PHILLIP BARDEN

NEW JERSEY INSTITUTE OF TECHNOLOGY
DEPARTMENT OF BIOLOGICAL SCIENCES
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CURRENT POSITION

Assistant Professor, tenure track — 2017 - present
New Jersey Institute of Technology, Federated Department of Biological Sciences

EDUCATION

PH.D. American Museum of Natural History, Richard Gilder Graduate School — 2010 - 2015
Comparative Biology *Advisor David Grimaldi*

B.S. Arizona State University, School of Life Sciences — 2005 - 2009
Ecology & Evolution *Advisor Jennifer Fewell*

PUBLICATIONS

(ADVISEE AUTHORS: ^POSTDOCTORAL ‡GRADUATE STUDENT *UNDERGRADUATE)

39. Sosiak, C.E. ‡, Janovitz, T., Perrichot, V., Timonera, J.P., **Barden, P.** Preprint & Accepted. Trait-based paleontological niche prediction reveals deep time ecological succession in specialized ant predators. *American Naturalist* / *bioRxiv* 2022.06.09.495514

38. Sawh, I. ‡, Bae, E.*, Camilo, L., Lanan, M., Lucky, A., Menezes, H.M., Fiorentino, G. ‡, Sosiak, C. ‡, Khadempour, L. **Barden, P.** Preprint & in press. The first fossil replete ant worker establishes living food storage in the Eocene. *Myrmecological News* / *bioRxiv* 2022.12.15.520604.

37. Wilson, M.M., Emam, A., Davis, S.R., Hall, G., **Barden, P.**, Ware, J.L. 2023. Description of a novel termite ectoparasite, *Termitaria hexasporodochia* sp. nov. (Kathistaceae), presenting an unusual six-sectioned infestation, and a key to the fungal family Kathistaceae. *Phytotaxa* 591(2): 106-124.

36. Fiorentino, G.‡, Lattke, J., Troya, A., Sosiak, C.E. ‡, Dong, M., **Barden, P.** 2023. Deep time extinction of largest insular ant predators and the first fossil *Neoponera* (Formicidae: Ponerinae) from Miocene age Dominican amber. *BMC Biology, 21, 26*.

35. Sosiak, C.E.‡, Borowiec, M.L., **Barden, P.** 2022. Retracted: An Eocene army ant. *Biology Letters*, 18(11): 20220398. [Retracted *see* Sosiak, C.E.‡, Borowiec, M.L., **Barden, P.** 2023 Retraction: An Eocene army ant. *Biology Letters* 1920230059]

34. Clark, A.T., D'Anna, S., Nemati, J., **Barden, P.**, Gatley, I., Federici, J. 2022. Evaluation of Fossil Amber Birefringence and Inclusions Using Terahertz Time-Domain Spectroscopy. *Polymers*, 14(24): 5506.

33. Engel, M., Herhold, H.W., **Barden, P.** 2022. A proctotrupid wasp in Lebanese Lower Cretaceous amber (Hymenoptera: Proctotrupidae). *Palaeoentomology* 5(5): 439-444.

32. **Barden, P.** Sosiak, C.E.‡, Grajales, J., Hawkins, J., Rizzo, L., Clark, A., Gatley, S., Gatley, I., Federici, J. 2022. Non-destructive comparative evaluation of fossil amber using terahertz time-domain spectroscopy. *PLoS One* 17(3): e0262983

31. Mapalo, M., Robin, N. ^, Boudinot, B.E., Ortega-Hernández, J., **Barden, P.** 2021. A Tardigrade in Dominican Amber. *Proceedings of the Royal Society B* 288: 20211760

30. Engel, M.S., Ceríaco, L.M., Daniel, G.M., Dellapé, P.M., Löbl, I., Marinov, M., Reis, R.E., Young, M.T., Dubois, A., Agarwal, I., Lehmann A, P., Alvarado, M., Alvarez, N., Andreone, F., Araujo-Vieira, K., Ascher, J.S., Baêta, D., Baldo, D., Bandeira, S.A., **Barden, P.**, Barrasso, D.A. et al. 2021. The taxonomic impediment: a shortage of taxonomists, not the lack of technical approaches. *Zoological Journal of the Linnean Society 193*: 381-387.

29. Jelley, C. *, **Barden, P.** 2021. Vision-linked traits associated with antenna size and foraging ecology across ants. *Insect Systematics and Diversity* 5: 9, 1-10

28. Wilson, M., **Barden, P.**, Ware, J.L. 2021. A review of the ectoparasitic fungi associated with termites. *Annals of the Entomological Society of America* 114: 373-396.

27. Ennis, C.C., Nariah N. Haeffner, N.N., Keyser, C.D., Leonard, S.T., Macdonald-Shedd, A.C., Savoie, A.M., Cronin, T.J., Veldsman, W.P., **Barden, P.**, Chak, S.T.C. ^, Baeza, J.A. 2021. Comparative mitochondrial genomics of sponge-dwelling snapping shrimps in the genus *Synalpheus*: exploring differences between eusocial and non-eusocial species and insights into phylogenetic relationships in caridean shrimps. *Gene* 786: 145624.

26. Sosiak, C.E.‡ & **Barden, P.** 2021. Multidimensional trait morphology predicts ecology across ant lineages. *Functional Ecology* 35: 139-152.

25. Chak, S.T.C. ^, Baeza, J.A., & **Barden, P.** 2021. Eusociality shapes convergent patterns of molecular evolution across mitochondrial genomes of snapping shrimps. *Molecular Biology and Evolution* 38: 1372-1383.

24. **Barden, P.**, Perrichot, V., Wang, B. 2020. Specialized predation drives aberrant diversity in the earliest ants. *Current Biology* 30: 3818-3824.

23. Chak, S.T.C. ^, **Barden, P.***, Baeza, J.A*. 2020. The complete mitochondrial genome of the eusocial sponge-dwelling snapping shrimp *Synalpheus microneptunus*. *Scientific Reports* 10: 7744. [*equal contribution]

22. Tribull, C.M, **Barden, P.**, Olmi, M. 2020. *Hybristodryinus moutesoe* (Hymenoptera, Dryinidae), a new species from mid-Cretaceous Kachin (Burmese) amber. *Cretaceous Research* 114: 104528.

21. **Barden, P.** 2020. Extinction through ancient compound eyes. *American Entomologist* 66: 64. [invited; not peer reviewed]

20. Perrichot, V., Wang, B., **Barden, P.** 2020. New remarkable hell ants (Formicidae: Haidomyrmecinae stat. nov.) from mid-Cretaceous amber of northern Myanmar. *Cretaceous Research* 109: 104381.

19. **Barden, P.** & Engel, M.S. 2020. Fossil social insects. In *Encyclopedia of Social Insects*, ed. Starr C.K. *Springer International*, Cham, Switzerland. [invited]

18. Robin, N. ^, D'Haese, C., & **Barden, P.** 2019. Fossil amber reveals springtails' longstanding dispersal by social insects. *BMC Evolutionary Biology* 19(213): 1-12.

17. Lapolla, J.S. & **Barden, P.** 2018. A new aneuretine ant from the Paleocene Paskapoo Formation of Canada. *Acta Palaeontologica Polonica* 63: 435-440. ["Editor's Choice"]

16. Grimaldi, D.A., Sunderland, D., Aaroe, G.A., Depsky, M.R., Parker, N.E. Tillery, G.Q., White, J.G., **Barden, P.**, Nascimbene, P.C., & Williams, C.J. 2018. Biological inclusions in amber from the Paleogene Chickaloon Formation of Alaska. *American Museum Novitates* 3908: 1-37.

15. Katzke J., **Barden P.**, Dehon M., Michez D., Wappler T. 2018. Giant ants and their shape: revealing relationships in the genus *Titanomyrma†* with geometric morphometrics. *PeerJ* 6: e424 1-36.

14. **Barden, P.**, Boudinot, B.E. & Lucky, A. 2017. Where fossils dare: combined morphological and molecular analysis illuminates the tangled history of the spider ant genus *Leptomyrmex* Mayr (Hymenoptera: Dolichoderinae). *Invertebrate Systematics* 31: 765-780.

13. **Barden, P.** & Ware, J.L. 2017. Relevant relicts: the impact of fossil distributions on biogeographic reconstruction. *Insect Systematics and Diversity* 1: 73-80. [invited]

12. **Barden, P.**, Herhold, H.W. & Grimaldi, D.A. 2017. A new genus of hell ants from the Cretaceous (Hymenoptera: Formicidae: Haidomyrmecini) with a novel head structure. *Systematic Entomology* 42: 837-846.

11. **Barden, P.** 2017. Fossil ants (Hymenoptera: Formicidae): ancient diversity and the rise of modern lineages. *Myrmecological News* 14: 1-30. [invited]

10. **Barden, P.** & Grimaldi, D.A. 2016. Adaptive radiation in socially advanced stem-group ants from the Cretaceous. *Current Biology* 26(4): 515-521. [Cover Article with #9]

9. Engel, M.S., **Barden, P.**, Riccio, M. & Grimaldi, D.A. 2016. Morphologically Specialized Termite Castes and Advanced Sociality in the Early Cretaceous. *Current Biology* 26(4): 522-530.

8. Ware, J.L. & **Barden, P.** 2016. Incorporating fossils into hypotheses of insect phylogeny. *Current Opinion in Insect Science* 18: 69-76. [invited]

7. Grimaldi, D.A. & **Barden, P**. 2016. The Mesozoic family Eremochaetidae (Diptera: Brachycera) in Burmese amber and relationships of Archisargoidea. *American Museum Novitates* 3865: 1-29.

6. Arillo, A., Grimaldi, D., Peñalver, E., Pérez-de la Fuente, R., Delclòs, X., Criscione, J., **Barden, P.**, & Riccio, M. 2015. Long-proboscid Brachyceran flies in Cretaceous amber (Diptera: Stratiomyomorpha: Zhangsolvidae). *Systematic Entomology* 40(1): 242-267.

5. **Barden, P.** & Grimaldi, D. 2014. A diverse ant fauna from the mid-Cretaceous of Myanmar (Hymenoptera: Formicidae). *PLoS One* 9(4): e93627.

4. Payne, A., **Barden, P.**, Wheeler, W. & Carpenter, J.M. 2013. Direct optimization, sensitivity analysis, and the evolution of the hymenopteran superfamilies. *American Museum Novitates* 3789: 1-20.

3. **Barden, P.** & Grimaldi, D. 2013. A new genus of highly specialized ants in Cretaceous Burmese amber (Hymenoptera: Formicidae). *Zootaxa* 3681(4): 405-412.

2. **Barden, P.** & Grimaldi, D. 2012. Rediscovery of the bizarre Cretaceous ant *Haidomyrmex* Dlussky (Hymenoptera: Formicidae). *American Museum Novitates* 3755: 1-16.

1. Holbrook, C.T., **Barden, P.M.** & Fewell, J.H. 2011. Division of labor increases with colony size in the harvester ant *Pogonomyrmex californicus*. *Behavioral Ecology* 22(5): 960-966.

RESEARCH FUNDING AWARDED [~$1,700,000 TOTAL]

2023-2026 National Science Foundation (DEB 2306958) "Uncovering eusocial pathways and consequences: Phylogenomics, morphological, and molecular evolution in *Synalpheus* snapping shrimps" Collaborative Proposal with Solomon Chak (Denison University) [$474,300 to PI: Barden]

2022-2027 National Science Foundation (DEB 2144915) "CAREER: Fossil Amber Insight Into Macroevolutionary Dynamics in an Ecologically Diverse Island System" [$928,381 to PI: Barden]

2019-2020 Paleontological Society, Arthur James Boucot Research Grant, "Amber insights into Caribbean extinction, stasis, and niche evolution with ant morphometrics" [$3,300]

2018-2019 New Jersey Institute of Technology, Seed Grant, "An interdisciplinary approach in data extraction and outreach: spectroscopy and industrial design with fossil amber" [$10,000] PI: Barden; co-PIs: John Federici, Martina Decker

2015-2017 National Science Foundation, (DBI 1523788), Postdoc Fellowship, "Fossils in the age of genomics: a case study of ants (Hymenoptera: Formicidae) and amber" [$138,000 to PI: Barden]

2013-2015 National Science Foundation, DEB 1313547, "Dissertation Research: A Total Evidence Phylogeny of the Ants" [$15,557 to PI: David Grimaldi; co-PI: Barden]

2012-2015 National Science Foundation, Graduate Research Fellowship 131549 [$134,000]

AWARDS, HONORS, & FELLOWSHIPS

2022	Elected Fellow of the Royal Entomological Society
2022	New Jersey Institute of Technology, College of Science & Liberal Arts, Rising Star Research Award [sole annual recipient]
2021	New Jersey Institute of Technology, Excellence in Teaching Award, Lower Division Undergraduate Instruction by Tenured/Tenure Track Faculty [sole annual recipient]
2016	Entomological Society of America, Snodgrass Morphology Award [sole annual recipient]
2013	Entomological Society of America, Student Travel Award
2011	Ford Foundation, Predoctoral Fellowship Honorable Mention
2010	American Museum of Natural History, Richard Gilder Graduate School Fellowship
2009	Arizona State University, Howard Hughes Medical Institute funded School of Life Sciences Undergraduate Researcher Fellowship
2008	Arizona State University, Travel Grant
2007	Arizona State University, National Institutes of Health funded Minority Access to Research Careers (MARC) Fellowship

COURSE INSTRUCTION

New Jersey Institute of Technology

BIOL 622: Graduate Evolution	Fall ’22
BIOL 698: Graduate Ecology	Fall ’20, ’21
BIOL 320: Discovering Biological Research	Fall ’17
BIOL 205: Foundations of Biology: Ecology and Evolution (Honors)	Spring ’18, ’19, ’20, ’22, ‘23
BIOL 205: Foundations of Biology: Ecology and Evolution	Fall ’18

Other Institutions

Graduate course: Social Evolution and Behavior (Instructor, Rockefeller University)	Summer ‘22
BIO 485: Evolution (Adjunct Assistant Professor, CUNY: City College of New York)	Summer ’15
Principles of CT-Scanning (Instructor, American Museum of Natural History)	Summer ’12
EEEB 3915: Comparative Social Evolution (Teaching Assistant, Columbia University)	Spring ’12

OTHER ACADEMIC POSITIONS HELD

Research Associate American Museum of Natural History	2017 - present
National Science Foundation Postdoctoral Fellow Rutgers University *Sponsor Jessica Ware*	2015 - 2017
Adjunct Assistant Professor CUNY: City College of New York	Summer 2015
Graduate Research Fellow American Museum of Natural History	2010 - 2015
Teaching Assistant Columbia University	Spring 2012
NSF REU Fellow American Museum of Natural History	Summer 2009
Research Training Program Fellow Smithsonian National Museum of Natural History	Summer 2008
Lab Technician & Undergraduate Researcher Arizona State University	2007 - 2010

INVITED PRESENTATIONS [2017-PRESENT]

2023 Segundo Simposio Iberoamericano de Mirmecología
Virtual. May 6, Occasional International Meeting.
Rutgers-Newark Department of Earth & Environmental Science Seminar
Newark, NJ. March 29, Departmental Seminar.
Cornell University Entomology Seminar
Ithaca, NY. January 26, Departmental Seminar.

2022 George Washington University Biology Seminar
Washington, DC. October 21, Departmental Seminar.
XXVI International Congress of Entomology
Helsinki – Finland. July 19, Quadrennial Meeting, Remote talk.
Finnish Museum of Natural History / University of Helsinki LUOMUS Seminar
Helsinki – Finland. March 16, Seminar Series, Virtual.

2021 Asociación Dominicana de Estudiantes de Biología Symposium
Santo Domingo – Dominican Republic. July 20, Conference Series, Virtual.
Macquarie University Biology Seminar
Sydney – Australia. May 25, Departmental Seminar, Virtual.
Georgia Southern University Biology Seminar
Statesboro – Georgia. February 1, Departmental Seminar, Virtual.

2020 Entomological Society of America Meeting
Virtual. November 11-25, Annual Meeting, Talk and panel.
Entomological Society of America Webinar
Virtual. September 17, Webinar: Incorporating Entomological Research in the Classroom, Talk and panel.
University of Kansas Biology Seminar
Lawrence – Kansas. September 8, Departmental Seminar, Virtual.

2019 SUNY Farmingdale Biology Seminar
Farmingdale - New York. December 5, Departmental Seminar.
NJIT Math Biology Seminar
Newark - New Jersey. October 22, Departmental Seminar.
North Carolina State University Mike Duke Seminar in Entomology
Raleigh - North Carolina. October 18, Annual Invitational Seminar.
Harvard University Museum of Comparative Biology Seminar
Cambridge – Massachusetts. July 24, Seminar Series.
North American Paleontological Convention
Riverside – California. June 27, Quadrennial Meeting, Talk.
Smithsonian National Museum of Natural History Phylopizza Seminar
Washington, DC. June 11, Monthly Seminar.
Rutgers University-Camden Biology Seminar
Camden - New Jersey. March 28, Departmental Seminar.
Entomological Society of America Eastern Branch Meeting
Blacksburg – Virginia. March 10, Annual Meeting, Talk.
Columbia University Seminar: The Integrative Study of Animal Behavior
New York City - New York. January 28, Occasional Seminar Series.

2018 Entomological Society of America Meeting
Vancouver - British Columbia. November 13, Annual Meeting, Talk.
University of Alabama Birmingham Sigma Xi Seminar
Birmingham – Alabama. October 18, Department of Biology Series.
111th Meeting of the German Zoological Society
Griefswald – Germany. September 12, Annual Meeting. Keynote.
University of Illinois at Urbana-Champaign Entomology Seminar
Urbana-Champaign – Illinois. April 9, Departmental Seminar
Advances in imaging, quantifying, and understanding the evolution of ant phenotypes
Okinawa – Japan. March 26, Okinawa Institute of Science and Technology Symposium. Talk.

2017 23rd Simpósio de Mirmecologia
Curitiba – Brazil. October 26, Biennial Meeting, Talk and roundtable.
8th Dresden Meeting on Insect Phylogeny
Dresden – Germany. September 23, Biennial Meeting, Talk.

CONTRIBUTED AND STUDENT-LED PRESENTATIONS [2013-PRESENT]

(ADVISEES: ^POSTDOCTORAL ‡GRADUATE STUDENT *UNDERGRADUATE #HIGH SCHOOL; AWARDS NOTED)

2023 Dana Knox Student Research Showcase
April 19, Annual Student Symposium, Newark - NJ
Ahmed, J.*, Fiorentino, G ‡. & **Barden, P.** Niche Preference and Mandibular Specialization in Ants. Poster. **[Won award]**

2022 Entomological Society of America Meeting
November 13-16, Annual Meeting, Vancouver - British Columbia, Canada
Sosiak, C.E. ‡, **Barden, P**. Resin from the dead: Evaluating patterns in extinction through the ant fossil record. Juried showcase talk.

Barden, P., Calamari, Z., Vida, T*. Increasing social insect prevalence in the Cenozoic precipitated convergent dietary specialization among mammals. Talk

Society of Vertebrate Paleontology Meeting
November 2-5, Annual Meeting, Toronto – Ontario, Canada
Z.T. Calamari, C.E. Finck, J. Julius, G. Droznik, **P. Barden.** Did abundant ants lead to abundant Anteaters? Assessing the link between ant and termite abundance and the diversity of obligate myrmecophages in extinct and extant Xenarthra. Talk.

Evolution Meeting
June 21-28, Annual Meeting, Cleveland – Ohio
Barden, P., Perrichot, V., Wang, B. Specialized predation drives aberrant morphological integration and diversity in the earliest ants. Virtual talk.

Sosiak, C.E. ‡, **Barden, P**. Trait-based paleontological niche prediction suggests ecological turnover across the KPg boundary in predatory ants. Virtual talk.

Fiorentino, G. ‡, **Barden, P**. The first fossil tiger ant of the genus *Neoponera* (Ponerinae: Formicidae). Virtual talk.

Sawh, I. ‡, **Barden, P.**, Khadempour, K. Tracing the Origins of Repletism and Identifying the Honeypot Ant Gut Microbiota. Poster.

10th Social Insects in the North East Regions Conference
June 4, Occasional Regional Meeting, Newark – New Jersey
Barden, P. Fossil Social Insects. Talk.

Fiorentino, G. ‡, **Barden, P**. The first fossil tiger ant of the genus *Neoponera* (Ponerinae: Formicidae). Talk.

Sosiak, C.E. ‡, **Barden, P**. Stark faunal turnover and long fuse replacement across the late Cretaceous ant fossil record. Talk.

Sawh, I. ‡, **Barden, P.**, Khadempour, K. Tracing the origins of repletism and identifying the honeypot ant gut microbiota. Talk.

American Society for Microbiology Theobald Smith Society Spring Symposium
May 25, Annual Meeting, Piscataway – New Jersey
Sawh, I. ‡, **Barden, P.**, Khadempour, K. Tracing the Origins of Repletism and Identifying the Honeypot Ant Gut Microbiota. Poster.

2021 Entomological Society of America Meeting
Oct 31-Nov 5, Annual Meeting, Denver – Colorado
Sosiak, C.E. ‡, **Barden, P**. Trait-based paleontological niche prediction suggests ecological turnover across the KPg boundary in predatory ants. Talk. **[Won award]**

Fiorentino, G. ‡, **Barden, P**. The first fossil tiger ant of the genus *Neoponera* (Ponerinae: Formicidae). Talk.

Barden, P., Engel, M.E. Fossil Social Insects. Virtual Talk.

Dana Knox Student Research Showcase
April 21, Annual Student Symposium, Newark - NJ
Shah, N.*, & **Barden, P.** Quantifying the Morphological Similarity between Social Parasites and their Hosts. Poster **[Won award]**

2020 Entomological Society of America Meeting
November 11-25, Annual Meeting, Virtual
Sosiak, C.E. ‡, **Barden, P**. Resolving fossil insects in amber for systematics and outreach. Invited talk.

Fiorentino, G. ‡, Tocora, M.C., Castro, D., Fernández Castiblanco, F., **Barden, P.** Gazing into the Colombian Amazon ant diversity: Advances and perspectives in a war-torn country. Infographic/Poster.

Wilson, M. ‡, **Barden, P.**, Ware, J.L. A review of the ectoparasitic fungi that infect termites. Talk.

Jelley, C.M.*, & **Barden, P.** Foraging ecology is linked to morphological variation of the eye across ant lineages. Talk.

Shah, N.*, & **Barden, P.** Quantifying the morphological similarity between social parasites and their hosts. Talk. **[Won award]**

Rivera, M., **Barden, P.**, Suarez, A. The evolution of worker body size and polymorphism in ants. Talk.

Boudinot, B.E., Khouri, Z., Richter, A., van de Kamp, T., **Barden, P.**, Perrichot, V., Chaul, J. Morphological insights into the evolution of eusociality in Formicidae. Talk.

NJIT Department of Biological Sciences Research @ Home Symposium
September 9, Annual Symposium, Newark – New Jersey
Reyes, X.*, & **Barden, P.** The Effect of Land Area on Ecological Niches: A study of ants and islands. Talk.

NJIT Honors Summer Research Institute Conference
July 30, Annual Symposium, Newark – New Jersey
Shah, N.* & **Barden, P.** Models of Parasitism: Quantifying the Morphological Evolution Between Social Parasites and their Hosts. Talk

Pugliese, A.D.*, **Barden, P.**, Chak, S.T.C.^ Using Long-Read Sequencing to Assemble Genomes with Repetitive DNA: A Simulation Study. Talk.

2019 Entomological Society of America Meeting
November 19, Annual Meeting, St. Louis - Missouri
Barden, P. Deep time extinction, stasis, and island biogeography in the Caribbean revealed by fossil amber. Talk.

Sosiak, C.‡ , & **Barden, P.** Exploring ancient hellscapes: Comparing morphology of Cretaceous haidomyrmecines and extant ants to predict early ant ecological niches. Talk. **[Won award]**

Jelley, C.* , & **Barden, P.** Ecological variation in ant eyes. Talk. **[Won award]**

Gonzalez, L.‡ , **Barden, P.**, Ware, J. Analyses of shape within a highly variable treehopper lineage (Hemiptera: Membracidae). Talk.

NJIT Provost High School Summer Research Symposium
August 5, Annual Symposium, Newark - New Jersey
Chen, A.[#], & **Barden, P.** Study of the correlation between ant eye size and ecology. Poster.

NJIT 12th International Undergraduate Summer Research Symposium
August 1, Annual Symposium, Newark - New Jersey
Pugliese, A.*, & **Barden, P.** Satellite Imagery of Insect Structures: Insights into Global Ecological Declines. Poster.

Reyes, X.*, & **Barden, P.** The Effect of Land Area on Ecological Niches: A study of ants and islands. Poster.

10th International Seminar on Apterygota
June 19, Quadrennial Meeting, Paris - France
Robin, N. ^, **Barden, P.,** & D'Haese, C.A. Fossil amber reveals springtails' longstanding dispersal by social insects. Talk.

Dana Knox Student Research Showcase
April 17, Annual Student Symposium, Newark - NJ
Siraj, A.*, & **Barden, P.** Observing Morphological and Ecological Evolution over 20 million years through ants and amber. Poster.

International Congress of Entomology
April 8, Triennial Meeting, Santo Domingo - Dominican Republic
Barden, P. Dominican Amber reveals local extinction, stasis, and community evolution in ants. Talk.

Sosiak, C. ‡, **Barden, P.**, Soto-Centeno, J.A. Where the hell ants roamed: predicting Mesozoic ant biogeography throughout the Cretaceous. Talk.

Robin, N.^, D'Haese, C., **Barden, P.** Springtails on eusocial insects: an ancient hitchhiking tale. Poster.

NJIT President's Forum and Faculty Research Showcase
April 2, Annual Symposium, Newark – New Jersey
Barden, P., Federici J.F., Decker, M. An interdisciplinary approach in data extraction and outreach: spectroscopy and industrial design with fossil amber. Poster.

Wilson, W.M.‡, Davis S., **Barden, P.** & Ware, J. Mirroring the honeybees: The first account of a wax gland system in termites. Poster.

2018 Social Insects in the North East Regions Conference
December 8, Occasional Regional Meeting, Philadelphia - Pennsylvania
Robin, N. ^, & **Barden. P.** Tracking 100 million years of biological symbiosis in fossil termites. Talk.

Sosiak, C. ‡, & **Barden. P.** What is a hell ant? Comparisons of Cretaceous and extant trap-jaws to evaluate ancient ecological niches. Talk.

Entomological Society of America Meeting
November 13, Annual Meeting, Vancouver - British Columbia, Canada
Sosiak, C. ‡, & **Barden, P.** Differential success in ant (Hymenoptera: Formicidae) lineages at the end of the age of the dinosaurs. Poster. **[Won award]**

Jelley, C.*, & **Barden. P.** Revealing trade-offs in sensory organs and morphological traits of ants (Hymenoptera: Formicidae). Digital poster.

NJIT Provost High School Summer Research Symposium
August 3, Annual Symposium, Newark - New Jersey
Chen, A.[#], & **Barden, P.** Taxonomic Morphometric Analyses between Dominican Amber and Extant Ants Present on Hispaniola. Poster. [**won Regeneron top scholar award** for project; results published in Columbia Junior Science Journal]

NJIT 11th International Undergraduate Summer Research Symposium
July 27, Annual Symposium, Newark - New Jersey
Jelley, C.*, & **Barden, P.** Revealing Trade-offs in Sensory Organs and Morphological Characteristics of Formicidae. Poster.

Siraj, A.*, & **Barden, P.** Observing Morphological and Ecological Evolution over 20 million years through ants and amber. Poster.

NJIT President's Forum and Faculty Research Showcase
March 28, Annual Symposium, Newark - New Jersey
Jelley, C.*, & **Barden, P.** Paleontology and comparative genomics as windows into evolution and sociality. Poster.

2017 Entomological Society of America Meeting
November 6, Annual Meeting, Denver - Colorado
Guzman, C.*, Ware, J.L. & **Barden, P.** Population structure of *Nasutitermes* in Karanambu, Guyana. Poster.

Louis-Stokes Minority Participation Meeting
October 13, Annual Meeting, Union - New Jersey
Guzman, C.*, Ware, J.L. & **Barden, P**. Population structure of *Nasutitermes* in Karanambu, Guyana. Poster. **[Won award]**

2016 Louis Stokes Alliances for Minority Participation Poster Session
October 7, Annual Meeting, New Brunswick - New Jersey
Macazana, C.*, Van Aken, T., Mayur, K, Ware, J.L. & **Barden, P.** Observing the effects of recurrent flooding on the composition of eusocial insects in Guyana. Poster.

International Congress of Entomology
September 26, Triennial Meeting, Orlando - Florida
Barden, P. & Ware, J.L. A tale of two datasets: consilient approaches toward detailing the evolutionary history of ants (Hymenoptera: Formicidae). Talk.

International Conference on Fossil Insects, Arthropods and Amber
April 28, Triennial Meeting, Edinburgh - UK
Barden, P., Ware, J.L. & Grimaldi, D. The ants (Hymenoptera:Formicidae) of early Eocene Indian amber. Talk.

2015 Willi Hennig Society Meeting
June 29, Annual Meeting, New York City - New York
Barden, P., Boudinot, B.E. & Lucky, A. Paleontological evidence elucidates the biogeographic history of the dolichoderine ant genus *Leptomyrmex* Mayr. Talk.

2014 Entomological Society of America Meeting
November 19, Annual Meeting, Portland - Oregon
Barden, P. & Grimaldi, D. Cretaceous context: understanding fossil ant diversity. Talk.

Evolution Meeting
June 22, Annual Meeting, Raleigh - North Carolina
Barden, P. Ants in the age of dinosaurs: a history from amber. Talk.

Social Insects In the North-East Regions Meeting
May 28, Annual Meeting, Philadelphia - Pennsylvania
Barden, P. Life in the Cretaceous: ant diversity, ecology, and sociality one hundred million years ago. Talk.

Rockefeller University Seminar
Feb 27, Social Insect Lab Seminar, New York City - New York
Barden, P. Unearthing a History from Fossils: Ants through Time, Space, and Sociality. Invited talk.

2013 Entomological Society of America Meeting
November 13, Annual Meeting, Austin - Texas
Barden, P. & Grimaldi, D. Uncovering a Cretaceous ant genus. Talk.

Evolution Meeting
June 25, Annual Meeting, Snowbird - Utah
Barden, P. What 20 million-year-old Caribbean fossils can tell us about Indo-Australian ants today. Talk.

MENTORSHIP & SYNERGISTIC ACTIVITIES (2013-PRESENT)

Postdoctoral Mentorship
2019-20 Dr. Solomon Chak
2018-19 Dr. Ninon Robin, Fulbright-funded visiting scholar (Commission Franco-Américaine)

Graduate Student Advisees
New Jersey Institute of Technology
2020- Gianpiero Fiorentino, PhD Candidate [advisor]
2018-23 Christine Sosiak, PhD [advisor]

Dissertation Committees & Rotation Students

New Jersey Institute of Technology & Rugers-Newark

2023- Anthony Sena, PhD Student
2023 Tara Walenczyk, MS
2023 Dahlia Mansour, MS
2022- Felipe Eduardo Alves Coelho, PhD Candidate
2022- Pedro Ivo Monico, PhD Student
2020- Hale Amplo, PhD Candidate
2021-23 Nicole Dykstra, PhD
2021 Indira Sawh, Rotation MS Student
2020-22 Justin Bernstein, PhD
2019-20 Rebecca Panko, PhD
2019-22 Alexander Clark, PhD [Physics]
2019 Erin McHale, Rotation PhD Student
2019 Ian Hayes, Rotation PhD Student
2018-21 Callie Crawford, PhD

Undergraduate Mentorship

New Jersey Institute of Technology (^NJIT Provost Fellow; *McNair Fellow)

2023- Luke Biting (morphology)
2023- Sera Ko (morphology)
2023- Pranathi Miryala (morphology)
2023- Hannah Shahinian (ecology)
2023- Saskia Trommelen (morphology)
2021-23 Eunice Bae (CT-scanning)
2020-23 Jeeshan Ahmed (morphology)
2020-22 Waleed Mujib (morphology)
2020 Camila Sierra-Gutierrez (morphology)
2020 Elias Bakhtiar (paleontology)
2020 Patrick Krawczyk (paleontology)
2019-21 Thomas Vida (ecology)
2019-21 Xavier Reyes (ecology)
2019-21 Andre Pugliese^ (ecology, genomics)
2019 Daniel Meza (industrial design)
2019 John-Anthony Pizzi (biomechanics)
2018-21 Priscilla Rofail (genetics)
2018-21 Nitya Shah (morphology, parasitism)
2018-21 Amina Siraj* (paleontology)
2018 Jackson Fordham (industrial design)
2018 Victor Nzegwu (industrial design)
2018 Oliver Budd (industrial design)
2018 Hala Abbas (educational outreach)
2017-20 Chloe Jelley^ (evolution and morphology)
2017-19 Hajar Elalam (material science)
2017-18 Jonathan Trinidad (ecology of invasive species)

Rutgers University

2016-18 Catalina Guzman (LSAMP – pop gen, ecology)
2016-17 Carlos Macazana (LSAMP/PCCC - ecology)
2016 Ahmed Abdelhamid (3D modeling and ecology)
2016 Krista Barbour (ecology)

NSF-funded fieldwork

2016 Michael Acid (University of Missouri-St. Louis - animal behavior)
Stephanie Mafla-Mills (University of Missouri-St. Louis - ecology)
Kenneth Butler (University of Guyana - ecology and biodiversity)

High School Mentorship (^NJIT Provost Fellow**)**

2021-22 Ren Kondo (morphology)
2019-20 Diana Martinez (morphology)
2019 Annie Chen^ (ecology)
2018 Alan Chen^ (paleontology)
2016 Sophie Chen (paleontology and morphometrics)
2013-16 Gwyneth Campbell (scientific illustration)

Select Public Outreach

2019 **Art+Science Exhibition – Contributior**
New Jersey Institute of Technology
Temporary exhibit on the convergence of art and science.

Skype a Scientist – Speaker
Classrooms in Atlanta and Oklahoma City (via video)
Discussions with 8th-10th grade classrooms about evolution, paleontology, and path to becoming a scientist.

2018 **Birmingham Audubon Nature Program – Speaker**
Birmingham Botanical Gardens. Birmingham, Alabama
Meet and greet, as well as public lecture on paleontology, extinction, and ants.

Secret Science Club – Speaker
The Bellhouse. Brooklyn, New York.
Public lecture for science enthusiasts titled “Beyond Jurassic Park.”

2016 **Amber Secrets – Exhibit Contributor**
The Houston Museum of Natural Science. Houston, Texas
Contributed media and text relating to reconstruction of fossil species using X-ray imaging.

2015 **NY Eats Bugs – Speaker**
The Explorer's Club. New York, New York
Event on innovation, future applications of entomophagy. Spoke on insect diversity and evolution.

2014-15 **Project TRUE – Speaker**
Prospect Park Zoo. Brooklyn, New York
Project TRUE is an NSF funded WCS outreach program rooted in urban ecology. Discussions with high school students in biodiversity and ecology as well as scientific career routes.

2012-15 **Adventures in Science – Speaker and Demonstrator**
American Museum of Natural History. New York, New York
Classes with children grades 2-5 on amber formation, preservation of arthropods, and scientific process of paleoentomology.

2013-14 **Center for Talented Youth – Speaker**
American Museum of Natural History. New York, New York
Elementary and middle school students from the John Hopkins Center for Talented Youth attended museum programs focused on temporary exhibits. Presented talks entitled "How Evolution Works: From Ants to Whales" and "Poison Strategies in Animals"

2013 **Myrmex: A Comic Ant-thology – Contributor and Editor**
A crowd-funded collaborative effort between illustrators and scientists, Myrmex is a publicly available print and E-book resource for K-12 teachers. The book creatively covers concepts in general biology and biodiversity, and has been distributed to classrooms in New York City.

2011-13 **National Fossil Day – Demonstrator**
American Museum of Natural History. New York, New York
Museum-wide event for middle school students with hands-on demonstrations celebrating paleontology. Discussed methods and explored specimens with students using microscopes.

2013 **Maker Faire – Educator**
New York Hall of Science. New York, New York
Massive Disney funded fair with a focus on "do-it-yourself" technology and science education engagement. Spoke to fair attendees about CT-scanning, 3D printing, and paleontology.

2011 **Fellowship of the Young Scientist – Volunteer Co-Instructor**
American Museum of Natural History. New York, New York
Weekly afterschool class for 3rd grade students relating to natural history with the aim of cultivating long-term interest in science. Assisted with presentations, demonstrations, and lesson plan development for course in historical scientific expeditions and exhibit design.

2011 **Meet the Scientist Program– Speaker**
American Museum of Natural History. New York, New York
A series of three interactive lectures focused on making science accessable and interesting to New York City school children ages 7-11. Discussion centered around ant diversity, ecological importance, and the path toward becoming a scientist.

2011 **Picturing Science – Exhibit Contributor**
American Museum of Natural History. New York, New York
Three-year exhibit highlighting imaging techniques that museum scientists employ. Contributed images and text showcasing CT-scanning technology and it's application for exploring internal and external morphology of an amber ant fossil.

SELECT POPULAR PRESS

2021 **Tiny rare fossil found in 16 million-year-old amber is 'once-in-a-generation' find**
CNN
Tardigrade in amber
CBC: As It Happens
Researchers found a new species of water bear fossilized in a hunk of ancient amber
NPR
The Reign of the Hell Ants
PBS Eons Digital Video

2020 **Fossil Records Show Hell Ants Had "Mad Max" Style Mandibles**
Science Friday Radio
Fossil captures ancient 'hell ant' in action
Science Magazine
Prehistoric 'hell ants' hunted their prey with unusual headgear
CNN
99-million-year-old fight between 'hell ant' and its prey preserved in amber
BBC Science Focus
In rare find, fossil shows how Cretaceous-era 'hell ant' ate its prey with weird jaws
Washington Post (Print & Digital)
Paleontologists Predict What Future Animals Might Look Like
Gizmodo
Oldest-ever fossil bee nests discovered in Patagonia
National Geographic

2019 **Fossil reveals 16-million-year-old hitchhikers**
Cosmos Magazine
How One Entomologist Looks to Fossil Ants to Answer Big Biology Questions
Entomology Today
NJIT Student-Faculty Team Collaborates to Raise Prehistoric "Hell Ants" to Life
New Jersey Institute of Technology News
Famous Extinct Sea Creature Somehow Wound Up in 99-Million-Year-Old Tree Resin
Gizmodo

2018 **Freakonomics Radio Live: Tell Me Something I Don't Know**
Radio/Podcast

2017 **Meet the vampire ant from hell with huge jaws and a metal horn**
New Scientist
Publication featured on Daily Planet television Show
Discovery Channel Canada
Prehistoric 'Hell Ant' Sported Metal Spike for Sucking Blood
How Stuff Works

2016 **These Tiny Saber-Toothed Terrors Are Among the World's Oldest Ants**
Smithsonian Magazine
Ants locked in mortal combat for 99 million years
Canadian Broadcasting Corporation Radio: Quirks & Quarks
Ant Warfare: Fossils Reveal Insects Locked in Mortal Combat
LiveScience
Ancient Ants in Amber Were Like Today's Social Brawlers
Discovery News
Ancient amber proves early insects were keen on high society
CNET

2015 **Earning a Doctorate on the 'Night at the Museum' Campus**
New York Times
The Six Most Incredible Fossils Preserved In Amber
Forbes Science

2014 **Analyzing Extinct Ants in Amber**
American Museum of Natural History News

2012 **A Cretaceous *Haidomyrmex* as the first trap-jaw ant?**
Myrmecos Blog
2011 **The Critter People**
New York Times

PROFESSIONAL SERVICE

Editorial Boards

PLoS One (academic editor)	2019-Present
Frontiers in Earth Science; *Frontiers in Ecology and Evolution* (review editor)	2021-2023
Journal of Insect Science (editorial board)	2017-2019

Journal Issues Edited

Palaeoentomology, Vol. 5 No. 5, Festschrift issue honoring David Grimaldi	2022
Frontiers in Earth Science, A Fossil View of Insect Evolution	2021-2022

Journal Referee (42 outlets): *Anais da Academia Brasileira de Ciências*, *Annals of the Entomological Society of America*, *Arthropod Structure and Development*, *Biological Journal of the Linnean Society*, *BMC Ecology & Evolution*, *Bulletin of Geosciences*, *Cladistics*, *Comptes rendus Palevol*, *Cretaceous Research*, *Current Biology*, *Earth Science Reviews*, *Florida Entomologist*, *Functional Ecology*, *Geological Magazine*, *Gondwana Research*, *Historical Biology*, *Insect Systematics and Diversity*, *Insect Systematics & Evolution*, *Integrative and Comparative Biology*, *iScience*, *Journal of Animal Ecology*, *Journal of Morphology*, *Journal of Zoology*, *Molecular Ecology*, *Myrmecological News*, *National Science Review*, *Nature Communications*, *Nature Scientific Reports*, *Neues Jahrbuch für Geologie und Paläontologie*, *Optical Engineering*, *Palaeobiodiversity and Palaeoenvironments, Palaeoentomology, Palaeoworld*, *PeerJ*, *PLoS One*, *Proceedings of the National Academy of Sciences*, *Science Advances*, *Sociobiology*, *Systematic Entomology*, *Zookeys*, *Zoological Journal of the Linnean Society*, and *Zootaxa*.

International Paleoentomological Society Scientific Committee — 2019-Present
Elected North America representative

Entomological Society of America Publications Council — 2019-Present
Elected to oversight council for nine society journals
serving on editor-in-chief search and appeals subcommittees.

Entomological Society of America Annual Meeting Program Committee — 2020-Present
Nominated program co-chair for 2021, 2022, and 2023 joint annual meetings

Grant Panel Review Service

National Science Foundation	2018, ‘20, ‘21, ’22, ‘23
Society of Systematic Biologists Graduate Student Research Awards	2020

Conferences Organized

Regional Meeting - 10th Social Insects in the North East Regions Conference	2022

University Service at the New Jersey Institute of Technology

Department of Biological Sciences – Graduate Assessment Committee	2022
Department of Biological Sciences – PhD admissions committee	2018-Present
Department of Biological Sciences – Director of Digital Communications	2017-2022
University-wide – Pre-Health Committee	2017-Present
College of Liberal Arts and Sciences – Faculty Seed Grant Review Committee	2019

Other Guest Lectures

Harvard University – Paleontology/Ethics	Fall 2021
Rutgers University – Graduate Evolution	Spring 2021
New Jersey Institute of Technology – Evolution	Spring 2019
New Jersey Institute of Technology – Biological Imaging Techniques	Spring 2018 Fall 2019, ‘20

Rutgers University – Undergraduate Ecology Summer 2017
Columbia University – Undergraduate Insect Diversity Fall 2014/2016

Comparative Biology PhD Program Committee Representative 2012-2014
Elected student representative to graduate school committee at the American Museum of Natural History.