

# LUKE E. HEARON

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## EDUCATION

**Doctor of Philosophy, Entomology** 2024 – Current  
*Columbus, OH, The Ohio State University*

Advisor: Dr. Reed Johnson

**Master's of Science, Entomology** 2020 – 2023  
*Champaign, IL, The University of Illinois, Urbana-Champaign*

Advisor: Dr. Carla E. Cáceres

Thesis available at [ideals.illinois.edu/items/127368](https://ideals.illinois.edu/items/127368)

**Post-baccalaureate coursework** 2019 – 2020  
*Philadelphia, PA, University of Pennsylvania*

**Post-baccalaureate coursework** 2020  
*Philadelphia, PA, Temple University*

**Bachelor of Science in Entomology** 2015 – 2019  
*Columbus, OH, The Ohio State University*

*Cum laude* with research distinction

Minor in Evolution and Ecology

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## FUNDING

### FELLOWSHIPS

**Illinois Distinguished Fellowship (\$75,000)** 2020 – 2023  
*University of Illinois, Urbana-Champaign*

### GRANTS (\$13,975 TOTAL)

**Honey Bee Health Improvement Project (\$9,975)** 2026 – 2027  
*North American Pollinator Protection Campaign* · “Understanding Daily Foraging Patterns to Protect Pollinators from Pesticides” · **Hearon, L.E.**, Johnson, R.M.

**Francis M. and Harlie M. Clark Research Support Grant (\$1,000)** 2021  
*University of Illinois, Urbana-Champaign (internal)* · “Impacts of Parasitized Prey upon Predator Fitness in the Predator-Spreader System” · **Hearon, L.E.**

**Ohio State Beekeepers Association Research Grant (\$3,000)** 2018  
*Ohio State Beekeepers Association* · “Soybean or Clover: Pollen Analysis to Determine Floral Source of Ohio Summer Honey” · Johnson, R.M., **Hearon, L.E.**

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## SCIENTIFIC PUBLICATIONS

### PEER REVIEWED

**buzzdetect: an open-source deep learning tool for automated bioacoustic pollinator monitoring** 2025  
Hearon, L.E., Johnson, L.H.P., Underwood, J., Lin, C.H., Johnson, R.M. · *Journal of Insect Science (in press)*

<https://doi.org/10.1093/jisesa/ieaf104>

**Testing mechanisms driving the increased susceptibility of \*Daphnia\* to disease when exposed to \*Chaoborus\* cues** 2025

Hearon, L.E., Cáceres, C.E. · *Journal of Plankton Research*

<https://doi.org/10.1093/plankt/fbaf072>

**Quantitative multi-locus metabarcoding and waggle dance interpretation reveal honey bee spring foraging patterns in Midwest agroecosystems** 2018

Richardson, R.T., Curtis, H.R., Matcham, E.G., Lin, C.H., Suresh, S., Sponsler, D.B., Hearon, L.E., Johnson, R.M. · *Molecular Ecology*

<https://doi.org/10.1111/mec.14975>

### IN PRESS

**Assessing the Repellency of an Insecticide-Fungicide Combination to Bees using Bioacoustics** 2026  
Johnson, L.H.P., Hearon, L.E., Lin, L.H., Lindsey, L.E., Johnson, R.M. · *Journal of Visualized Experiments*

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## POSITIONS HELD

**Research Technician** 2023 – 2024

- PI: Dr. Reed Johnson
- Created buzzdetect, a machine learning tool for automated detection of honey bee flight buzzes in audio. buzzdetect is still under production, but latest versions can be found on the Bee Lab GitHub at [github.com/OSU-Bee-Lab/buzzdetect](https://github.com/OSU-Bee-Lab/buzzdetect)
- Designed, executed, and analyzed laboratory component of project studying effects of mustard pollen on *Vairimorpha* infection in adult honey bees; assisted in design, execution, and analysis of field component.
- Networked and collaborated researchers from other universities

**Plant Protection Intern** 2019 – 2020

- Operated the Arboretum Plant Clinic; diagnosed plant, pest, and disease submissions, communicated relevant information regarding identification, treatment, and plant care in a manner appropriate to the expertise of the client
- Scouted arboretum grounds and greenhouse for pest, pathogen, or cultural problems; summarized the problem, its cause, and treatment recommendations to the relevant superior
- Designed and conducted research project quantifying bycatch of sticky bands used to trap spotted lanternfly; presented results before Arboretum staff and communicated them to local homeowners, governmental authorities, and academic experts
- Spearheaded Arboretum informational material regarding spotted lanternfly, including official responses to common questions and classes aimed at expertise levels from children to experienced gardeners

## Student Researcher

2018 – 2019

- PI: Dr. Reed Johnson
- Project: Pollen analysis to determine floral source of Ohio summer honey
- Sought to determine the contribution of soybean flowers to Ohio honeys
- Adapted existing palynological methodologies to suit research project
- Developed novel geographic information system (GIS) landscape analysis method to quantify presence of soybean around honey bee hives
- Presented progress and results at academic and professional conferences

## Student Research Assistant

2016 – 2018

- Assisted postdoctoral researcher Chia-Hua Lin, doctorate student Rodney Richardson, and master's student Natalia Riusech
- Independently performed routine hive evaluations for the Sentinel Apiary Program
- Conducted in vivo bioassay for potential miticide for use in bee hives
- Conducted GIS landscape analysis
- Reared worker and queen brood for use in toxicological studies
- Conducted regular colony maintenance and inspections

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## TEACHING

### INVITED LECTURES

#### Drafting Scientific Manuscripts with Quarto

AU 2025

*The Ohio State University, ENTMLGY 7930 - Scientific Writing*

Lecture on using fully-reproducible, project-based workflows to produce scientific manuscripts with RStudio and Quarto

### TEACHING ASSISTANTSHIPS

#### BIO 1113 - Biological Sciences: Energy Transfer and Development

AU 2024

*The Ohio State University*

#### ENTMLGY 5800 - Pesticide Science

*The Ohio State University*

AU18, SP19, AU23, SP24, SP26

#### ENTMLGY 2200 - Beekeeping

*The Ohio State University*

SP18, SP26

### WORKSHOPS

#### Principled Programming and Mouth Pipetting (workshop series)

SP 2023

*University of Illinois, Graduates in Ecology Workshop Series*

Three-part series teaching best practices and reproducible workflows for data manipulation, analysis, and graphing.

#### Discussion Group - Science Before Statistics

AU 2022

*University of Illinois*

Facilitated two-part discussion group watching and working through Richard McElreath's lecture "Science Before Statistics: Causal Inference"

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## SCIENTIFIC PRESENTATIONS

### ORAL PRESENTATIONS

- Daily pollinator activity patterns vary strongly between plants 2026  
*The Ohio State University Plant Sciences Symposium, Columbus, OH · Hearon, L.E., Johnson R.M. · 2nd in class*
- Investigating differing daily foraging patterns in bee-attractive flowers 2026  
*American Bee Research Conference, Mobile, AL · Hearon, L.E., Johnson R.M.*
- Understanding Daily Foraging Patterns to Protect Pollinators 2026  
*The Ohio State University Global One Health Day, Columbus, OH · Hearon, L.E., Johnson R.M. · invited*
- Comparing diel pollinator foraging patterns between patches using passive acoustic monitoring 2025  
*Entomological Society of America, Portland, OR · Hearon, L.E., Johnson R.M. · invited*
- Impacts of weather on daily foraging patterns in soybeans 2025  
*American Bee Research Conference, Reno, NV · Hearon, L.E., Lin, C.H., Johnson R.M.*
- “When bees are actively foraging” – Using bioacoustics to monitor pollinators 2024  
*Entomological Society of America, Phoenix, AZ · Hearon, L.E., Johnson, R.M.*
- Looking for spatial patterns with acoustic detection (flash talk) 2024  
*EcoSpatial Summit, College Station, PA · Hearon, L.E., Johnson R.M.*
- buzzdetect: a machine learning tool for automated acoustic detection of honey bee activity 2024  
*American Bee Research Conference, New Orleans, LA · Hearon, L.E., Johnson R.M.*
- Effects of predator cues and pathogen exposure on \*Daphnia dentifera\* 2023  
*UIUC Graduates in Ecology Annual Research Colloquium, Champaign, IL · Hearon, L.E.*
- What’s the Catch? Collateral mortality of spotted lanternfly sticky banding 2020  
*The Morris Arboretum, Philadelphia, PA · Hearon, L.E.*
- Establishing a correlation between soybean presence and soybean foraging by \*A. mellifera\* 2019  
*American Bee Research Conference, Tempe, AZ · Hearon, L.E., Johnson R.M.*

### POSTER PRESENTATIONS

- Non-consumptive effects of an insect predator on the dynamics of its prey’s disease (2nd in class) 2022  
*Entomological Society of America Annual Meeting, Vancouver, BC, Canada · Hearon, L.E., Cáceres C.E. · 2nd in class*
- Soybean cropland as foraging source for the European honey bee and predictor of honey content (2nd in class) 2019  
*Ohio State University CFAES Undergraduate Research Forum, Columbus, OH · Hearon, L.E., Johnson R.M. · 2nd in class*
- Establishing a correlation between soybean presence and soybean foraging by \*A. mellifera\* 2019  
*The Richard J. and Martha D. Denman Undergraduate Research Forum, Columbus, OH · Hearon, L.E., Johnson R.M.*
- Establishing a correlation between soybean presence and soybean foraging by A. mellifera 2018  
*Ohio State University CFAES Undergraduate Research Forum, Columbus, OH · Hearon, L.E., Johnson R.M.*

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## SCIENCE COMMUNICATION

### WRITTEN

- Letters to a Pre-Scientist** 2021 – 2022  
Participated in a pen-pal program pairing scientists with students in underprivileged schools, encouraging pen-pals to engage with science and consider careers in STEM.
- A Host of Issues** 2019  
<https://www.gridphilly.com/grid-magazine/2019/9/16/a-host-of-issues>
- What You Need to Know About the Spotted Lanternfly** 2019  
<https://www.morrisarboretum.org/pdf/Volunteer-August-2019.pdf>
- Honey Pollen Results from 2017 OSBA Fall Conference** 2019  
Johnson, R.M., Hearon, L.E. 2019. OSBA Newsletter 8(2):7-8.  
<http://www.ohiostatebeekeepers.org/wp-content/uploads/2019/04/OSBA-2019-2nd-Quarter.pdf>
- Initial Results of Pollen Analysis from Honey** 2018  
OSBA Newsletter 7(4):11, 19.  
<http://www.ohiostatebeekeepers.org/wp-content/uploads/2018/10/OSBA-4th-QTR-2018.pdf>

### IN - PERSON

- Cáceres Lab Outreach (X-Time summer camp)** 2023
- Organized and participated in multiple outreach events in collaboration with X-Time summer camp.
  - Used hands-on activities to teach children about food webs and ecosystem dynamics.
- UIUC “Insect Petting Zoo”** 2021 – 2022
- Assisted presenting the UIUC “Insect Petting Zoo” at: Mahomet-Seymour Junior High School (Fall 2021), Little Hearts and Hands Academy (Spring 2022), X-Time summer camp (Summer 2022), Peggy Notebaert Nature Museum “Bugapalooza” (Summer 2022).
- “Spotted Lanternfly—What You Need to Know”** 2020  
A workshop delivered to homeowners on SLF treatment, prevention, and the current state of the research. Approved for Pesticide Recertification Training Credit by the Pennsylvania Department of Agriculture.
- “A Spotted Lanternfly Presentation For Kids”** 2019  
Hosted at Belmont Hills Library and Radnor Memorial Library.  
Oriented toward children of middle school age and below; covered invasive insects and conservation.

### PUBLIC PRESENTATIONS

- 90,000 hours of listening; Foraging patterns from three insects, two dozen flowers, and a solar eclipse** 2025  
Hearon, L.E., Johnson, R.M.
- Evaluating the attractiveness of soybean cultivars using bioacoustics** 2023  
Hearon, L.E., Lin, C.H., Johnson R.M. 2023.
- Golden Forage: Can mustard cover crops provide both food and medicine for bees?** 2023  
Hearon, L.E., Lin, C.H., Johnson R.M. 2023.
- Soybean vs. Clover: Summertime honey production in Ohio** 2018  
Johnson, R.M., Hearon, L.E.

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## MENTORING

**Greta Keilman** 2021 – 2023  
*Undergraduate Mentee, University of Illinois, Urbana-Champaign*

- Mentored undergraduate student Greta Keilman, summer 2021 through spring 2023.
- Assisted in the creation, execution, and analysis of two independent research projects.
- Greta presented results at multiple undergraduate research forums.

**Hayden Goldspink** 2021 – 2022  
*Undergraduate Mentee, University of Illinois, Urbana-Champaign*

- Mentored undergraduate student Hayden Goldspink, summers 2021 and 2022.
- Assisted in the creation and execution of an independent research project.
- Hayden presented results at the iBio undergraduate research symposium in 2022.

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## EXTRACIRRICULAR

### STUDENT POSITIONS

Graduate Studies Committee Representative 2025 – 2026

Treasurer 2022 – 2023

Faculty Liaison 2022 – 2023

Webmaster 2021 – 2022

Social Co-Chair 2021 – 2022

### OUTREACH

**Insect Fear Film Festival** 2024 – 2025  
Helped host the event, introduced movie, ran activity tables

**Insect Fear Film Festival** 2021 – 2023

- Assisted in planning and preparation of films (2021, 2022, 2023).
- Served as webmaster and projectionist (2021, 2022); edited and controlled presentation of all media (2022);
- Coordinated with event staff.