# Meghan Barrett, PhD

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Appointments

March 2022-2024 **NSF Postdoctoral Research Fellow**

Primary Advisor: Terry McGlynn, PhD (*California State University Dominguez Hills*)

Secondary Advisors: Andrea Armani, PhD (*University of Southern California)*; Liping Wang, PhD (*Arizona State University*)

Education

2022 **PhD in Biological Sciences,** *Drexel University*

Minor: Undergraduate STEM Education

Advisor: Sean O’Donnell, PhD

2022 **MS in Teaching, Learning, and Curriculum,** *Drexel University*

Concentration: Higher Education

2016 **BS in Biological Sciences, summa cum laude, second major in**

**English/Creative Writing with Honors College minor,** *State University*

*of New York at Geneseo*

Additional Training

2020 **Essentials of Online Learning Course,** Drexel Online Learning Council

2018 **Analysis of Organismal Form Course,** University of Manchester, UK, online

2018 **The POGIL Project,** Drexel University, Philadelphia, PA

2017-2019 **Center for the Integration of Teaching, Research, and Learning Network**, Associate Level

2017 **Bee Course,** Southwestern Research Station, Portal, AZ

Publications

*Google scholar metrics:* citations: 128; h-index: 7; i10-index: 4

**Published Papers**

21. **Barrett M,** Fischer B (2023). Challenges in farmed insect welfare: Beyond the question of

sentience. *Animal Welfare*. DOI: 10.1017/awf.2022.5.

20. **Barrett M,** Fischer B, Buchmann S (2023). Informing policy and practice on insect pollinator

declines: Tensions between conservation and animal welfare. *Frontiers in Ecology and Evolution*,

10: 1071251.

19. **Barrett M,** Johnson MG (2022). *Centris pallida* (Hymenoptera: Apidae) male body size decreases

across five decades. *Ecological Entomology.* DOI: 10.1111/een.13210

18. Gibbons M, Crump A, **Barrett M,** Sarlak S, Birch J, Chittka L (2022). Can insects feel pain? A

review of the neural and behavioral evidence. *Advances in Insect Physiology*, DOI:

10.1016/bs.aiip.2022.10.001

17. O’Donnell S, Bulova S, **Barrett M** (2022). Brain plasticity indicates key cognitive demands in an

animal society: caste comparisons in dampwood termites. *Insectes Sociaux,* 69: 307-314.

16. **Barrett M,** Chia SY, Fischer B, Tomberlin JK (2022). Farmed Black Soldier Fly, *Hermetia*

*illucens* (Diptera: Stratiomyidae), Welfare Considerations: A Model for the Insects as Food

and Feed Industry. *Journal of Insects as Food and Feed,* DOI: 10.3920/JIFF2022.0041.

15. **Barrett M,** Godfrey RK, Sterner EJ, Waddell EA (2022). Impacts of development and adult sex

on brain cell numbers in the Black Soldier Fly, *Hermetia illucens* L. (Diptera: Stratiomyidae).

*Arthropod Structure and Development,* 70: 101174.

14. Baudier K, Bennett M, **Barrett M,** Cossio F, O’Donnell S, Fewell J, Harrison J, Pavlic T (2022).

Soldier neural architecture is flexibly modality-specialized but poorly predicted by repertoire

size in the stingless bee *Tetragonisca angustula. Journal of Comparative Neurology,* 530: 672-682.

13. **Barrett M,** Kang A, Gomez A, Kainth D, O’Donnell S (2021). Nest architecture, prey, and body

size in *Isodontia auripes* (Fernald) at two sites in New York (Hymenoptera: Sphecidae). *Journal*

*of the Kansas Entomological Society*, 94: 199-212.

12. Caponera V, Aviles L, **Barrett M,** O’Donnell S (2021). Behavioral attributes of social groups

determine the strength and direction of selection on neural investment. *Frontiers in Ecology and*

*Evolution,* DOI: 10.3389/fevo.2021.733228.

11. O’Donnell S, Bulova S, **Barrett M** (2021).Experience-expectant brain plasticity corresponds to

caste-specific abiotic challenges in dampwood termites (*Zootermopsis angusticollis* and *Z.*

*nevadensis*). *Science of Nature,* 108: 57.

10. **Barrett M** (2021).The first case of gynandromorphy in *Centris pallida* (Hymenoptera: Apidae:

Centridini). *Journal of Melittology,* 104: 1-8.

9. **Barrett M,** Schneider S, Sachdeva P, Gomez A, Buchmann S, O’Donnell S (2021). Neuroanatomical differentiation associated with alternative reproductive tactics in male arid land bees, *Centris pallida* and *Amegilla dawsoni. Journal of Comparative Physiology A*, 207: 497-504.

8. **Barrett M,** McNair C,Caponera V, O’Donnell S, Marenda D (2020). Potential for use of erythritol as a socially-transferrable ingested insecticide for ants (Hymenoptera: Formicidae). *Journal of Economic Entomology,* toaa019.

7. **Barrett M1,** Fiocca K1, Waddell E, McNair C, O’Donnell S, Marenda D (2019). Larval mannitol diets increase mortality, prolong development, and decrease adult body sizes in fruit flies (*Drosophila melanogaster*)*. Biology Open,* 8: bio047084.

6. Fiocca K1, **Barrett M1,** Waddell E, Vivieros J, McNair C, O’Donnell S, Marenda D (2019).

Mannitol ingestion causes concentration-dependent, sex-biased mortality in *Drosophila*

*melanogaster. PLoS One,* 14: e0213760.

5. Caponera V, **Barrett M,** O’Donnell S, Marenda D (2019). Erythritol causes concentration-

dependent mortality in the Eastern subterranean termite (Blattodea: Rhinotermitidae). *Journal*

*of Economic Entomology,* toz260.

4. O’Donnell S, Bulova S, DeLeon S, **Barrett M,** Fiocca K (2019). Brain structure differences

between solitary and social wasp species are independent of body size allometry. *Journal of*

*Comparative Physiology A,* DOI 10.1007/s00359-019-01374-w.

3. O’Donnell S, Bulova S, **Barrett M,** von Beeren C (2018). Brain investment under colony-level

selection: soldier specialization in Eciton army ants (Formicidae: Dorylinae). *BMC Zoology,*

3:3.

2. O'Donnell S, Bulova S, **Barrett M,** Fiocca K (2017). Size constraints and sensory adaptation in

brain architecture (paper wasps - Vespidae: Epiponini). *Biological Journal of the Linnean Society,*

blx150.

1. O'Donnell S, Bulova S, DeLeon S, **Barrett M,** Fiocca K (2017). Caste differences in the

mushroom bodies of swarm-founding paper wasps: implications for brain plasticity and brain evolution (Vespidae, Epiponini*). Behavioral Ecology and Sociobiology,* 71:116.

1Co-first author

**In Press Papers**

22. **Barrett M,** Fischer B. Introducing ‘Ethos’: A regular forum for interdisciplinary conversations about ethics in entomology. (*American Entomologist*)

**Preprints & Submitted Manuscripts**

23. **Barrett M,** O’Donnell S. Individual reflectance of solar radiation confers a thermoregulatory

benefit to dimorphic males bees (*Centris pallida*) using distinct microclimates. (*PLoS ONE*)

+ Preprint DOI: <https://www.biorxiv.org/content/10.1101/2022.06.28.497958v2>

24. **Barrett M,** Tigreros N, Davidowitz G, O’Donnell S. Adaptive variation in sex and male size

morph critical thermal maxima in *Centris pallida* male desert bees.

+ Preprint DOI: <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4085466>

25. **Barrett M,** Raffel T, Fischer B. ‘Biologically Degenerate, Ecologically Marginal’: Parasites as a

Case Study in Societal Values Impacting Ecological Research. (*Philosophy, Theory, and Practice*

*in Biology*)

26. Crump A, Gibbons M, **Barrett M,** Birch J, Chittka L. Insect pain and its welfare implications.

(*PLoS Biology*).

**Books & Book Chapters**

Multiple chapters within *Weighing Animal Welfare*, edited by Bob Fischer. *Forthcoming with Oxford University Press, 2023.*

Research Support & Fellowships

2023 **OP Animal Welfare Research Grant - $268,684.00**

Wrote research proposal, funds managed by Rethink Priorities; Funder: Open

Philanthropy

2022 **OP Animal Welfare Research Grant - $468,003.93**

Wrote research proposal, funds managed by Rethink Priorities; Funder: Open

Philanthropy

2022 **EA Animal Welfare Research Grant - $64,000**

Wrote research proposal, funds managed by Rethink Priorities; Funder: EA

Animal Welfare Fund

2021 **NSF Postdoctoral Research Fellowship in Biology - $128,000**

Funder: National Science Foundation

2020 **Microscopy Training Fellowship - $1,000**

Funder: American Microscopical Society

2020 **Robert L. and Louise B. Jeanne Social Wasp Research Grant - $2,500**

Funder: International Union for the Study of Social Insects

2020 **PEO Scholar Award - $15,000**

Funder: International Chapter of the PEO Sisterhood

2020 **Animal Behavior Society Student Research Grant - $1,000**

Funder: Animal Behavior Society

2019 **SysEB Student Research Travel Award - $1,450**

Funder: Entomological Society of America

2019 **American Philosophical Society Lewis and Clark Grant - $2,100**

Funder: American Philosophical Society

2018 **Eva Crane Trust Research Grant - $10,554.74**

Co-PI with Dr. Dane Ward; Funder: Eva Crane Trust

2018 **Huyck Preserve Research Grant – $2,500**

Funder: Huyck Preserve

2016 **College of Arts & Sciences Dean’s Fellowship - $10,000**

Drexel University

Honors and Awards

2022 George C. Eickwort Student Research Award, *International Union for the Study of Social*

*Insects North American Section*

2018, 2019, Graduate College Continuing Excellence in Teaching Assistance Award, *Drexel*

& 2021 *University*

2018 College of the Arts and Sciences Mentorship Award, *Drexel University*

2017 & 2018 College of the Arts and Sciences Teaching Assistance Excellence Award, *Drexel*

*University*

2017 American Museum of Natural History Bee Course Tuition Scholarship, *AMNH*

2016 Biology Leadership Award for Excellence in Teaching, *SUNY Geneseo*

2016 SUNY Chancellor’s Award for Student Excellence, *SUNY-wide*

2016 SUNY Geneseo Opportunities for Leadership Development Platinum Award,

*SUNY Geneseo*

2012-2016 Model A Ford Club of America Youth Scholarship, *Model A Ford Club of America*

2012-2016 Edgar Fellows Honors College and Award, *SUNY Geneseo*

2015 Greek Woman of the Year, *SUNY Geneseo*

2015 Natalie Selser Freed Memorial Scholarship, *SUNY Geneseo*

2015 Bill & Stacey Edgar Annual Geneseo Scholarship, *SUNY Geneseo*

2014-2015 Promotional Products Education Foundation Scholarship, *Promotional Products*

*Association International*

2012-2015 Scholar in Residence Award, *SUNY Geneseo*

2014 Student Association Merit Scholarship for Leadership, *SUNY Geneseo*

**Honor Society Inductions**

Sigma Xi (2021), Phi Beta Kappa (2015), Sigma Tau Delta (2015), National Order of Omega (2015), Tri-Beta (2014), Phi Eta Sigma (2014), Golden Key (2014)

**Awards in Support of Travel**

2022 IUSSI Travel Award, *IUSSI-North American Section*

2019 Drexel Teck-Kah Lim Graduate Student Domestic Travel Subsidy Award, *Drexel*

*University*

2018 USDA-AFRI Travel Award, *IUSSI-North American Section*

2018 International Travel Award, *Drexel University*

2017-2019 Drexel Department of Biology Travel Awards, *Drexel University*

2017 Three Rivers Evolution Event Travel Award, *American Society of Naturalists*

2015 Student Travel Grant, *SUNY Geneseo*

**Conference Organizing Awards**

2018 Entomological Society of America Support of Small Meeting Sponsorship (Social

Insects in the North-East Regions meeting), *Entomological Society of America*

2018 IUSSI Support of Small Meeting Award (Social Insects in the North-East Regions

meeting), *International Union for the Study of Social Insects*

2018 ASN Conference Award (Evolution in Philadelphia Conference), *American Society of*

*Naturalists*

2018 Small Meeting Award (Social Insects in the North-East Regions meeting), *Company of*

*Biologists*

2018 GSA Career Development Symposia Award (Evolution in Philadelphia Conference),

*Genetics Society of America*

Higher Education Teaching Experience

**Courses**

2016-2021 **Applications in Biology I and II, BIOL 207 + 208**

Teaching Assistant, Biology Department, Drexel University

*Role:* Prior to 2019, created some class materials, graded all

assignments, sole instructor present in classroom. In 2019, redesigned

courses using PBL active learning; created all course materials and the

syllabi, graded all coursework, led all class sessions, etc. In 2020, redesigned courses for online instruction, recorded all lectures, taught and graded 3 online sections/term, still with active learning focus.

2019 **Cellular, Molecular, and Developmental Biology II, BIOL 211**

Teaching Assistant, Biology Department, Drexel University

2018, 2020 **Principles in Molecular Biology, BIOL 218**

Teaching Assistant, Biology Department, Drexel University

2013-2015 **General Biology Laboratory for Freshman Majors, BIO 116** Undergraduate Laboratory Instructor, Biology Department, SUNY Geneseo

2014 **General Biology: Diversity, Physiology, Ecology, BIO 119**

Supplemental Instructor, Biology Department, SUNY Geneseo

**Invited Guest Lectures**

2023 “The Role of Animal Behavior in Animal Ethics (and vice versa)”, BSC 555:

Animal Behavior, *University of Southern Mississippi*

2022 “Insect Ethics”, PHIL 322: Animal Ethics, *Pacific University*

2020 “Temperature Effects on Mating Behavior”, BIO 339: Animal Behavior,

*SUNY Geneseo*

2019 “Alternative Reproductive Tactics”, BIO 339: Animal Behavior, *SUNY*

*Geneseo*

2019 “Successful Science Communication in Environmental Science”, XLRN

188: Nature History and Sustainability, *SUNY Geneseo*

2019 “Thermoregulation and Behavior”, BIO 345: Biology of Insects, *SUNY*

*Geneseo*

2018 “Life After Geneseo Biology”, BIO 383: Graduate School and Work

Seminar, *SUNY Geneseo*

Student Mentorship \*co-authored papers †conference presentation/poster

**Graduate Students**

2022-present Edwin Avelar, California State University Dominguez Hills (MS Committee)

**Undergraduate Students**

2023-present I Theresse Voloso, California State University Dominguez Hills

2023-present Andrew Fairclough, California State University Dominguez Hills

2022-present Austin Martinez, California State University Dominguez Hills

2021-2022 †Rachel Miller, Drexel University

2020-2021 Andrew Snedeker, Drexel University

2018-2022 †Serena Joury, Drexel University

2018-2021 \*Purnima Sachdeva, Drexel University

2018-2020 \*†Angelina Gomez, Drexel University

2018-2020 †Devneet Kainth, Drexel University

2017-2020 \*†Cheyenne McNair, Drexel University

2017-2019 \*†Annette Kang, Drexel University

2017-2019 †Sumaiya Zahid, Drexel University

2017-2019 †Michaela Schuster, Drexel University

2018-2019 Rheanna Congdon, Drexel University

2018-2019 †Chandler Olson, Drexel University

2018-2019 Lauren Hultgren, Drexel University

2018-2019 Brandon Garcia, University of Cienfuegos, Cuba

2018 †Zachary Smith, Drexel University

2018 †Margaret McCurdy, Drexel University

2017-2018 †Natalie Carroll, Drexel University

**High School Students**

2018-2020 \*†Sophi Schneider, Philadelphia

K12 Teaching Experience

2019 **Philly Scientists Summer Program (8-11 yo)**

Lecturer and Course Activity Designer, Philly Scientists, PA

2019 **Eureka! Summer Camp for Girls (11-13 yo)**

Workshop Facilitator and Activity Designer, Drexel University, PA

2019 **Elmwood Park Zoo Summer Camp (6-9 yo)**

Activity Leader and Visiting Scientist, Elmwood Park Zoo, PA

2018, 2019 **Huyck Preserve High School Research Program (15-18 yo)**

Lecturer and Field Leader, Huyck Preserve, NY

Posters and Presentations  Δ = award; underline = mentee; bold = presenting

**Invited Talks**

Mar 2023 **Barrett M.** *Bugs on the brain: Sensory evolution and plasticity in insects.*University of

California Riverside, Riverside, CA.

Mar 2023 **Barrett M.** *Insect welfare in farming and research: Ethical challenges for entomologists.* Texas A

& M University, College Station, TX.

Feb 2023 **Barrett M.** *Insect Sentience: should we be concerned for the welfare of insects? A neurobiological perspective.* Insects as mini-livestock workshop, University College Dublin & University of Redding; Animal Welfare Research Network. Virtual.

2022 **Barrett M.** *Animal welfare considerations for farming insects: Ethical challenges for the insects as*

*food and feed industry.* USDA-ARS, Wapato, WA.

2022 **Barrett M.** *The ethical use of insects in research.* Arizona State University Medical Ethics

Club, Tempe, AZ.

2022 **Barrett M.** *External reflectance and thermal tolerance as intraspecific thermoregulatory*

*adaptations in Centris pallida bees.* California State University Long Beach Biology

Seminar, Long Beach, CA.

2022 **Barrett M.** *Dimorphism in UV-NIR reflectance associated with microclimate use in Centris*

*pallida male bees.* International Union for the Study of Social Insects, San Diego, CA.

2022 **Barrett M.** *Variation in external reflectance as a thermoregulatory adaptation in insects.* Urban

Nature Research Center Meeting, Natural History Museum of Los Angeles County,

Virtual.

2021 **Barrett M.** *Found poetry in the primary literature: Communicating beauty and creating new*

*meaning from within familiar scientific works.* Entomological Society of America, Virtual.

2021**Barrett M.** *Bugs on the brain: Sensory evolution and plasticity in bees and wasps.* Sonoma

State University Biology Colloquium, Virtual.

2021 **Barrett M.** *Bugs on the brain: What studying arthropods can tell us about brain evolution.*

California State University Long Beach Biology Seminar, Virtual.

2020 **Barrett M.** *Bugs on the brain: what studying insects teaches us about brain evolution.* Drexel Neuroscience Society, Virtual.

2019 **Barrett M.** *The Mentorship Syllabus: Learning Outcomes for Undergraduate Researchers.*

Entomological Society of America Meeting, St. Louis, MO.

2019 **Barrett M,** O’Donnell S. *Bugs on the brain: what studying insects can teach us about the*

*evolution of the brain.* SUNY Geneseo Research Seminar, Geneseo, NY.

2019 **Barrett M,** O’Donnell S. *Bugs on the brain: what studying insects can teach us about the*

*evolution of the brain.* Pennsylvania State Schuylkill Faculty Research Series, Schuylkill

Haven, PA.

**Talks**

2022 **Barret M,** Chia SY, Fischer B, Tomberlin JK. *Welfare considerations for farming black*

*soldier flies, Hermetia illucens (Diptera: Stratiomyidae): A model for the insects as food and feed*

*industry.* Entomological Society of America, Vancouver, Canada.

2022 **Barrett M,** Fischer B. *Insects as livestock: Challenges at the frontier of agricultural animal*

*welfare.* Applying Ethology Webinar Series, Virtual.

2022 **Barrett M,** Johnson MG. *Declines in Centris pallida head widths over five decades.* BeeCon,

Virtual.

2022 **Barrett M.** *Farmed black soldier fly, Hermetia illucens (Diptera: Stratiomyidae), welfare*

*considerations: A model for the insects as food and feed industry.* Ento22 Conference, Virtual.

2022 **Barrett M.** *Farmed Black Soldier Fly Welfare Considerations.* Insects as Food and Feed

Conference, Virtual.

2022 **Barrett M.** *Morphological and physiological thermoregulatory strategies in Centris pallida male*

*bees utilizing alternative reproductive tactics.* California State University Dominguez Hills

Seminar.

2021 **Barrett M,** O’Donnell S. *Dimorphism in UV-NIR reflectance associated with microclimate use in male bee alternative reproductive tactics.* Animal Behavior Society, Virtual.

2020 **Barrett M,** Buchmann S, O’Donnell S. *Neuroanatomical differentiation supports mate location differences in dimorphic male bees, Centris pallida and Amegilla dawsoni.* Entomological Society of America Meeting, Virtual.

2020 **Barrett M,** O’Donnell S. *Neuroanatomical differentiation associated with alternative mate location strategies in Centris pallida bees.* Animal Behavior Society Virtual Meeting.

2020 **Barrett M,** O’Donnell S. *Neuroanatomical differentiation associated with differential mate*

*location strategies in the brains of dimorphic Centris pallida male bees.* Binghamton Graduate

Student Organization Symposium, SUNY Binghamton, NY.

2019Δ **Barrett M.** *The Mentorship Syllabus: Structuring Learning Outcomes for Undergraduate*

*Researchers.* Scholars Share Drexel, Philadelphia, PA.

Δ Best Presentation Award

2019 **Barrett M.** *Neuroanatomical differentiation associated with alternative mate location strategies in*

*the brains of dimorphic Centris pallida bees.* Evolution in Philadelphia Conference,

Philadelphia, PA.

2019 **Barrett M,** O’Donnell S. *Sensory differentiation in dimorphic males of the desert bee, Centris*

*pallida.* Entomological Society of America Eastern Branch Meeting, Blacksburg, VA.

2019Δ **Barrett M.** *Neuroeconomics: the supply and demand of the social brain.* Entomological

Society of America Eastern Branch Meeting, Blacksburg, VA.

ΔSecond place: Entomological Digest Talks

2018 **Barrett M.** *Morphological and sensory differentiation in males of the desert bee, Centris pallida.*

Social Insects in the North-East Regions Conference, Philadelphia, PA.

2018 **Barrett M,** O’Donnell S. *Size constraints and sensory adaptation in brain architecture (paper*

*wasps- Vespidae: Epiponini).* Entomological Society of America Eastern Branch,

Annapolis, MD.

2017 **Barrett M,** O’Donnell S. *The neuroanatomy of paper wasps: implications for brain evolution*

*and plasticity.* Philadelphia Evolution Group, Philadelphia, PA.

2017**Δ Barrett M,** O’Donnell S. *Caste differences in the mushroom bodies of swarm-founding paper*

*wasps: implications for brain plasticity and brain evolution (Vespidae, Epiponini).* Three Rivers

Evolution Event, Pittsburgh, PA.

Δ American Society of Naturalists Best Lightning Talk Award

2016 **Barrett M,** O’Donnell S. *Introductions to social spider brains.* Social Insects in the North-

East Regions Conference, Washington, DC.

2016 **Barrett M,** Clinton R. *Effects of the Emerald Ash Borer on Nations Road Research Reserve.*

Geneseo Recognizing Excellence, Achievement, and Talent Day, Geneseo, NY.

**Posters**

2022 **Barrett M,** O’Donnell S. *Dimorphism in UV-NIR reflectance associated with microclimate*

*use in Centris pallida male bees.* Entomological Society of America, Vancouver, Canada.

2019 **Δ** **Barrett M,** Caponera V, Schneider S, Congdon R, Sachdeva P, O’Donnell S.

*Neuroanatomical differentiation associated with differential mate location strategies in the brains of*

*dimorphic Centris pallida male bees.* Entomological Society of America, St. Louis, MO.

Δ First Place in Poster Competition

2019 **Barrett M,** Olson C, DeAngelis B, Schneider S, McCurdy M, Joury S, Smith Z,

Thomas R, Machado JAM, Ward DC. *Thermal tolerance and morphology of guard and*

*forager Melipona beecheii in Cienfuegos, Cuba.* Annual International Research Showcase,

Drexel University, PA.

2018 **Barrett M,** O’Donnell S, Bulova S, von Beeren C. *Brain investment under colony-level*

*selection: soldier specialization in Eciton Army Ants.* Evolution in Philadelphia Conference,

Philadelphia, PA.

2018**Barrett M,** Bulova SJ, DeLeon S, Fiocca K, O’Donnell S. *Caste differences in the*

*mushroom bodies of swarm-founding paper wasps.* International Union for the Study of

Social Insects, Guarujá, Brazil.

2018 **Barrett M,** Carroll N, McNair C, O’Donnell S. *Does brain structure covary with sociality in*

*spiders? A comparative test in the genus Anelosimus (Araneae: Theridiidae).* Drexel University

Biodiversity, Earth, and Environmental Sciences Research Symposium, Philadelphia, PA.

2016 **Barrett M,** Carpenter R, Apple J. *Survey of Native Pollinators in the Geneseo Area.*

Geneseo Recognizing Excellence, Achievement, and Talent Day, Geneseo, NY.

2015 **Barrett M,** Apple J. *Determination of Colony Structure in Formica pergandei using*

*Microsatellite Markers to Estimate Worker Relatedness.* COPLAC Northeast Regional

Undergraduate Research, Scholarly and Creative Activity Conference, Mahwah, NJ.

2015 **Barrett M,** Apple J. *Determination of Colony Structure in Formica pergandei using*

*Microsatellite Markers to Estimate Worker Relatedness.* Geneseo Recognizing Excellence,

Achievement, and Talent Day, Geneseo, NY.

2015 **Barrett M,** Apple J. *Determination of Colony Structure in Formica pergandei using*

*Microsatellite Markers to Estimate Worker Relatedness.* Northeast Natural History

Conference, Springfield, MA.

**Co-authored Presentations:**

2020 **Caponera V,** Barrett M, Aviles L, O’Donnell S. *Variations in brain region allocation across a gradient of*

*spider sociality*. Binghamton Graduate Student Organization Symposium, SUNY Binghamton, NY.

2019 **Baudier K,** Bennett M, Barrett M, Fewell JH, Pavlic T. *Neural underpinnings of defense specialization in*

*soldiers of the stingless bee Tetragonisca**angustula.* Entomological Society of America, St. Louis, MO.

2019 **Caponera V,** Barrett M, McNair C, Aviles L, O’Donnell S. *Variations in brain region allocation across a*

*gradient of spider sociality.* Entomological Society of America, St. Louis, MO.

2019 **Ward DC**, Barrett M, Machado JAM. *Structuring meaningful learning outcomes for students engaged in*

*international STEM field experiences.* III Conferencia Científica Internacional de la Universidad de

Cienfuegos, Cienfuegos, Cuba.

2019 **Caponera V**, Barrett M, McNair C, Aviles L, O’Donnell S*. Variations in brain region allocation across a*

*gradient of spider sociality.* Evolution in Philadelphia Conference, Philadelphia, PA.

2019 **Ward DC**, Barrett M, Machado JAM. *Variation in worker caste morphology of Melipona beecheii in Cuba.*

Ecological Society of America Meeting, Louisville, KY.

2019 **Barrett M,** Machado JAM, Ward DC. *Structuring meaningful learning outcomes for students engaged in*

*international STEM field experiences.* Ecological Society of America Meeting, Louisville, KY.

2019 **Kang A,** McNair C, Barrett M, O’Donnell S. *Characterizing the nest partitioning, brood sex allocation, and*

*larval provisions of New York’s solitary, grass-carrying wasp (Isodontia sp).* Entomological Society of America

Eastern Branch Meeting, Blacksburg, VA.

2018 **O’Donnell S**, Bulova S, Barrett M, Fiocca K. *Size and brains: Constraints in the allometry of brain evolution*

*in social insects (Hymenoptera: Vespidae).* Social Insects in the North-East Regions Conference,

Philadelphia, PA.

2018**Caponera V,** Barrett M, O’Donnell S. *Variations in brain resource allocation across a gradient of spider*

*sociality.* Social Insects in the North-East Regions Conference, Philadelphia, PA.

2018 **Ward DC,** Barrett M, Machado JAM. *Ecological investigations of Melipona beecheii in Cienfuegos, Cuba.* II

Conferencia Científica Internacional de la Universidad de Cienfuegos, Cienfuegos, Cuba.

**Co-authored Posters:**

2021 **Miller R,** Barrett M, O’Donnell S. *External sensory systems of Centris pallida bees.* STAR Summer

Showcase, Drexel University.

2019 **McNair C,** Barrett M, Fiocca K, Waddell E, O’Donnell S, Marenda D. *Mannitol ingestion causes sex-*

*biased, concentration-dependent mortality in Drosophila melanogaster.* American Biomedical Research

Conference for Minority Students, Anaheim, CA.

2019**Gomez A,** Barrett M, Caponera V, McNair C, O’Donnell S, Marenda D. *Social transfer and the synergistic*

*effects of erythritol and water stress on mortality in ants (Hymenoptera: Formicidae).* American Biomedical

Research Conference for Minority Students, Anaheim, CA.

2019**Caponera V**, Barrett M, Marenda D, O’Donnell S. *Erythritol ingestion causes concentration-dependent survival*

*reduction in subterranean termites (Reticulitermes: flavipides).* Entomological Society of America, St. Louis,

MO.

2019 **Fiocca K,** Barrett M, Waddell E, Viveiros J, McNair C, O’Donnell S, Marenda D*. Mannitol ingestion*

*causes concentration-dependent, sex-biased mortality in adults of the fruit fly (Drosophila melanogaster).*

Entomological Society of America, St. Louis, MO.

2019 **McNair C**, Barrett M, O’Donnell S, Marenda D. *Concentration-dependent, synergistic effects of erythritol and*

*water stress in ants (Hymenoptera: Formicidae).* Entomological Society of America Eastern Branch Meeting,

Blacksburg, VA.

2019Δ Gomez A, **Kainth D**, Barrett M, Fiocca K, Waddell E, McNair C, O’Donnell S, Marenda D. *D-*

*mannitol ingestion causes concentration-dependent mortality and developmental delay in Drosophila melanogaster.*

Entomological Society of America Eastern Branch Meeting, Blacksburg, VA.

ΔWon second place in the BS/MS competition.

2018 **Olson C,** McCurdy M, Smith Z, Joury S, Schneider S, Thomas R, Márquez S, Barrett M, Machado

JAM, Ward DC. *Variation in worker caste morphology of Melipona beecheii fulvipes bees in Cuba.* II Conferencia

Científica Internacional de la Universidad de Cienfuegos, Cienfuegos, Cuba.

2018**Joury S,**Olson C, McCurdy M, Smith Z, Thomas R, Márquez S, Barrett M, Machado JAM, Ward

DC. *Conditioning Bees in Cuba: assessing the cognitive behavior and color preferences of Melipona*

*beecheii through visual associative learning assays.* II Conferencia Científica Internacional de la Universidad

de Cienfuegos, Cienfuegos, Cuba.

2018**Smith Z,** Joury S,Olson C, McCurdy M, Thomas R, Márquez S, Barrett M, Machado JAM, Ward

DC. *Microhabitat and introduced species’ effects on native bee community structure in Cienfuegos, Cuba.* II

Conferencia Científica Internacional de la Universidad de Cienfuegos, Cienfuegos, Cuba.

2018**McCurdy M,** Smith Z, Joury S, Olson C, Thomas R, Márquez S, Barrett M, Machado JAM, Ward

DC. *Limited thermoregulatory mechanisms in foraging Melipona beecheii bees.* STAR Scholars Summer

Showcase, Philadelphia, PA.

2018 **Olson C**, McCurdy M, Smith Z, Joury S, Schneider S, Thomas R, Márquez S, Barrett M, Machado

JAM, Ward DC. *Variation in worker caste morphology of Melipona beecheii fulvipes bees in Cuba.* STAR

Scholars Summer Showcase, Philadelphia, PA.

2018 **Joury S,**Olson C, McCurdy M, Smith Z, Thomas R, Márquez S, Barrett M, Machado JAM, Ward

DC. *Conditioning Bees in Cuba: assessing the cognitive behavior and color preferences of Melipona*

*beecheii through visual associative learning assays.* STAR Scholars Summer Showcase, Philadelphia, PA.

2018**Smith Z,** Joury S,Olson C, McCurdy M, Thomas R, Márquez S, Barrett M, Machado JAM, Ward

DC. *Microhabitat and introduced species’ effects on native bee community structure in Cienfuegos, Cuba.* STAR

Scholars Summer Showcase, Philadelphia, PA.

2018 **McNair C,** Barrett M, O’Donnell S. *The Pest Relief: Does erythritol act as an insecticide for ants?* Drexel

University Biodiversity, Earth and Environmental Sciences Research Symposium, Philadelphia, PA.

2018**Schuster M,** Zahid S, Barrett M, O’Donnell S. *Do paper wasps have morphological worker subcastes? A test in*

*the neotropical warrior wasp, Synoeca septentrionalis (Hymenoptera: Vespidae).* Drexel University Biodiversity,

Earth, and Environmental Sciences Research Symposium, Philadelphia, PA.

2017 **McNair C**, Barrett M, O’Donnell S. *The Pest Relief: Does erythritol act as an insecticide for ants?* STAR

Scholars Summer Showcase, Philadelphia, PA.

Professional Service

**Departmental/University Committees**

2020-2021 *Biology and BEES Graduate Student Association Diversity, Equity, and Inclusion*

*Ad-hoc Committee Member*, Drexel University

+ Founder/Facilitator of the Diversity, Equity, and Liberation Learning Community for Graduate Students and Postdocs

2020-2021 *Biology Department Diversity, Equity, and Inclusion Ad-hoc Committee Member,*

Drexel University

2020 *Strategic Planning Focus Committee,* Drexel University

2019 *Department Scientific Retreat Committee,* Biology Department, Drexel University

2016 *Curriculum Committee Member,* Geneseo Learning Outcomes for Baccalaureate

Education (GLOBE), SUNY Geneseo

**Workshops and Panels**

2023 *Planning a CSU-wide Postdoctoral Research Community,* Organizer; CSUDH Department

of Research

2023 *Biological Research Ethics,* Organizer; CSUDH Office of Undergraduate Research

2023 *Research and Writing Skills,* Organizer; CSUDH Office of Undergraduate Research

2022 *Finding and Supporting STEM Postdocs at CSUDH Workshop*, Organizer;CSUDH Faculty Development Center

2022 *Grant Writing Workshop,* Organizer; IUSSI 2022 + EntoPOC, San Diego

2022 *Networking Panel,* Organizer;IUSSI 2022 + EntoPOC, Virtual

2021 *STEM Pedagogy and Career Paths,* Panelist; Drexel University

2020\**The Mentorship Syllabus: Planning for undergraduate researcher learning and success,* Organizer;Entomological Society of America Meeting, Virtual.

\*invited workshop, co-led with Dr. Jonathan Koch

2019-2020 *Multiple Student Workshops,* Organizer; Louis Stokes Alliances for Minority Participation (LSAMP), Drexel University

**Volunteer Service**

2022 *Student Mentor,* IUSSI 2022

2020 *Student Mentor,* EntoPOC (for Entomological Society of America 2020)

2020 *Competition Judge,* pollinator protection research contest, high and middle school,Army Educational Outreach Program

2020 *Travel Scholarship Reviewer,* Society for the Advancement of Chicanos/Hispanics and Native Americans in Science

2017-2019 *Volunteer Teaching Leader,* Teaching Assistant Task Force,Drexel University

2018 *Volunteer Judge,* Drexel STAR Summer Showcase, Philadelphia

2018 *Head Judge*, George Washington Carver Science Fair,Philadelphia

2017 *Volunteer Interviewer*, DrEAMS program, Drexel University

**Student Leadership**

2017-2020 *Biology and BEES Graduate Student Association,*Drexel University

- 2017-2018: *Treasurer*; 2018-2019: *President*; 2019-2020: *Vice*

*President for Biology*

- While President, BGSA won the 2019 Graduate Community Impact

Award from the Graduate College

**Peer Reviewer:** *Animal Welfare* (1),*Behavioral Ecology* (1), *Ecological Entomology* (1), *Insectes Sociaux* (1)*, Journal of Economic Entomology* (1), *Journal of Entomological Education and Outreach* (1), *Journal of Insects as Food and Feed* (1), *Papéis Avulsos de Zoologia* (1)

**Symposium Organization**

2022 Insect Welfare in Farmed, Wild, and Research Contexts; co-organized with Bob

Fischer; Entomological Society of America 2022, Vancouver

**Conference Organization**

2019-2022 Chair of the Graduate and Postdoc Committee &

Member of the Executive Committee for the 2022 International Union for the

Study of Social Insects, San Diego

2019 Executive Committee, Evolution in Philadelphia Conference, Philadelphia

2018 Executive Committee, Evolution in Philadelphia Conference, Philadelphia

2018 Executive Committee, Social Insects in the North-East Regions Conference,

Philadelphia

Science Communication

**Scientific Outreach Events**

2018, 2019 **Scientist Saturday Program (all ages)**

Visiting Scientist, Academy of Natural Sciences, PA

2018 **Phoenix March for Science (all ages)**

Meet and Greet Scientist with the Arizona State University Social Insect

Research Group, Phoenix, AZ

**Scientific Outreach Talks**

Oct 2022 Barrett M. *Farmed Insect Welfare.* Open Philanthropy, Staff Retreat.

Sept 2022 Barrett M. *Insects. Big Yikes.* Rethink Priorities, Staff Retreat.

Sept 2020 Barrett M, Ward DC. *Problems facing our pollinators.* Army Educational Outreach Program, Virtual.

Feb 2020 Barrett M. *The Insect Apocalypse: Diversity, Function, and Importance of Insects.* Timeular Retreat, USA.

Nov 2019 Barrett M. *Who’s there? Opportunistic natural history research on Isodontia auripes wasps at the*

*Huyck Preserve.* Huyck Preserve 80th Anniversary Research Celebration,

Rensselearville, NY.

Aug 2018 Barrett M. *Altruism, Relatedness, and Sociality: Unraveling the Evolutionary Story of the ‘Hive*

*Mind’ in Bees.* Huyck Preserve Thursday Night Lecture Series, Rensselearville, NY.

**Science Communication Online**

*Scientist podcast guest*

2020: ArthroPod

2019: BugScope

2018: PhDrinking; Superwomen in Science; School of Batman

*Science Writing:* PlanetBee; Buzz, Hoot, Roar; Rapid Ecology; Faces of Fieldwork; Go Beyond;

The Female Scientist; Biotweeps; EA Forum; The Huyck Preserve newsletter

**Creative Writing Science Publications**

* *Experimental Ambiguity,*a play, published in *Gandy Dancer Magazine;* performed by the Young, Open and Honest Players of Penfield in 2012 and expanded version performed as an Educational Theater Workshop at SUNY Geneseo in 2016
* Biological poetry published in *Palaver Magazine, The Trumpeter, Mind Murals Magazine, Five:2:One Magazine, The Waggle, Crab Fat Magazine, Gandy Dancer Magazine, Firefly Magazine, Frankenstein's Review, UnLost Magazine, all the sins, Eyedrum Periodically,*and *The Slag Review*

Public Coverage of Research

* **2023,** [***The Scientist***](https://www.the-scientist.com/news-opinion/animals-are-shape-shifting-in-response-to-a-warming-world-70869)– covered *Centris pallida* body size declines research
* **2022,** [***Insectes Sociaux***](https://link.springer.com/article/10.1007/s00040-022-00885-1)– editorial covering termite neuroanatomy research
* **2022,** [***Buzzing Newsletter***](https://buzzing.substack.com/p/buzzing-insect-welfare?s=r)*–*covered black soldier fly welfare research
* **2022, *Bee Craft Magazine*** – covered black soldier fly welfare research (print)
* **2019,** [***The Triangle***](https://www.thetriangle.org/news/students-study-bees-culture-in-cuba/)– covered *Melipona beecheii* research
* **2019,** [***Exel Magazine***](https://exelmagazine.org/article/bees-in-heat/)– covered *Centris pallida* thermoregulation research
* **2019,** [**Food and Wine**](https://www.foodandwine.com/lifestyle/melipona-honey-yucatan-mexico)– covered *Melipona beecheii* research
* **2018,** [**NPR**](https://www.npr.org/sections/thesalt/2018/11/14/661814847/mexicos-endangered-stingless-bees-mysteriously-find-a-sweeter-home-in-cuba?utm_campaign=storyshare&utm_source=twitter.com&utm_medium=social)– covered *Melipona beecheii* research