

Marlo Gunnar McCarter

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EDUCATION

University of California, Irvine

PhD Biological Sciences

August 2024

M.S. Biological Sciences

December 2022

University of New Mexico

B.S. Biology

May 2019

PUBLICATIONS

McCarter MG, Loudon C. (2021) Caution for mentors: Evidence for confirmation bias in measurements taken by undergraduate students in course-based research. *Perspectives on undergraduate mentoring*. (10)1.

Submitted

McCarter MG, Kellog D, Sowry S, Loudon C. Tapered insect antennae have rapid and damped return with few oscillations after perturbation (*Acheta domesticus* (L.)). (*in revision*)

McCarter MG, Loudon, C. The spatial arrangement of Böhm's bristles and resolution of joint position in cricket antennae (*Acheta domesticus* L.) (Orthoptera: Gryllidae) (*submitted*)

SKILLS

MATLAB, R, SAS, Image analysis (ImageJ, Tracker, MaxTRAQ), Field work, insect husbandry (*Acheta domesticus*, *Cicindella hirticollis*), Data visualization, Statistical modeling.

RESEARCH EXPERIENCE

Purdue University

Postdoctoral research assistant | Sept. 2024 -

University of California, Irvine

Graduate student researcher | Sept. 2019 – Sept 2024

- Conducted field work to collect insects for biomechanical testing.
- Designed and built custom experimental setups and collected data.
- Analyze large data sets and perform statistics.
- Prepare manuscripts for publication.

Museum of Southwestern Biology (UNM)

Research Technician | August 2017– May 2019

- Identified pitfall collections from after wildfire for collaborative research with NPS, into different taxonomic groups depending on study interest (Order, Family, or species).
- Used Orthoptera species data to determine diversity and species composition pre- and post-fire and at different levels of fire severity and
- Presented findings at a collaborative taskforce all hands meeting and an undergraduate symposium.

Curatorial Assistant | August 2018 – May 2019

- Assisted in maintaining and curating museum's arthropod main research collection.
- Databased specimens to SCAN (Symbiota Collections of Arthropods Network) to all use for other researchers.
- Collected and preserved tissue for DNA and stable isotope analysis by research labs at the University of New Mexico.
- Acted as docent for university students and the public. Used identification keys and previous training to identify and organize collection. Prepared specimens for curation by pinning, slide mounting, and labeling.

University of New Mexico/Sevilleta Long term ecological reserve

NSF REU student researcher | May 2018- August 2018

- Collected and catalogued the common summer species of grasshoppers at the Sevilleta LTER site.
- Used R package 'morphospace' to measure morphological features of grasshoppers in different spatial landscapes (grassland, desert, shrub).
- Dissected and used gut content to determine grasshopper species diet.

Valles Caldera National Preserve

Entomology Intern | June 2017 – August 2017

- Collected insects from Lindgren funnel traps, identified and counted the number of bark beetles (*Dendroctonus* sp.), to determine effectiveness of push-pull aggregation pheromone traps as a method of bark beetle containment.
- Collected pitfall traps and identified arthropods present.

PRESENTATIONS

TALKS

McCarter, MG, Loudon, C. (2023) Does taper of antennae influence resonance frequency? *The Entomological Society of America*. National Harbor, MD.

McCarter, MG, Loudon, C. (2022) Using simple principles to understand functional morphology of insect antennae in mechanosensation. *ESA, ESC, ESBC Joint meeting*. Vancouver, BC, Canada.

McCarter, MG, Loudon, C. (2022). Caution for mentors: Evidence for confirmation bias in measurements taken by undergraduate students in course-based research. *The Society for Integrative and Comparative Biology*. Phoenix AZ

McCarter, MG, Loudon, C. (2021). Damping affects the rapid return of cricket antennae. *The Entomological Society of America*. Denver, CO

McCarter, MG, Loudon, C. (2021) Rapid recoil of filiform antennae. *The Society for Integrative and Comparative Biology*. Virtual

McCarter, MG, Loudon, C. (2020). Rapid recoil of filiform antennae. *The Entomological Society of America*. Virtual

POSTERS

McCarter, MG, Loudon, C. (2020) Mechanical damping of cricket antennae. *Society for integrative and comparative biology*. Austin, TX

McCarter, MG, Loudon, C. (2019) Mechanical damping of cricket antennae. *The Entomological Society of America*. St. Louis, MS

McCarter, MG, Ward, M.A. (2018). Response of Grasshopper and Crickets to Low severity Wildfire in Ponderosa Pine Forest. *University of New Mexico Research Days*. Albuquerque, NM

McCarter, MG, Ward, M.A. (2018). Response of Grasshopper and Crickets to Low severity Wildfire in Ponderosa Pine Forest. *Southwest Jemez Mountain Collaborative Forest Landscape Restoration Program: All hands meeting*. Santa Fe, NM

TEACHING & MENTORSHIP

Mentor, UROP Research Discovery Program University of California Irvine

Winter 2023

- Group meeting with 4 mentees to discuss seminars and panels and foster undergraduate networking (4 meetings/quarter). Individual meetings with 4 mentees, 2/ quarter to discuss personal goals, questions/concerns

and develop a personalized mentoring relationship.

Teaching assistant, University of California Irvine

Fall 2019 – Current

Bio Sci 94H: Honors from Organisms to Ecosystems (W '23)

- Led two discussions/week of 20-30 students. Prepared weekly activities for discussions and provided exam preparation. Provided support through virtual channels and office hours.

Image Analysis (W '20, SS1 '20, SS2 '20, W '21, F'21, SS2 '22, F '22, S' 24)

- Facilitated or co-facilitated lab of 24-40 students per quarter and provide learning assistance. Led labs on thermal camera imaging, use of software for image analysis (ArcGIS, ImageJ/FIJI, Tracker).
- Collaborated with the professor in developing activities to meet course learning objectives and later to develop online alternatives to activities during pandemic year(s).

Bio Sci 93: DNA to Organism (F '19)

- Facilitated 3 discussions/week of ~25 students.

Human physiology (F '20, S '23, F '23, W '24)

- Prepared and graded exams in online lecture format using Canvas.
- Provided support to students with office hours and online discussion threads.

Physiology laboratory (W '19, S '20, S '21)

- Facilitated two, twenty-four student lab sections per quarter. Led labs in statistical and data analysis, animal dissections, collection of physiological measurements using BioPac equipment.
- Graded weekly assignments, lab reports and exams.

GRANTS, FELLOWSHIPS, AWARDS

- Semi-finalist, UCI Grad Slam competition
- Graduate Dean's Dissertation Fellowship – UC Irvine graduate division
- 2nd place president's graduate talk award – Entomological Society
- Grants in aid of Research – Sigma Xi
- Graduate Assistance in Areas of National Need Fellow – UC Irvine EEB
- Diversity Recruitment Fellowship – UC Irvine
- Minority Serving Institution Enhancement Award, UC Irvine
- NSF Research Experience for Undergraduates

OUTREACH & VOLUNTEERING

- Presentation judge – UCI Undergraduate Research Opportunities Symposium **Spring 2023**
- Student representative – UCI Diverse Educational Community & Doctoral Experience UCI **Fall 2021 - Current**
- Mentor – Application Assistance Program Advancement of Women in Science (AWIS) **Fall 2020**
- Committee member & Host “What can I do with my PhD?” speaker panel – UCI EEB **Spring 2022**
- Co-leader and co-developer MATLAB coding workshop – UCI EEB **Fall 2021**
- Scientist Pen Pal – Letters to a pre-scientist **Fall 2020 – Summer 2021**
- Small rodent survey volunteer – Sevilleta National Wildlife Refuge **July 2019**

ADDITIONAL TRAINING

Professional advancement career training (PACT), Entomological Society of America	Spring 2023
Mentoring Excellence, UCI Grad division certificate	Winter 2022
Machine Learning with MATLAB, MathWorks	Winter 2024
Signal processing with MATLAB, MathWorks	Winter 2024