

# James G. DuBose

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

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903-946-6255

## Education

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

Currently enrolled

M.S. in Bioinformatics  
Georgia Institute of Technology

December 2022

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

May 2021

## Appointments

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**NSF Graduate Research Fellow**  
U.S. 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. (2025) Extensive transcriptional differentiation and specialization of a parasite across its host's metamorphosis. *International Journal for Parasitology* (in press).  
DOI: 10.1016/j.ijpara.2025.01.006
- DuBose, J.G.**, de Roode, J.C. (2024) The link between gene duplication and divergent patterns of gene expression across a complex life cycle. *Evolution Letters*. 8 (5): 726-734.  
DOI: 10.1093/evlett/qrae028
- DuBose, J.G.**, Crook, T.B., Matzkin, L.M., Haselkorn, T.S. (2024) The relative importance of host phylogeny and dietary convergence in shaping the bacterial communities hosted by several Sonoran Desert *Drosophila* species. *Journal of Evolutionary Biology* (in press).  
DOI: 10.1093/jeb/voae143
- Pentz, J.T., MacGillivray, K., **DuBose, J.G.**, Conlin, P.L., Reinhardt, E., Libby, E., Ratcliff, W.C. (2023) Evolutionary consequences of nascent multicellular life cycles. *eLife*. 12:e84336.  
DOI: 10.7554/eLife.84336
- DuBose, J.G.**, Robeson, M.S., Hoogshagen, M., Olsen, H., Haselkorn, T.S. (2022) Complexities of Inferring Symbiont Function: *Paraburkholderia* Symbiont Dynamics in Social Amoeba Populations and Their Impacts on the Amoeba Microbiota. *Applied and Environmental Microbiology*. 88 (18): e01285-22.  
DOI: 10.1128/aem.01285-22
- DuBose, J.G.**, Morran, L.T. (2024) Reduced signatures of gene duplication and non-random gene organization in shaping stage-specific patterns of gene expression across a relatively simple life cycle. *bioRxiv*.  
DOI: 10.1101/2024.12.21.629888
- DuBose, J.G.**, Hoogshagen, M., de Roode, J.C. (2024) The role of a non-native host plant in altering the seasonal dynamics of monarch development. *bioRxiv*.  
DOI: 10.1101/2024.08.23.609406

## Teaching

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| <b>Graduate Teaching Assistant, Regression Analysis</b><br>Emory University: QTM 220<br>Responsibilities: Weekly lab instruction, office hours, grading               | Spring 2025 |
| <b>Graduate Teaching Assistant, Foundations of Modern Biology</b><br>Emory University: BIOL 141<br>Responsibilities: Lecturing, office hours, grading                 | Fall 2024   |
| <b>Co-instructor, Microbial Ecology</b><br>Emory University: BIOL 470W/IBS 539<br>Responsibilities: Course design, primary instruction, lecturing, discussion leading | Spring 2024 |
| <b>Graduate Teaching Assistant, Foundations of Modern Biology</b><br>Emory University: BIOL 141<br>Responsibilities: Lecturing, office hours, grading                 | Fall 2023   |

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

Fall 2022

## 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**  
Award: \$159,000  
Proposal: *Investigating heritable symbiont-mediated adaptation to climate change*

2023-2028

<b>Computational Biology Graduate Research Assistantship</b> Award: \$4,200 Proposal: <i>A multi-omics approach for comparing the physiological differences between slow and fast-growing bacteria</i>	2022
<b>UCA College of Natural Sciences and Mathematics Student Research Funding</b> Award: \$1,000 Proposal: <i>The horizontal transmission of the Paraburkholderia bacterial farming symbiont and its effects on the microbiome of the social amoeba D. discoideum</i>	2021
<b>Advancement of Undergraduate Research in the Sciences (AURS)</b> Award: \$5,000 Proposal: <i>Ecological relevance of the amoeba farming symbiosis: the prevalence of the Burkholderia bacterial symbiont in natural populations, and its effect on the amoeba microbiome</i>	2019

## 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 History

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<b>Emory University</b> Department of Biological Sciences	January 2023 – Present
<b>Georgia Institute of Technology</b> School of Biological Sciences	January 2022 – December 2022
<b>Arkansas Department of Health</b> Public Health Laboratories: Molecular Biology Unit, COVID-19 Unit	March 2021 – July 2021
<b>University of Central Arkansas</b> Tutoring Center	August 2019 – May 2021
<b>University of Central Arkansas</b> Biology Department	June 2020 – August 2020

## References

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Dr. Levi T. Morran  
Associate Professor, Department of Biology  
Emory University  
Email: levi.morran@emory.edu

Dr. Tamara S. Haselkorn  
Associate Professor, Department of Biology  
University of Central Arkansas  
Email: thasekorn@uca.edu

Dr. Christopher P. Catano  
Assistant Professor, Department of Botany & Plant Sciences  
University of California, Riverside  
Email: chcatano@gmail.com