

Grace Brucker

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EDUCATION

Expected May 2025 Bachelor's in Applied Mathematical Science, Bachelor's in Environmental Science and Sustainability
Wesleyan College, Macon, Georgia
GPA: 3.22 | Major GPA: 3.0
Valedictorian of Applied Mathematical Science major

RESEARCH EXPERIENCE

Jan. 2025 - May 2025 "Cardinal Behavior at a Birdbath."
Wesleyan College
Head Researcher
Advisors: Dr. Charles Benesh, Dr. Jim Ferrari
Research Brief: This study examined Northern Cardinal social behavior at a birdbath over two years, focusing on sex-based pairings: female/female, male/male, female/male, and groups of three or more. Using over 4,600 detections from camera data, researchers applied multinomial and Poisson statistical models to assess pairing frequencies and seasonal trends. Female/male pairings dominated (66%), with no male/male sightings and little seasonal variation, challenging expectations about breeding season activity. While the multinomial model captured general trends, the Poisson model poorly fit the data, indicating non-random behavior. The findings suggest complex social dynamics among cardinals and highlight the need for further ecological and behavioral research.

Aug. 2024 - Apr. 2025 "Exploring the Biodegradability of Plastic via the use of Fungi."
Wesleyan College
Head Researcher
Advisor: Dr. Laura Strausberg
Research Brief: Expanding on my research from 2019, I compared the effectiveness of *Aspergillus Flavus* to *Pestalotiopsis Microspora* at degrading soft polymers such as polyurethane. Compared the effectiveness of both fungi with a control, pre-treatment with glycerol, and co-treatment with glycerol. Found that *A. Flavus* was slightly more effective than *P. Microspora*.

Oct. 2023 - Apr. 2024 "Drinking, Perching, and Bathing Habits of Woodpeckers."
Wesleyan College
Head Researcher
Advisor: Dr. Jim Ferrari
Research Brief: Analyzed photographic data for different behaviors (bathing, drinking, perching) in order to find a pattern among different woodpecker species. Compared behaviors across woodpecker species to see what behaviors are more common in what species. Considered environmental effects (such as weather) on woodpecker behaviors to be able to predict their activity in future seasons. Found that woodpecker species are more likely to visit a water source if there has been a drought.

Aug. 2019 - May 2021 "eDNA Analysis of Biofilm using Gold and Silver Nanoparticles."
Paulding County High School
Head Researcher
Advisor: Mark Petersen
Research Brief: Collected biofilm samples to assess the health of the on-campus wetland. Used PCR procedures to quantify and analyze the DNA found in the biofilm. Researched

the use of gold nanoparticles for eDNA detection, but unable to complete due to COVID-19.

Aug. 2019 - May 2021

“Biodegradability of Plastics via Pestalotiopsis Microspora.”

Paulding County High School

Head Researcher

Advisor: Mark Petersen

Research Brief: Collected various plastic types in order to modify its structure to degrade via fungus. Grew fungus in optimal and modified conditions to test which environment was best for degradation. Successfully degraded PETE with a fungus known for degrading only PU, although marginal.

RESEARCH INTERESTS

Neurodegenerative Diseases

Renewable Energy

Plastic Biodegradability

Sustainable Resource Recovery

Conservation Biology

RELEVANT COURSEWORK

Senior 2024-2025

Ecology

Differential Equations

Periodic Motion and Waves

Directed Independent Research Study

Conservation Biology

Probability & Statistics

Junior 2023-2024

Field Biology

Calculus III

College Physics I

Calculus IV

Linear Algebra

College Physics II

Sophomore 2022-2023

Inorganic Chemistry

Programming I

Principles of Environmental Science

Calculus I

Calculus II

Freshman 2021-2022

General Chemistry I

Precalculus Mathematics

General Chemistry II

Special Topics: Principles of Environmental Chemistry

High School

AP Biology

AP Calculus

AP World History

AP Human Geography

AP Environmental Science

AP Physics

AP US History

AP Government
AP Microeconomics
AP Research

TEACHING EXPERIENCE

Aug. 2022 - May 2025 Peer Tutor, All Applied Mathematical Science Courses in College Catalog
Wesleyan College Academic Resource Center

PROFESSIONAL EXPERIENCE

August 2023 - May 2025 Resident Internet Technology Assistant
Wesleyan College, Macon, Georgia
Supervisor: Jan Tedders

May 2024 - August 2024 Vertical Farm Hand and Research Intern
Fresh Harvest Farms, Dahlonaga, Georgia
Owner: Shane Fleeman

AWARDS AND HONORS

2025 Excellence in Science and Mathematics

2025 Wolf Award, awarded for excellence and dedication as a student leader

2024, 2025 Research at Scholarship Symposium Presenter

2024 Margaret Francis Endefielf Mathematics Scholarship

2021- 2025 Munroe Sisters Math and Science Scholarship

2021 - 2024 Provost's List

LEADERSHIP AND EXTRACURRICULAR

Aug. 2022 - May 2025 Class President
Wesleyan College

Aug. 2023 - May 2024 CEO Leadership Peer Mentor for Mathematics and Environmental Studies
underclassmen
Wesleyan College

August 2023 - May 2025 Resident Internet Technology Assistant
Wesleyan College

Aug. 2022 - May 2025 STUNT Executive Chair
STUNT Executive Co-Chair
Class Director

	Wesleyan College
Aug. 2022 - May 2024	Geekly & Girly STEM Club Founder and President Wesleyan College
Aug. 2022 - May 2024	Council on Religious Unity Founder and President Wesleyan College
Aug. 2022 - May 2024	Artistry Club Founder and President Wesleyan College
Aug. 2022 - May 2024	Reframing Club: Life Skills & Feminism Founder and Secretary Wesleyan College
Aug. 2022 - May 2025	Mathematics, Computer Science, and Environmental Studies Tutor Wesleyan College
Jan. 2022 - May 2025	Student Government Association Class Representative Wesleyan College
Jan. 2022 - May 2022	Class Vice President Wesleyan College

PROFESSIONAL REFERENCES

Dr. Charles Benesh

Associate Professor of Mathematics and Physics, Physics Department Chair, Mathematics Department Chair,
Wesleyan College
Email: cbenesh@wesleyancollege.edu

Dr. Cuyler Warnock

Assistant Professor of Mathematics, Wesleyan College
Phone: (478) 757-5185
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Dr. Jim Ferrari

Associate Professor of Biology, Department Chair for Biology, Environmental Studies Program Director,
Arboretum Director, Wesleyan College
Email: jferrari@wesleyancollege.edu

Dr. Laura Strausberg

Associate Professor of Chemistry, Wesleyan College
Email: lstrausberg@wesleyancollege.edu

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