

# James G. DuBose

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Ph.D. Student  
Population Biology, Ecology, and Evolution  
Emory University

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## Education

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Georgia Institute of Technology  
M.S. in Bioinformatics

December 2022

University of Central Arkansas  
B.S. in Biology  
Minors: Chemistry and Anthropology

May 2021

## Appointments

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**NSF Graduate Research Fellow**  
National Science Foundation/Emory University

2023 – Present

**Graduate Teaching Assistant**  
Emory University

2023 – Present

**Graduate Research Assistant**  
Georgia Institute of Technology

2021 - 2022

**Graduate Teaching Assistant**  
Georgia Institute of Technology

2022

**ADS Student Undergraduate Research Fellow**  
Arkansas Department of Higher Education

2019 – 2020

## Research Synopsis

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My primary research interest is in understanding the generation of biodiversity and biological complexity, and I approach this through studying what facilitates and constrains evolutionary change. I have explored this interest in several topics, but I mostly study life cycle evolution and the evolution of endosymbiotic interactions. I like to approach my work from both genetic and ecological perspectives. While my primary focus is on understanding the generation of biodiversity, I am also interested in the conservation of said biodiversity. Here, I combine my interests in life cycle evolution and conservation to study the consequences of anthropogenic environmental and ecological change on (seasonal) phenological dynamics.

## Publications

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**DuBose, J.G.**, de Roode, J.C., The link between gene duplication and divergent patterns of gene expression across a complex life cycle, *Evolution Letters*, 2024. <https://doi.org/10.1093/evlett/qrae028>

**DuBose, J.G.**, de Roode, J.C., Extensive transcriptional differentiation and specialization of a parasite

across its host's metamorphosis, *bioRxiv*, 2024. <https://doi.org/10.1101/2024.07.16.603694> - In review at the *International Journal for Parasitology*

**DuBose, J.G.**, Crook, T.B., Matzkin, L.M., Haselkorn, T.S., The relative importance of host phylogeny and dietary convergence in shaping the bacterial communities hosted by several Sonoran Desert *Drosophila* species, *bioRxiv*, 2024. <https://doi.org/10.1101/2024.05.31.596909> - In review at the *Journal of Evolutionary Biology*

**DuBose, J.G.**, Hoogshagen, M., de Roode, J.C., The role of a non-native host plant in altering the seasonal dynamics of monarch development, *bioRxiv*, 2024. <https://doi.org/10.1101/2024.08.23.609406> - Submitted to *Ecological Entomology*

Pentz, J.T., MacGillivray, K., **DuBose, J.G.**, Conlin, P.L., Reinhardt, E., Libby, E., Ratcliff, W.C., Evolutionary consequences of nascent multicellular life cycles, *eLife*, 2023. <https://doi.org/10.7554/eLife.84336>

**DuBose, J.G.**, Robeson, M.S., Hoogshagen, M., Olsen, H., Haselkorn, T.S., Complexities of Inferring Symbiont Function: Paraburkholderia Symbiont Dynamics in Social Amoeba Populations and Their Impacts on the Amoeba Microbiota, *Applied and Environmental Microbiology*, 2022. <https://doi.org/10.1128/aem.01285-22>

## Teaching

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**Graduate Teaching Assistant, Foundations of Modern Biology** Fall 2024  
Emory University: BIOL 141  
Responsibilities: Lecturing, office hours, grading

**Instructor, Microbial Ecology** Spring 2024  
Emory University: BIOL 470W/IBS 539  
Responsibilities: Course design, primary instruction, lecturing, discussion leading

**Graduate Teaching Assistant, Foundations of Modern Biology** Fall 2023  
Emory University: BIOL 141  
Responsibilities: Lecturing, office hours, grading

**Graduate Teaching Assistant, Biological Principles** Fall 2022  
Georgia Institute of Technology: BIOS 1107  
Responsibilities: Office hours, supplemental instruction, grading

## Talks and Presentations

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**The 3rd Joint Congress on Evolutionary Biology, Talk** July 29, 2024  
**James G. DuBose.** *The role of gene duplication in facilitating divergent patterns of gene expression across the monarch butterfly metamorphosis*

**Front Range Microbiome Symposium 2023, Poster** April 28, 2023  
**James G. DuBose**, Thomas B. Crook, Luciano Matzkin, Tamara S. Haselkorn. *Exploring the contributions of host evolutionary history and diet in shaping the gut microbiota of cactophilic flies*

**ASM South Central Branch 2022, Poster** October 27, 2022  
Thomas B. Crook, **James G. DuBose**, Luciano Matzkin, Tamara S. Haselkorn. *Comparative Microbiome*

## *Analysis of Cactophilic Drosophila Species*

**Arkansas INBRE 2022**, Poster

October 21, 2022

Thomas B. Crook, **James G. DuBose**, Luciano Matzkin, Tamara S. Haselkorn. *The Microbiota of Naturally Acquired Cactophilic Drosophila Species*

**Evolution 2021**, Talk

June 23, 2021

**James G. DuBose**, Tamara S. Haselkorn. *The transmission and diversity of Paraburkholderia in natural D. discoideum populations and its impact on the D. discoideum microbiome*

**Asilomar 2021**, Talk

January 08, 2021

**James G. DuBose**, Tamara S. Haselkorn. *The Domination of Paraburkholderia in the Social Amoeba D. discoideum microbiome and its Impact on the Ecological Relevance of the Farming Symbiosis*

**Arkansas INBRE 2020**, Talk

November 06, 2020

**James G. DuBose**, Tamara S. Haselkorn. *The Genetic Diversity of Bacterial Symbionts in Dictyostelium discoideum Social Amoeba and Their Effect on the Amoeba Microbiome*

**ASM Microbe**, Poster

July 2020

**James G. DuBose**, Hunter Olsen, Tamara S. Haselkorn. *Prevalence and Genetic Diversity of the Burkholderia Bacterial Farming Symbionts in Dictyostelium Discoideum Social Amoeba Populations and their Effect on the Amoeba Microbiome*

**ASM South Central Branch**, Poster

November 01, 2019

**James G. DuBose**, Hunter Olsen, Tamara S. Haselkorn. *Long-term Prevalence Patterns of the Burkholderia Farming Symbiont in Dictyostelium discoideum Social Amoeba Populations*

## Grants and Funding Awards

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**NSF Graduate Research Fellowship**

2023-2028

Award: \$159,000

Proposal: *Investigating heritable symbiont-mediated adaptation to climate change*

**Computational Biology Graduate Research Assistantship**

2022

Award: \$4,200

Proposal: *A multi-omics approach for comparing the physiological differences between slow and fast-growing bacteria*

**UCA College of Natural Sciences and Mathematics Student Research Funding**

2021

Award: \$1,000

Proposal: *The horizontal transmission of the Paraburkholderia bacterial farming symbiont and its effects on the microbiome of the social amoeba D. discoideum*

**Advancement of Undergraduate Research in the Sciences (AURS)**

2019

Award: \$5,000

Proposal: *Ecological relevance of the amoeba farming symbiosis: the prevalence of the Burkholderia bacterial symbiont in natural populations, and its effect on the amoeba microbiome*

## Outreach and Volunteering

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**US Fish and Wildlife Service Monarch Butterfly Festival**

Each year, the US Fish and Wildlife Service hosts an education-oriented festival in St. Marks, Florida, where

monarchs are captured and tagged for research purposes. Each year, the de Roode lab participates with our own educational booth where we discuss and screen for monarch parasites with the general public.

### **Rosalynn Carter Butterfly Trail**

The Rosalynn Cater Butterfly Trail is a program that aims to increase habitat for native pollinators. I am frequently involved in various programs and events organized by the Rosalynn Cater Butterfly Trail, including their annual Spring symposium that is focused on communicating best practices in pollinator habitat construction, as well as various projects that involve planting said habitats.

### **Programming Education Resources for Historically Minoritized Groups in Computing**

In collaboration with DataWorks, a data service provider that employs people from communities that have historically had less access to computational resources and education, I developed and taught an introductory Python course that was specifically designed for people with no prior computational experience.

## Employment

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### **Emory University**

Department of Biological Sciences

January 2023 – Present

### **Georgia Institute of Technology**

School of Biological Sciences

January 2022 – December 2022

### **Arkansas Department of Health**

Public Health Laboratories: Molecular Biology Unit, COVID-19 Unit

March 2021 – July 2021

### **University of Central Arkansas**

Tutoring Center

August 2019 – May 2021

### **University of Central Arkansas**

Biology Department

June 2020 – August 2020

## References

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Dr. Jaap de Roode  
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Emory University  
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Dr. Tammy Haselkorn  
Associate Professor, Department of Biology  
University of Central Arkansas  
Email: [thasekorn@uca.edu](mailto:thasekorn@uca.edu)

Dr. William Ratcliff  
Associate Professor, Department of Biology  
Georgia Institute of Technology  
Email: [william.ratcliff@biology.gatech.edu](mailto:william.ratcliff@biology.gatech.edu)