner Up**, FFA Parliamentary Procedure 2014

- **6th place Geometry Individual Award** Chipola College Mathematics Olympiad 2014
- **Perfect Score on Algebra 1 EOC and Geometry EOC** Blountstown High School 2013-2014
- **Rotary Club Award for Sophomore, Junior and Senior Year** (Highest Overall GPA) Blountstown High School 2015-2017
- **Highest average in Algebra I, Geometry, Algebra 2, PreCalculus and Trigonometry** Blountstown High School 2013-2016
- **Highest average in Earth Space Science, Chemistry and Anatomy and Physiology** Blountstown High School 2014-2015
- **Highest average in US History** Blountstown High School 2016
- **Highest average in French** Blountstown High School 2016

STUDENT ORGANIZATION INVOLVEMENT

CU Boulder

Nucleic Acids Chemistry and Biomedicine Symposium (In honor of Marv Caruthers) CU Boulder 2022

Interdisciplinary Quantitative Biology Program, CU Boulder (2021-2022)

A program aimed at solving biological problems without disciplinary boundaries led by Dr. Tom Cech (Nobel Laurate in Chemistry 1989)

Biophysics Supergroup, CU Boulder (2021)
Quantitative Exploration and Discussion (QED) Supergroup, CU Boulder (2021-2023)
Materials Research Society, CU Boulder (2021)

Troy University

Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) (2020)
Optical Society of America (2020)
Acoustical Society of America (2020)
Intermural Volleyball, Troy University (2020)
2nd place in Co-Ed division
Society of Physics Students (2020)
Founding Officer (Outreach Manager) at Troy University 2020
Outreach Manager at Troy University 2020-2021
Mortar Board National Honor Society (2019)
Troy University
Phi Kappa Phi (2019)
Honor Society at Troy University that recognizes the top 7.5% of juniors and top 10% of seniors
American Physical Society (2019)
Who's Who (2018)
Prestigious award presented by faculty and staff at Troy University to students who have excelled in campus involvement and in their academic area
Omicron Delta Kappa [ODK] (2018-2019)
National Leadership Honor Society at Troy University
Vice-President 2019-2020
Pi Mu Epsilon [PME] (2018-2021)
National Mathematics Honor Society at Troy University
President at Troy University 2020-2021
Square Root of C Math Club (2017-2021)

President at Troy University 2020-2021

1st place in math competition of Calculus, Statistics, and Algebra

Physics Club (2017-2021)

Secretary and Interim President at Troy University 2018

Outreach Manager at Troy University 2019-2021

Alpha Delta Pi (2017-2018)

Chaplain of the Epsilon Kappa Chapter at Troy University

FarmHouse (2017)

Pledge Class Sweetheart

Blountstown High School and Chipola College

Blountstown High Senior Beta Club (2015-2017)

President 2016-2017

Vice President 2015-2016

Mu Alpha Theta (2017)

Member of Chipola College Math Club

Phi Theta Kappa (2015-2017)

Member of Chipola College Honor Society

National Honor Society (2015-2017)

Vice President 2015-2016

Varsity Cheerleader (2016-2017)

National Society of High School Scholars (2016-2017)

Academic Competition Club (2014-2017)

Commissioner's Academic Challenge Competition 2016, 2017

Chipola College Mathematics Olympiad

1st place Scholarship Test (2017)

5th place Trigonometry Individual Award (2016)

2nd place Algebra 2 Individual Award (2015)

6th place Geometry Individual Award (2014)

Wallace College Tri-State Mathematics and Computer Science Olympiad

2nd place Advanced Math Individual Award (2017)

4th place Comprehensive Math Individual Award (2017)

4th place Algebra 2 Individual Award (2015)

National FFA (2014-2016)

Chairman of the State Champion Parliamentary Procedure Team 2015

Member of State 1st Runner Up Parliamentary Procedure Team 2014

Fellowship of Christian Athletes (FCA) (2014-2017)

Leadership Team 2014-2016

French Club (2015-2016)

Member of Blountstown French Club

3rd place at (French State Competition)

Le Congres de la Culture Francaise en Floride (2015)

Cross Country (2013-2014)

CERTIFICATIONS

- **Lab Safety and Hazardous Generator Training** 2021, 2023, 2024
- **General Biosafety Training** 2022, 2023
- **Autoclave Use Training** 2023
- **CITI Training in Human Research (Biomedical Research Investigators and Key Personnel)** 2022
- **CITI Training in Human Research (Social Behavioral Research Investigators and Key Personnel)** 2022
- **CITI Training in Social and Behavioral Research Best Practices for Clinical Research** 2022
- **CITI Training in Social and Behavioral Responsible Conduct of Research** 2022
- **Radiation Safety Training for X-Ray Machine Users** 2021
- **SERVSAFE** 2016
- **Microsoft Office Specialist** 2014, 2016

VOLUNTEER/OUTREACH EXPERIENCE

CU Wizards Show 2024

- Performed and guided science demonstrations about plastics for children at CU Boulder

BEST Robotics Troy University 2019

- Helped troubleshoot robots for the teams during competition and practice
- Exchanged robot parts

Conference Leader Belize 2019

- Helped put on the Legacy conference
- Put on a science workshop for the kids; taught them different science techniques and experiments and related the topics to the conference

Trojan Day 2018, 2019, 2021

- Met with potential high school students and talked to them about the physics and math programs/clubs at Troy University

Ronald McDonald House 2018

- Helped clean the house and complete chores for those at the house

Animal Shelter 2018

- Clean out dog kennels
- Walk and feed dogs

Mission Trip, Belize 2017

- Volunteered ten days with a ministry in Belize (YWAM) and
- Helped build a sidewalk
- Talked at schools and on the radio

Teachers Aid 2016-2017

- Grade papers for teachers

Tigers Table, Blountstown High School 2015-2016

- Cooked for the restaurant (Tiger's Table) hosted by Culinary every month

Teen Trendsetters, Blountstown Elementary School 2015-2016

- Helped children learn to read fluently

Switch, Rivertown Community Church 2014

- Assisted in set up and clean up on Wednesday nights for youth