Dr. Elinor M. Lichtenberg

University of North Texas elichten@unt.edu
Department of Biological Sciences Twitter, Bluesky: @DrEMLichtenberg
1155 Union Circle #310559 Mastodon: @DrEMLichtenberg@ecoevo.social
Denton, TX 76203-5017

EDUCATION

Ph.D. 2011	University of California, San Diego. Division of Biological Sciences		
	Eavesdropping, Foraging and Dominance in Keystone Neotropical Pollinators:		
	Stingless Bees, Advisor: James Nieh		

B.S. 2003 University of Maryland, College Park. Biology: Behavior, Evolution, Ecology, and Systematics, *Summa cum Laude*, Biology High Honors, French Concentration Honors Thesis: *Abdomen Bobbing in Stalk-eyed Flies*, Advisor: Gerald Wilkinson

APPOINTMENTS

2020-present	Assistant Professor, Department of Biological Sciences, University of North
	Texas
2017-2019	Research Fellow, Department of Integrative Biology, The University of Texas at
	Austin, Austin, TX. Advisor: Shalene Jha
2015-2017	Postdoctoral Research Associate, Department of Ecology and Evolutionary
	Biology, The University of Arizona, Tucson, AZ. Advisor: Judith Bronstein
2013-2015	Postdoctoral Research Associate, Department of Entomology, Washington State
	University, Pullman, WA. Advisor: David Crowder

GRANTS AND FELLOWSHIPS

<u>Funded</u>	
2024-2027	US Department of Agriculture, AFRI Foundational and Applied Science grant,
	Environmental and Natural Resource Economics program (\$650,000). "Setting
	Priorities for Managing Pollinator Habitat." Co-PD with PD Erik Lichtenberg,
	University of Maryland and Co-PD Kathy Baylis, University of California, Santa
	Barbara.
2024-2027	Dixon Water Foundation (\$74,480). "Linking Ranch Management to Pollinator
	Conservation." PI.
2024	UNT Colleges of Engineering and Science, Collaborative Research Seed Grant
	(\$10,000). Combining ecological data and modeling with remote sensing to
	identify managed pollinators toward landscape-crop pollination system
	evaluation." PI with Co-PI Xiaohui Yuan, UNT.

2024 UNT Advanced Environmental Research Institute, Summer Pilot Project program (\$10,000). "Effects of livestock grazing strategies on rangeland ecosystem service providers." PI with Co-PI Calvin Henard, UNT.

2022-2026 US Fish and Wildlife Services State Wildlife Crants Program (\$200,000)

2023-2026 **US Fish and Wildlife Service**, State Wildlife Grants Program (\$200,000) "Checklist Development and Conservation Status Assessment of Texas Native Bees." PI.

2023-2025 **US Department of Agriculture**, Southern SARE On-Farm Grant (\$30,000). "Assessing impacts of grazing management on pollinator conservation in rangeland." PI.

2023-2024	UNT Colleges of Engineering and Science , Collaborative Research Seed Grant (\$10,000). "GRAPH-N: Generating Rapid Applications for Predicting Heuristic Networks." Co-PI with PI Zacchaeus Compson and Co-PIs Jason Bohenek, Sanjukta Bhowmik, Yunhe Feng, UNT.
2022-2023	US Fish and Wildlife Service, State Wildlife Grants Program (\$105,000) "Texas
	Native Bee Conservation Status Assessment and Digitizing the UNT Invertebrate Collection." PI with Co-PI Jim Kennedy, UNT.
2022	USDA E. Kika De La Garza Fellow
2020-2023	US Fish and Wildlife Service, State Wildlife Grants Program (\$386,117) "Multi-
	year Investigation of Restoration Impacts on Pollinator Communities & Plant-
	Pollinator Interactions." Co-PI with PI Shalene Jha, University of Texas at Austin
	and Kristen Baum, Oklahoma State University.
2018	Prairie Biotic Research, Small Grant (\$1,500) "Diversity of beetle and fly
	pollinators at experimentally restored prairies." PI.
2017	American Association of University Women, American Postdoctoral Fellowship
	(Declined; \$30,000)
2013	WSU College of Agricultural, Human, and Natural Resource Sciences,
	internship grant (\$2,500). "Aphid pest management." Co-PI with David Crowder.
2010-2011	ARCS Foundation, Graduate Scholar Award (\$7,500). PI.
2009-2012	National Science Foundation, Doctoral Dissertation Improvement Grant
	(\$13,000). "DISSERTATION RESEARCH: Landscape-scale effects of
	competition and eavesdropping in stingless bees." Co-PI with James Nieh.
2009	Animal Behavior Society, Research Grant (\$1,000). "Context-dependent
	eavesdropping in stingless bees." PI.
2006-2009	National Science Foundation, Graduate Research Fellowship (\$125,645).
2006	Association of Women in Science San Diego Chapter, Scholarship Award
	(\$1,000). PI.
2005-2009	University of California, San Diego, Chancellor's Graduate Fellowship (\$20,000).
2001-2003	Howard Hughes Medical Institute, Undergraduate Research Fellowship
	(\$14,000).

<u>Under review or submission imminent</u>

National Science Foundation, Emerging Mathematics in Biology Program (\$616,090). "CYMES: CYberinfrastructure for Modeling and Analyzing Ecological Data at Scale." Co-PI with PI Zacchaeus Compson and Co-PIs Jason Bohenek, Sanjukta Bhowmik, Yunhe Feng, University of North Texas.

- **National Science Foundation**, Division of Integrative Organismal Systems Core Programs (\$652,812). "Determining Ecologically-realistic Social Information Use by Foraging Animals." PI with Co-PI Wynn Meyer, Lehigh University.
- **National Science Foundation**, Faculty Career Early Development Program (\$1,098,246). "CAREER: Life outside the flower: advancing understanding of context dependent mutualisms and roles of non-exchanged resources". PI.
- **US Department of Agriculture**, AFRI Foundational and Applied Science grant, Sustainable Agroecosystems program (\$750,000). "Assessing the effects of livestock grazing strategies on rangeland ecosystem service providers." PD with Co-PDs Jeff Goodwin, Texas A&M University and Calvin Henard, UNT.

AWARDS AND HONORS

2018	International Union for the Study of Social Insects (IUSSI)-North American
	Section, Travel Award
2018	University of Texas College of Natural Sciences, Rom Rhome International
	Professional Development Award
2017	Ecological Society of America Early Career Ecologist Section , Outstanding
	Publication Award Finalist
2016	National Science Foundation, early career investigator travel award,
	International Society for Behavioral Ecology 2016 conference
2012	IUSSI-North American Section, Travel Award
2012	IUSSI-North American Section, Conference Award
2010	IUSSI-North American Section, travel grant
2008	Entomological Society of America, President's Prize - First Place
2002	University of Maryland, Baltimore County, First Place, Biological Sciences
	Group 2 Poster Session, 5 th Annual Undergraduate Research Symposium in the
	Chemical and Biological Sciences
2002	Animal Behavior Society, Genesis Award (Best Undergraduate Poster) -
	Honorable Mention
2002-present	Phi Beta Kappa
2002	Phi Beta Kappa Gamma of Maryland, Junior Award (Outstanding Junior
	Inductee)

PUBLICATIONS

- * Joint first authors, G Graduate co-author
- **Lichtenberg EM**, Heiser J^U, Baum KA, Neff JL, Jha S. Floral visitors differentially respond to local and landscape grassland features. Submitted to *Insect Conservation and Biodiversity*.
 - Preprint: https://www.biorxiv.org/content/10.1101/2024.07.01.601588v1
- Cordeiro GD, Giannini TC, Consorte PM, Costa ACJ, Machida WS, Marques BF, Mazzei ND, Menezes PP, Resende LS, Shimoda J, Sousa FG, Souza RS, Acosta AL, Aguiar AJC, Almeida EAB, Alves DA, Alves-dos-Santos I, Andrade TO, Evandson JA-S, Barbosa AS, Barbosa ERM, Bezerra LA, Borges RC, Brito, TF, Camacho GP, Campbell AJ, Castro MS, Coelho BWT, Ferrari RR, Garófalo CA, González-Chaves AD, Keller GO, Lichtenberg EM, Martínez-Martínez CA, Martins MB, Martins AC, Maués MM, Moleiro HP, Mouga DMDS, Oliveira FF, Ramos KS, Ramos RL, Rocha-Filho LC, Santos IPV, Santos S, Santos-Júnior JE, Shibata A, Silva DP, Teixeira CMN, Tietz AL, Trinidade-Santos ME, Vilhena PS, Vivallo F, Carvalheiro LG. Brazilian Bee Traits Database: addressing the Raunkiærian shortfall for Neotropical bees. Submitted to *Ecology*.
- 22) Dorey J, Chesshire P, Bolaños A, O'Reilly R, Bossert S, Collins S^G, **Lichtenberg E**, Tucker EM, Smith-Pardo A, Falcon-Brindis A, Guevara D, Ribeiro B, Pedro Dd, Fischer E, Pickering J, Hung K, Parys K, Mccabe L, Rogan M, Michkley R, Velazco S, Grisswold T, Zariillo T, Jetz W, Sica Y, Orr M, Guzman L, Ascher J, Hughes A, Cobb N. 2023. A globally synthesized and flagged bee occurrence dataset and cleaning workflow. *Scientific Data* 10: 747.
 - Preprint: https://doi.org/10.1101/2023.06.30.547152
 - Data: https://doi.org/10.25451/flinders.21709757
 - R package: https://jbdorey.github.io/BeeBDC/

- 21) **Lichtenberg EM**, Milosavljević I, Campbell AJ, Crowder DW. 2023. Differential effects of soil conservation practices on arthropods and crop yields. *Journal of Applied Entomology* 147: 931-940.
 - Preprint: https://doi.org/10.1101/2021.12.06.471474
 - Data: https://zenodo.org/doi/10.5281/zenodo.8253577
- 20) Allen-Perkins A, [87 additional authors], **Lichtenberg EM**, [91 additional authors], Ignasi Bartomeus. 2022. CropPol: a dynamic, open and global database on crop pollination. *Ecology* 103: e3614.
- 19) Campbell AJ*, **Lichtenberg EM***, Carvalheiro LG, Menezes C, Cabral RB, Coelho BTW, Freitas MAB, Giannini TC, Leão KL, Olivera FF, Silva TSF and Maués MM. 2022. High bee functional diversity buffers crop pollination services against Amazon deforestation. *Agriculture, Ecosystems & Environment* 326: 107777.
- 18) Baylis K, Lichtenberg EM and Lichtenberg E. 2021. Economics of pollination. *Annual Review of Resource Economics* 13: 335-354.
- 17) **Lichtenberg EM**, Irwin RE and Bronstein JB. 2020. Bumble bees are constant to nectar-robbing behaviour despite low switching costs. *Animal Behaviour* 170: 177-188.
- 16) Lichtenberg EM*, Heiling JM*, Bronstein JL and Barker, JL. 2020. Noisy communities and signal detection: why do foragers visit rewardless flowers? *Philosophical Transactions of the Royal Society B: Biological Sciences* 375: 20190486.
- 15) **Lichtenberg EM***, Richman SK*, Irwin RE and Bronstein JB. 2020. Competition for nectar resources does not affect bee foraging tactic constancy. *Ecological Entomology* 45: 904-909.
- 14) **Lichtenberg EM**, Irwin RE and Bronstein JB. 2018. Costs and benefits of alternative food handling tactics help explain facultative exploitation of pollination mutualisms. *Ecology* 99: 1815-1824.
 - Data: https://zenodo.org/record/1243208
- 13) **Lichtenberg EM**, Mendenhall CM and Brosi BJ. 2017. Foraging traits modulate stingless bee community disassembly under forest loss. *Journal of Animal Ecology* 86: 1404-1416.
 - Data: https://zenodo.org/record/843615
- 12) van Engelsdorp D, Traynor KS, Andree M, **Lichtenberg EM**, Chen Y, Saegerman C and Cox-Foster DL. 2017. Colony collapse disorder (CCD) and bee age impact honey bee pathophysiology. *PLOS ONE* 12: e0179535.
- 11) Bronstein JB, Barker JL, **Lichtenberg EM**, Richardson LL and Irwin RE. 2017. The behavioral ecology of nectar robbing: why be tactic constant? *Current Opinion in Insect Science* 21: 14-18.
- 10) **Lichtenberg EM**, Kennedy CK, Kremen C, [60 additional authors] and Crowder DC. 2017. A global synthesis of the effects of diversified farming systems on arthropod diversity at field and landscape scales. *Global Change Biology* 23: 4946-4957.
 - Data: https://zenodo.org/record/439109
- 9) Lichtenberg EM, Graff Zivin J, Hrncir M and Nieh JC. 2014. Eavesdropping selects for conspicuous signals. *Current Biology* 24: R598-R599.
- 8) Pettis JS, **Lichtenberg EM**, Andree M, Stitzinger J, Rose R and vanEngelsdorp D. 2013. Crop pollination exposes honey bees to pesticides which alter their susceptibility to the gut pathogen *Nosema ceranae*. *PLOS ONE* 8: e70182.
 - Highly Cited Paper in Web of Knowledge
 - Used as a teaching model for how to structure a scientific paper by the World Health Organization's Hinari Access to Research for Health program.

- (http://slideplayer.com/slide/4121536/ slide 28; I principally wrote the PLOS ONE article.)
- 7) Pettis JS, Rose R, Lichtenberg EM, Chantawankul P, Buawangpong N, Somana W, Prachaval S and vanEngesldorp D. 2013. A rapid survey technique for *Tropilaelaps* mite detection. *Journal of Economic Entomology* 106: 1535-1544.
- 6) Lichtenberg EM and Brosi BJ. 2012. Expanded ranges of two stingless bee species: *Aparatriona isopterophila* and *Ptilotrigona occidentalis*. *Journal of the Kansas Entomological Society* 85: 374-377.
- 5) Lichtenberg EM, Hrncir M, Turatti IC and Nieh JC. 2011. Olfactory eavesdropping by two competing stingless bee species. *Behavioral Ecology and Sociobiology* 65: 763-774.
- 4) **Lichtenberg EM**, Imperatriz-Fonseca VL and Nieh JC. 2010. Behavioral suites mediate group-level foraging dynamics in communities of tropical stingless bees. *Insectes Sociaux* 57: 105-113.
- 3) Lichtenberg EM, Hrncir M and Nieh JC. 2009. A scientific note: Foragers deposit attractive scent marks in a stingless bee that does not communicate food location. *Apidologie* 40: 1-2.
- 2) **Lichtenberg EM** and Hallager S. 2008. A description of commonly observed behaviors for the kori bustard (*Ardeotis kori*). *Journal of Ethology* 26: 17-34.
- 1) Hallager S and Lichtenberg EM. 2007. New display behavior in male kori bustard (*Ardeotis kori strunthiunculus*). *The Wilson Journal of Ornithology* 119: 750-755.

Manuscripts in preparation

- Collins SM^G, Taylor LA, Wright KW, **Lichtenberg EM**. Local nesting resources alter groundnesting bee communities. In preparation for *Journal of Applied Ecology*.
- Muñiz M^U, Meadows B^U, Lopez P^U, **Lichtenberg EM**. Social information use across trophic guilds. In preparation for *Behavioral Ecology and Sociobiology*.

Non-peer-reviewed-publications

- **Lichtenberg EM**, Pearson AE^G. 2023. Pollinators & Pollination: Nature and Society. Jeff Ollerton. 2021. Pelagic Publishing, Exeter, United Kingdom. 286 pp. \$32.00 paperback. ISBN: 978-1-78427-228-9. *The Journal of Wildlife Management* 87: e22416. (book review)
- Koch, JB, Looney C, Hopkins B, **Lichtenberg EM**, Sheppard WS and Strange JP. 2019. Projected climate change will reduce habitat suitability for bumble bees in the Pacific Northwest. BioRxiv. https://www.biorxiv.org/content/10.1101/610071v1
- Strange JP, Koch JB, Sheperd WS, Hopkins B, Long J, **Lichtenberg EM** and Looney C. 2014. Bumble bee community composition and population genetic diversity in the North Cascades and coast network: 2013 progress report. Seattle, WA: Pacific NW Cooperative Ecosystem Studies Unit.

INVITED TALKS

^GGraduate co-author, ^UUndergraduate co-author

- Mar. 2024 **Lichtenberg EM**. "Eavesdroppers and robbers and spies, oh my! Decision-making by foraging bees." Animal Behaviour Live Seminar series (online).
- Feb. 2024 **Lichtenberg EM.** "Insect biodiversity and foraging in human-altered landscapes." Department of Natural Resources & Environmental Sciences, University of Illinois (Urbana, IL).
- Jun. 2023 **Lichtenberg EM**, Jha S, Pearson A^G, Collins S^G, Lopez E^U, Baum K. "Habitat needs of diverse pollinators determine insect conservation and sustainable land

- management." International Conference on Pollinator Biology, Health & Policy (State College, PA).
- Apr. 2022 **Lichtenberg EM**. "Pollinator biodiversity and pollination in human-dominated landscapes." Division of Biology, Texas Women's University (Denton, TX).
- Jul. 2021 **Lichtenberg EM**. "Pollinator biodiversity and pollination in human-dominated landscapes." USDA Temperate Tree Fruit and Vegetable Research Unit (Wapato, WA).
- Oct. 2020 **Lichtenberg EM**. "Pollinator biodiversity and pollination in human-dominated landscapes." Program in Ecology and Evolutionary Biology, Texas A&M University (College Station, TX).
- Sep. 2020 **Lichtenberg EM**. "Pollinator biodiversity and pollination in human-dominated landscapes." Department of Biological Sciences, University of North Texas (Denton, TX).
- Feb. 2019 **Lichtenberg EM.** "Insect biodiversity and foraging under habitat restoration." Department of Biological Sciences, University of North Texas (Denton, TX).
- Feb. 2019 **Lichtenberg EM**. "Insect biodiversity and foraging in dynamic landscapes." Department of Biological Sciences, Fordham University (Bronx, NY).
- Jan. 2019 **Lichtenberg EM**. "Improving ecological management through understanding plant-animal interactions." School of Biological Sciences, Queens University Belfast (Belfast, UK).
- Nov. 2018 **Lichtenberg EM**, Crowder DW Milosavljević I, Jha S, Heiser J^U. "Pollinator responses to habitat loss and sustainability-oriented farming practices." Entomological Society of America Annual Meeting (Vancouver, Canada).
- June 2018 Lichtenberg EM. "My plans in research and teaching." School of Biological Sciences, University of Bristol (Bristol, UK).
- May 2018 Lichtenberg EM. "Insect biodiversity and foraging in dynamic landscapes." Department of Ecology and Evolution, Université de Lausanne (Lausanne, Switzerland).
- Mar. 2018 **Lichtenberg EM**. "Multifunctionality and insect foraging in dynamic landscapes." Department of Biology, Georgia Southern University (Statesboro, GA).
- Aug. 2017 **Lichtenberg EM**, Kennedy CK, Crowder DW. "Can environmental heterogeneity support multiple ecosystem services in agricultural landscapes? A global perspective." Early career perspectives on Future Earth: ecology & civilization webinar.
- Feb. 2017 **Lichtenberg EM**. "Multi-scale pollination dynamics in a changing world." Department of Biology, New Mexico State University (Las Cruces, NM).
- Mar. 2016 **Lichtenberg EM**. "Bee foraging behavior and ecology in anthropogenic landscapes." Department of Ecology and Plant Pathology, Auburn University (Auburn, AL).
- Feb. 2016 **Lichtenberg EM**. "Plant-pollinator interactions in a changing world." Department of Biology, Geology and Environmental Science, University of Tennessee Chattanooga (Chattanooga, TN).
- Sep. 2015 **Lichtenberg EM**. "Eavesdropping, foraging and dominance in keystone Neotropical pollinators: stingless bees." Department of Entomology, The University of Arizona (Tucson, AZ).

- Feb. 2015 **Lichtenberg EM**. "Eavesdropping, foraging and habitat loss in keystone Neotropical pollinators, stingless bees." Department of Entomology, University of California, Riverside (Riverside, CA).
- Feb. 2015 **Lichtenberg EM**. "Effects of community-level interactions on bee foraging." Department of Biological Sciences, Mississippi State University (Starkville, MS).
- Nov. 2014 **Lichtenberg EM**, Kennedy C, Crowder D. "Effects of agricultural management and landscapes on the abundance and diversity of arthropods: a global analysis." Entomology 2014 (Portland, OR).
- Dec. 2013 **Lichtenberg EM**. "Eavesdropping, foraging and dominance in keystone Neotropical pollinators: stingless bees." Department of Entomology, Washington State University (Pullman, WA).
- Oct. 2013 **Lichtenberg EM** and Brosi BJ. "Stingless bee species' traits alter responses to deforestation." WSU School of Biological Sciences Ecolunch (Pullman, WA).
- Sep. 2013 **Lichtenberg EM**. "Eavesdropping selects for conspicuous signals." Palouse Ecologists, Evolutionary Biologists and Systematists (Moscow, ID).
- Aug. 2012 **Lichtenberg EM**, Nieh JC. "Heterospecific recruitment pheromones facilitate efficient foraging by keystone Neotropical pollinators." Ecological Society of America Annual Meeting (Portland, OR).
- May 2012 **Lichtenberg EM.** "Eavesdropping, foraging and dominance in keystone Neotropical pollinators: stingless bees." Department of Entomology, National Museum of Natural History (Washington, D.C.).
- Feb. 2012 **Lichtenberg EM.** "Eavesdropping, foraging and dominance in keystone Neotropical pollinators: stingless bees." Biology Department, Georgetown University (Washington, D.C.).
- Jan. 2012 **Lichtenberg EM.** "Eavesdropping, foraging and dominance in keystone Neotropical pollinators: stingless bees." Bee Research Laboratory, Agricultural Research Service, US Department of Agriculture (Beltsville, MD).
- Nov. 2011 **Lichtenberg EM.** "Eavesdropping, foraging and dominance in keystone Neotropical pollinators: stingless bees." Department of Entomology, University of Maryland, College Park (College Park, MD).
- Feb. 2011 **Lichtenberg EM**. "Context-dependent eavesdropping by stingless bees." UCSD Division of Biological Sciences Recruitment (La Jolla, CA).
- Aug. 2010 **Lichtenberg EM.** "Eavesdropping, foraging and dominance in keystone Neotropical pollinators: stingless bees." Department of Biological Sciences, Aarhus University (Aarhus, Denmark).
- Aug. 2010 **Lichtenberg EM.** "Eavesdropping, foraging and dominance in keystone Neotropical pollinators: stingless bees." School of Biological and Environmental Sciences, University of Stirling (Stirling, Scotland).
- July 2010 **Lichtenberg EM.** "Dominance and context-dependent eavesdropping by stingless bees." IX Encontro sobre Abelhas: Genética e Biologia Evolutiva de Abelhas (Ribeirão Preto, Brazil).
- Feb. 2010 **Lichtenberg EM**. "Context-dependent eavesdropping by stingless bees." UCSD Division of Biological Sciences Recruitment (La Jolla, CA).
- July 2008 **Lichtenberg EM**. "Scent marking by stingless bees." VIII Encontro sobre Abelhas: Biodiversidade e Uso Sustentado de Abelhas (Ribeirão Preto, Brazil).

PRESENTATIONS

- ^G Graduate co-author. ^U Undergraduate co-author
- Aug. 2024 **Lichtenberg EM**, Collins SM^G, Pearson AE^G. Using insect traits to develop a predictive understanding of human impacts on pollination. Unifying Ecology Across Scales Gordon Research Conference (Manchester, NH). Poster.
- Nov. 2023 Pearson AE^G, Collins SM^G, Taylor LA, **Lichtenberg EM**. Synergies and tradeoffs in conserving diverse pollinators: a traits-based approach. Entomological Society of America Annual Meeting (Fort Washington, MD). Oral presentation.
- Aug. 2023 Collins SM^G, Ferring R, **Lichtenberg EM**. Bottom-up impacts of rotational grazing disturbance on ground-nesting bee assemblages: do they dig it? Ecological Society of America Annual Meeting (Portland, OR). Poster.
- Aug. 2023 Raulinaitis L, Griffin SR, **Lichtenberg EM**, Baum K, Jha S. Grassland restoration mediates plant-pollinator species interaction network reassembly. Ecological Society of America Annual Meeting (Portland, OR). Poster.
- Jul. 2023 Muñiz ML^U, Gage A^U, Linogao J^U, Lopez PA^U, Meadows BT^Ú, Neathery A^U, Vohs M, **Lichtenberg EM**. Can Bumble Bees Learn from Lady Beetles? Animal Behavior Society Annual Meeting (Portland, OR). Poster.
- Jul. 2023 Whyle RL^G, **Lichtenberg EM**. Behavioral and Ecological Drivers of Insect Cuticular Hydrocarbon Profiles. Animal Behavior Society Annual Meeting (Portland, OR). Poster.
- Aug. 2022 Whyle RL^G, Wei N, Trowbridge AM, Ashman T-L, **Lichtenberg EM**, Jamieson MA. Genoptye, mycorrhizae, and herbivory interactively shape plant functional traits and the floral microbiome. Ecological Society of America Annual Meeting (Montréal, QC). Oral presentation.
- Aug. 2022 Collins SM^G, Ferring RC, **Lichtenberg EM**. Bottom-up impacts of rotational grazing disturbance on ground-nesting bee assemblages: do they dig it? Ecological Society of America Annual Meeting (Montréal, QC). Poster.

 Winner, E. Lucy Braun Award (best poster)
- Aug. 2021 **Lichtenberg EM**, Vohs M, Gage A^U, Lopez PA^U, Muniz M^U. Can bees learn from beetles? Social learning across insect orders. Animal Behavior Society Annual Meeting (virtual). Poster.
- Aug. 2020 Lichtenberg EM, Richman SK, Irwin RE, Bronstein JL. "Why do nectar-robbing bees show high food handling tactic constancy?" Animal Behavior Society Annual Meeting (virtual). Oral presentation.
- Aug. 2020 Lopez EA, Griffin SR, **Lichtenberg E**, Wilhelm S, Baum K, Jha S. "Effects of prescribed burns on pollination networks in restored prairies." Animal Behavior Society Annual Meeting (virtual). Oral presentation.
- Aug. 2019 **Lichtenberg EM**, Heiser J^U, Baum KA, Jha S. "Resource requirements at local and landscape scales underlie trade-offs for conserving diverse pollinators." Ecological Society of America Annual Meeting (Louisville, KY). Oral presentation.
- Aug. 2019 Behr W, Simpson KM^U, **Lichtenberg EM**, Jha S, Fowler NL. "Forb responses to prescribed fire in Texas and Oklahoma." Ecological Society of America Annual Meeting (Louisville, KY). Poster.
- Jul. 2019 **Lichtenberg EM**, Gross BJ, Zilberman D, Kremen C, Lichtenberg E. "Managing pollination services: a model of substitution between wild pollinator habitat and honey bee hive rental." International Pollinator Conference (Davis, CA). Poster.

- Dec. 2018 Campbell AJ, **Lichtenberg EM**, Cabral RB, Carvalheiro LG, Coelho BTW, Freitas MAB, Oliveira FF de, Maués MM, Menezes C, Giannini TC. "Functional traits can inform tropical bee conservation but not ecosystem services." III Simpósio Brasileiro de Polinização (Botucato, Brazil). Oral presentation.

 Aug. 2018 **Lichtenberg EM**, Mendenhall CM, Brosi B. "Foraging traits drive outcomes of Neotropical stingless bee community disassembly under land use change." International Union for the Study of Social Insects Congress (Guarujá, Brazil).
- Mar. 2018 **Lichtenberg EM**. "Alternative food handling tactics and exploitation of pollination mutualisms: bumble bee nectar robbing decisions." Brain, Behavior, and Evolution Seminar, University of Texas (Austin, TX). Oral presentation.

Oral presentation.

- Jan. 2018 Bronstein J, Barker JL, **Lichtenberg EM**, Richardson LL, Irwin RE. "The behavioral ecology of nectar-robbing: how alluring is 'the Temptation to Cheat'?" American Society of Naturalists Annual Meeting (Asilomar, CA). Oral presentation.
- Aug. 2017 Lichtenberg EM, Irwin RE, Bronstein JL. "Exploitation of pollination mutualisms: Tactic constancy of nectar robbing." Ecological Society of America Annual Meeting (Portland, OR). Oral presentation
- Aug. 2017 Bronstein JL, **Lichtenberg EM**, Irwin RE. "The ecology of cheating: why nectarrob a flower more than once?" Ecological Society of America Annual Meeting (Portland, OR). Oral presentation
- Sept. 2016 **Lichtenberg EM**, Irwin RE, Bronstein JL. "Context dependency of bumble bee nectar robbing." XXV International Congress of Entomology (Orlando, FL). Oral presentation.
- Sept. 2016 Lichtenberg EM, Mendenhall CM, Brosi B. "Diet breadth impacts tropical eusocial bee species' sensitivity to forest lost." International Union for the Study of Social Insects-North America Section Colloquium (Orlando, FL). Oral presentation.
- Aug. 2016 Lichtenberg EM, Irwin RE, Bronstein JL. "Impacts of alternative food handling tactics on bee foraging efficiencies." International Society for Behavioral Ecology Conference (Exeter, UK). Oral presentation.
- Jul. 2015 **Lichtenberg EM** and Brosi BJ. "Stingless bee species' traits alter responses to deforestation." Graduate Seminar, Rocky Mountain Biological Lab (Gothic, CO). Oral presentation.
- Aug. 2014 **Lichtenberg EM**, Nieh JC. "Eavesdropping selects for conspicuous signals." International Society for Behavioral Ecology Conference (New York, NY). Oral presentation.
- Nov. 2013 **Lichtenberg EM**, Kennedy C and Crowder D. "Effects of farming practices on local and regional abundance, richness and evenness of arthropods." Entomological Society of America Annual Meeting (Austin, TX). Oral presentation.
- Aug. 2013 **Lichtenberg EM** and Brosi BJ. "Stingless bee species' traits alter responses to deforestation." 2nd International Conference on Pollinator Biology, Health and Policy (State College, PA). Oral presentation.
- Jan. 2013 **Lichtenberg EM**, Pettis JS, Andree M, Stitzinger J, Rose R and van Engelsdorp D. "Colony health implications of pollen and pesticide diversity in colonies rented

- for crop pollination." American Bee Research Conference (Hershey, PA). Oral presentation. Oct. 2012 **Lichtenberg EM**. "Eavesdropping on heterospecific recruitment pheromones facilitates efficient foraging by stingless bees." International Union for the Study of Social Insects-North America Section Meeting (Greensboro, NC). Oral presentation. Aug. 2011 **Lichtenberg EM** and Nieh JC. "Cost-effective eavesdropping between competing bee species: Empirical and theoretical support." Ecological Society of America Annual Meeting (Austin, TX). Oral presentation. July 2011 Lichtenberg EM and Nieh JC. "Fight or flight? Conflict costs drive heterospecific eavesdropping by competing stingless bees." Behavior 2011 (Bloomington, IN). Oral presentation. **Lichtenberg EM**. "Context-dependent eavesdropping by a dominant stingless Aug. 2010 bee species." International Union for the Study of Social Insects Congress (Copenhagen, Denmark). Poster. Aug. 2009 Lichtenberg EM, Imperatriz-Fonseca VL and Nieh JC. "Group foraging is beneficial for stingless bees." Ecological Society of America Annual Meeting (Albuquerque, NM). Poster. Lichtenberg EM and Nieh JC. "Risk-sensitive eavesdropping by stingless bees." June 2009 Animal Behavior Society Annual Meeting (Pirenópolis, Brazil). Oral presentation. Lichtenberg EM and Nieh JC. "Olfactory eavesdropping mediates stingless bee Nov. 2008 foraging patterns." Entomological Society of America Annual Meeting (Reno, NV). Oral presentation. Lichtenberg EM, Imperatriz-Fonseca VL and Nieh JC. "Group foraging is July 2008 beneficial for stingless bees." VIII Encontro sobre Abelhas: Biodiversidade e Uso Sustentado de Abelhas (Ribeirão Preto, Brazil). Poster. Dec. 2007 Lichtenberg EM and Nieh JC. "Stingless bee competition: dominance, aggression and coexistence in a Brazilian meliponine community." Entomological Society of America Annual Meeting (San Diego, CA). Oral presentation. Lichtenberg EM and Nieh JC. "Rethinking stingless bee competition: Mar. 2007 dominance, aggression and coexistence in a Brazilian meliponine community." Southern California Animal Behavior Symposium (Santa Barbara, CA). Oral presentation. Mar. 2006 **Lichtenberg EM** and Hallager S. "Factors affecting breeding success in captive kori bustards (Ardeotis kori)." California Animal Behavior Symposium (San Diego, CA). Oral presentation. Oct. 2005 **Lichtenberg EM** and Hallager S. "Factors affecting breeding success in captive kori bustards (Ardeotis kori)." Section of Ecology, Behavior and Evolution retreat (San Diego, CA). Oral presentation. Lichtenberg EM and Wilkinson JS. "Abdominal oscillations and status 2002-2003
 - Sciences, Baltimore, MD, October 2002. Poster.

 Animal Behavior Society Meetings, Bloomington, IN, July 2002. Poster.

• 5th Undergraduate Research Symposium in the Chemical and Biological

• Undergraduate Research Day, College Park, MD, April 2003. Oral presentation.

• Undergraduate Research Day, College Park, MD, April 2002. Poster.

discrimination in stalk-eyed flies."

MENTORSHIP

Graduate students

2024-present Hunter Messick (MS)

2022-present Avery Pearson (MS), How does land use impact plant-pollinator interactions?

- 1st place, Entomological Society of America President's Prize for best graduate student presentation, 2023
- JKG Silvey Scholarship, 2023-2024, 2024-2025
- Floyd Shafer Memorial Scholarship, 2023-2024

2021-present Robert Whyle (PhD), Social learning across insect orders

• R.B. Toulouse Scholarship, 2022-2026

2020-2023 Shannon Collins (MS), *Bottom-up impacts of grazing disturbance on ground-nesting bee assemblages*

- Lucy Braun Award for Excellence in Ecology, Ecological Society of America best poster award, 2022
- The Garden Club of America Board of Associates Centennial Pollinator Fellowship, 2022
- R.B. Toulouse Scholarship, 2021-2023

<u>Undergraduates</u> (^GNow in or completed graduate/professional school)

2021-2023 Marie Muñiz^G, "Can Bumblebees Learn from Lady Beetles?"; Distinguished Honors College Scholar

- National Science Foundation Graduate Research Fellow, 2024-2027
- Undergraduate Research Fellow, 2022-2023
- Frank C. Spencer Rural Student Scholarship, 2022
- College of Science research spotlight: https://cos.unt.edu/news/undergrad-research-spotlight-marie-l-mu%C3%B1iz
- Jaclyn Heiser "Analysis of Pollinator and Plant Diversity and Abundance Across the Southern Plains Region"; Capstone Research Project
- 2017 Kathleen Dunleavy "Bee behavior and foraging tactics while gathering nectar"
- 2016 Karen Wang^G "Does bee body size affect flower handling?"; NSF REU Project
- 2014 Laura Rafferty Horticulture Intern
- Bryla Jones "*Interactions between predators and bees on canola*"; WSU Funded Internship
- 2010-2012 Kyle Burks^G "Function and chemistry of bumble bee labial gland secretions"
- 2006 Shawn Kessler "Pattern discrimination by stingless bees"

Student committees

- 2023-2024 Mikayla Mayfield (PSM, Environmental Science, Advisor: Ed Mager) 2021-2023 Tessa Boucher (MS, Environmental Science, Advisor: Jim Bednarz)
- 2021-2023 Sara McGillewie (PhD, Biology, Advisor: David Hoeinghaus)
- 2020-2023 Alicia Dunton (PhD, Biology, Advisor: Warren Burggren)
- 2020-2022 Ashleigh Haddock (PSM, Environmental Science, Advisor: Ed Mager)
- 2020-2021 Emily Hartdegen (MS not completed, Biology, Advisor: David Hoeinghaus)

Technicians

2023-2024 Marie Muñiz, Lab Manager

2021-2023	Laura Taylor ^G , Lab Manager
2020-2021	Michelle Vohs, Lab Manager

<u>Research assistants</u> (undergraduate and post-baccalaureate; ^GNow in or completed graduate/professional school)

UNT: Landon Blakely, Viktorya Dietrich, Julia Dilley, Braeden Duffee, Isaac Eastland, Alejandra Gage^G, Christopher Graffam^G, Alyssa Kinman, John Linogao, Pablo Lopez, Jada Martinez, Monzerratt Martinez, Aidan McKinnis, Brandon Meadows, Nicholas Medina, Karla Montanez, Julian Moore, Marie Muñiz^G, Sarah Paroski, Devin Pedraza, Ethan Phillips, Brand Richter, Abbey Schedler

Other: Llewyn Blossfeld, John Bosak^G, Kelsey Brennan^G, Isabel Brofsky^G, Shannon Dang, Kayla Fillion, Emily Graber, Bridget Harter^G, Jaclyn Heiser, Hayley Hunter-Zinck^G, Rhiana Jones^G, Michael Joseph, Angie Kemsley, Shawn Kessler, Elizabeth Lopez, Hannah Niland^G, Cody Phillips^G, Laura Rafferty, Tín Rodriguez, Isaac Rubenstein^G, Kyle Simpson^G, Gavin Smetzler, Shelbie Spalding, Michael Stemkovski^G, Katie Strain^G, Savannah Troy^G, Sam Wilhelm^G, Caity Winterbottom^G, Kate Wynne^G

RESEARCH POSITIONS

2011-2015	Research Associate (part time), Dennis vanEngelsdorp (Department of
	Entomology, University of Maryland, College Park) and Jeffery Pettis (Bee
	Research Lab, Agricultural Research Service, US Department of Agriculture,
	Beltsville, MD)
2011-2013	Visiting Researcher, Department of Biology, University of Maryland, College
	Park
2005-2006	Graduate Rotation Student
	• Ronald Burton, Scripps Institute of Oceanography – molecular techniques
	• Russell Lande, University of California, San Diego – game theory
Sep. 2004	Kori Bustard Behavior Research Intern, Smithsonian National Zoological
-Aug. 2005	Society
Jan. 2001	Undergraduate Researcher, Gerald Wilkinson's lab, University of
-May 2003	Maryland, College Park
Summer 2000	Research Assistant. Gerald Borgia's lab. University of Maryland. College Park

TEACHING EXPERIENCE

T ETT CTTT	EM EMELTEE
Spring 2024	Guest Lecturer, "Developmental Integrative Biology Seminar" (BIOL
	5870.001), University of North Texas
Spring 2021	Instructor, "Environmental Science" (BIOL 1132), University of North Texas
- present	
Fall 2020	Instructor , "Behavioral Ecology" (BIOL 4005.008 & 5005.008, BIOL 4035 &
- present	5035), University of North Texas
Fall 2017	Guest Lecturer, "Topics & Skills for Grad-students in Biology" (BIO389D),
& 2018	University of Texas at Austin
Fall 2015	Mentor, "Honors Introductory Biology" (MCB181), University of Arizona
Spring 2014	Primary Instructor, "Insect Behavior" (ENTOM593), Department of
	Entomology, Washington State University
Summer 2009	Lecturer, "English for Biologists" mini-course, Faculdade de Filosofia, Ciências

Summer 2009 **Lecturer**, "English for Biologists" mini-course, Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto, Universidade de São Paulo

Summer 2008	Lecturer, "Uma Introdução a Estatísica - Análise Prática dos Dados" mini-course
	[Translated title: An Introduction to Statistics: Practical Data Analysis], Faculdade
	de Filosofia, Ciências e Letras de Ribeirão Preto, Universidade de São Paulo
Summer 2007	Lecturer, "Stingless bee competition and foraging" mini-course, Faculdade de
]	Filosofia, Ciências e Letras de Ribeirão Preto, Universidade de São Paulo
2007-2011	Teaching Assistant, Division of Biological Sciences, UCSD
•	"Biodiversity," Spring 2011; "Animal Behavior and Communication," Winter
2	2011; "Introductory Ecology: Organisms and Habitats," Fall 2008; "Biometry,"
]	Fall 2007; "Animal Behavior & Communication," Spring 2007
2003-2004	Peace Corps Volunteer Math Teacher, 8th and 9th grades, Collège de Lafou,
	Guinea, West Africa

PROFESSIONAL TRAINING

Oct. 2023	Ranching for Resilience: Linking Management Practices to Soil &
	Rangeland Health, Holistic Management International, Decatur, TX
Oct. 2022	Adaptive Grazing and Brush Management, Grassroots Carbon, Decatur, TX
Aug. 2021	Becoming a JEDI (Justice, Equity, Diversity, and Inclusion) Mentor:
	Strategies for Inclusive Mentoring. Animal Behavior Society. Online.
Summer 2021	Unlikely Allies in the Academy, University of North Texas, Denton, TX
Apr. 2020	Suicide Prevention Workshop, University of North Texas, Denton, TX
Oct. 2018	Bystander training, BeVocal, University of Texas, Austin, TX
Oct. 2018	Modern R for Data Science, Locke Data, Austin, TX
Oct. 2015	Scientific Computing Skills Workshop, University of Arizona, Tucson, AZ
Feb. 2014	Transformational Women's Leadership Symposium, Washington State
	University, Pullman, WA
Aug. 2012	Getting off the Ground with Individual-Based Modeling: A Primer for
	Instructors and Researchers, Ecological Society of America Annual Meeting
	workshop, Portland, OR
2009	The Bee Course, American Museum of Natural History, Portal, AZ
Winter 2007	Tropical Rainforest and Canopy Ecology, Institute for Tropical Ecology and
-2008	Conservation, Bocas del Toro, Panama

SCIENTIFIC MEMBERSHIPS
Animal Behavior Society; Association for Women in Science; Ecological Society of America; Entomological Society of America; International Union for the Study of Social Insects

SERVICE

Departmental/	U	nive	rsit	v
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2023-present	Member, Department of Biological Sciences Graduate
	Admissions/TA/Scholarship Committee
2023-2024	Search committee member, Department of Biological Sciences
2022-2023	Member, UNT Ricco Ethics Award Committee
2022-2023	Search committee member, College of Science
2022, 2023	Panelist, UNT Peace Corps Stories event
2022	Search committee member, Department of Biological Sciences
2021-present	Member, Department of Biological Sciences Inclusive Curriculum Working
_	Group

2020-present	Member, UNT Bee Campus USA Committee	
2016-2017	Chair, UA Postdoc Association Postdoc Guide Committee	
2016-2017	Founder and Organizer, UA EEB Statistics and R Group	
2016-2017	Postdoctoral representative, Department of Ecology and Evolutionary Biology,	
2010-2017	The University of Arizona	
2008-2010	Admissions Committee Member, Division of Biological Sciences, UCSD	
2007-2011	Graduate student liaison, Section of Ecology, Behavior and Evolution, Division	
	of Biological Sciences, UCSD	
2007-2008	Graduate Student Association Representative, UCSD	
2007 2000	Graduate Student Association Representative, 5 c.S.D.	
Workshops and Symposia		
2024	Instructor, CV Workshop, UNT College of Science	
2023	Co-organizer with undergraduate student leaders, Panel on REU, REEU, RaMP	
	programs, UNT Society for Ecological Restoration Student Chapter	
2023		
2023	Assistant, Weaving the Future of Animal Behavior: A professional-development	
	workshop for pre-tenure faculty and postdoctoral researchers in animal behavior,	
	Animal Behavior Society	
2022-present	Organizer, EEB summer seminar series at UNT	
2022	Instructor, CV workshop, Biology Grad Student Association, UNT	
2016	Organizer, Recruiting Diversity Working Group, UA Women in Natural Sciences	
2015	Organizer, Symposium, Annual Meeting of the Pacific Branch of the	
	Entomological Society of America (Symposium Title: Celebrating Pollination	
	Biology in Changing Landscapes)	
2014	Organizer, Section Symposium, Entomology 2014 (Symposium Title:	
2017		
2012 2014	Entomology's Role in Sustaining Ecosystem Services in Agroecosystems)	
2013, 2014	Instructor, CV workshop, Department of Entomology, Washington State	
	University	
2010	Organizer, English conversation practice group, Faculdade de Filosofia,	
	Ciências e Letras de Ribeirão Preto, Universidade de São Paulo	
2009-2011	Translator (French to English), Alliance Guinea	
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<u>Reviewing</u>		
2024	Grant reviewer, Southern SARE Graduate Student Grant	
2022	Grant reviewer, US Department of Agriculture	
2022	Fellowship reviewer, National Science Foundation Graduate Research	
2022	± '	
2010 2022	Fellowship Program	
2019, 2023	Grant reviewer, National Science Foundation	
2018	Grant reviewer, UK Natural Resource Environmental Council Newton Fund	
2017, 2018	Student grant reviewer, Animal Behavior Society	
2010-2011	Scholarship committee, Association for Women in Science San Diego Chapter	
2006-present	Manuscript reviewer for: Acta Ethologica, Acta Zoológica Mexicana;	
1	Agriculture, Ecosystems and Environment; Animal Behaviour; Annals of Botany;	
	Apidologie; Behavioral Ecology; Behavioral Ecology and Sociobiology;	
	Biological Conservation; Biological Control; Ecological Applications; Ecological	
	9 11	
	Entomology; Ecology and Evolution; Ecology Letters: Ethology;	
	Forests; Global Change Biology; Global Ecology and Biogeography; Journal of	
	Apicultural Research; Journal of Comparative Physiology A; Journal of	

Apicultural Research; Journal of Ecology; Journal of Economic Entomology; Journal of Pollination Ecology; Neotropical Entomology; PLOS ONE; Proceedings of the Royal Society B; Psyche; Revista Colombiana de Entomologia; Sociobiology; The Canadian Entomologist; The Science of Nature

OUTREACH AND SCIENCE EDUCATION

2021	Speaker, "Managing grasslands for pollinator conservation," Texas Master
	Naturalist 2021 Annual Meeting, online.
2021	Invited presenter, "Pollinators in grasslands: habitat requirements and
	management," Trinity Forks Chapter of the Native Plant Society of Texas, online.
2019	Invited presenter, "Pollinators in grasslands: habitat requirements and
	management," Austin Butterfly Forum, Austin, TX
2018-present	Founder and Moderator, "STEM diversity inclusion resources" Slack
	workspace (https://stemdiversityresource.slack.com/)
2018	Volunteer, Jean Andrews Lecture and Outreach Fair, Austin, TX
2015, 2016	Volunteer, "Pollinator Paradise," Arizona Insect Festival, Tucson, AZ
2014-2015	Planning Committee Member and Presenter, Improving Your Farm with
	Insects: Attracting and Managing Beneficials and Pollinators, Moscow, ID
2011-2012	Organizer, All Things Bugs (prepared part of the Entomology section for the
	2012 USA Science and Engineering Festival in Washington, D.C.)
2009	Lab host, Young Black Scholars visit to UC San Diego
2006-2011	Judge, Association of Women in Science professional society awards,
	Greater San Diego Science & Engineering Fair
2006	Mentor, Expanding Your Horizons conference, San Diego, CA

SOCIAL MEDIA

Lichtenberg EM. Jul. 2015. "Bombus mixtus robbing Mertensia ciliata flowers." YouTube video. https://www.youtube.com/watch?v=vInVsBQmT-I.

Lichtenberg EM, Kessler S (research assistant). Jun. 2014. "Stingless bees fighting over a food source." YouTube video. https://www.youtube.com/watch?v=2315f1M3pvA.

Used by instructors in undergraduate courses

Lichtenberg EM. Sep. 2013. "Tropilaelaps Mites, Part 2." Bee Informed Partnership blog. http://beeinformed.org/2013/09/tropilaelaps-mites-part-2/.

MEDIA COVERAGE

Lichtenberg EM. Jun. 2021. Research overview by Brittney Dear: https://research.unt.edu/news/bee-sustainable.

Lichtenberg EM. Jan. 2018. Interview and ongoing research discussed in the Sherman-Denison Herald Democrat: http://www.heralddemocrat.com/news/20180125/hagerman-holds-control-burn-for-wildlife-research.

Lichtenberg EM and colleagues. 2014. "Eavesdropping selects for conspicuous signals" covered by The Eastern Tribune, The Examiner, Entomology Today, Tech Times

Pettis JM, **Lichtenberg EM** and colleagues. 2013. "Crop pollination exposes honey bees to pesticides which alter their susceptibility to the gut pathogen *Nosema ceranae*" coverage included NBC, US News & World Report, Los Angeles Times, Ag Information Network, Mother Jones, University Herald, Business Week, Bloomberg News, French Tribune, TakePart (>30 outlets in total)