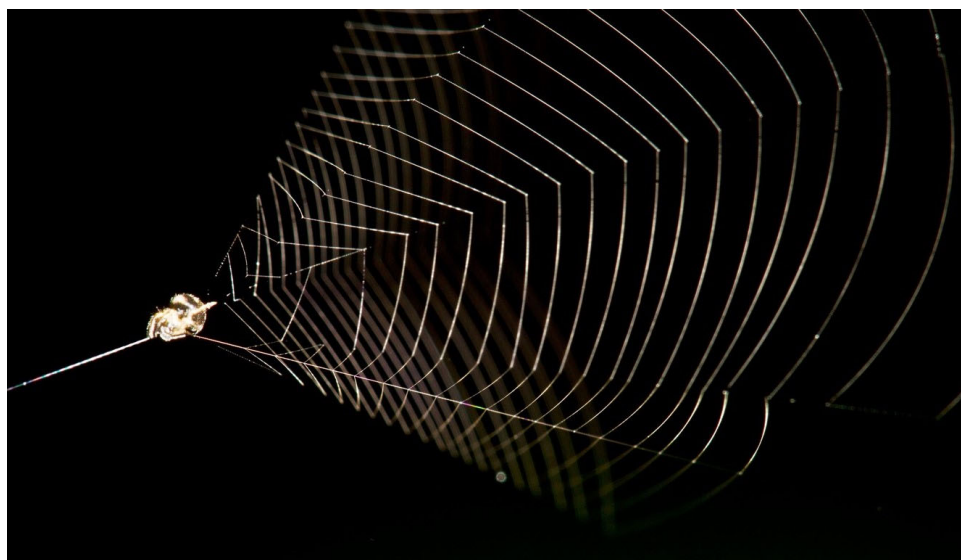


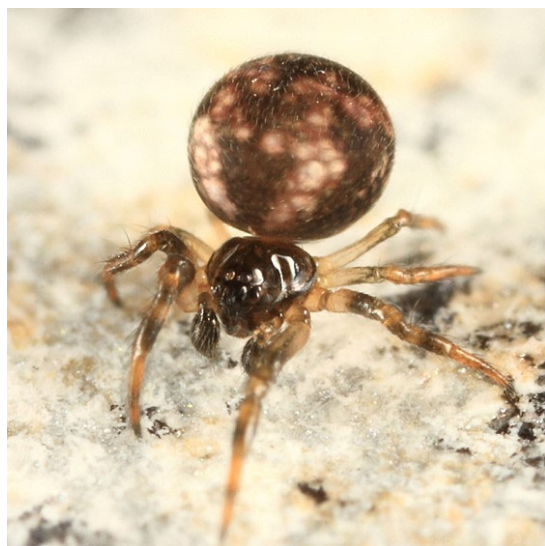
Tiered Mentoring Program

“Good vibrations”: exploring web shape and prey detection in slingshot spiders

Dr. Todd Blackledge and Alissa Coonfield



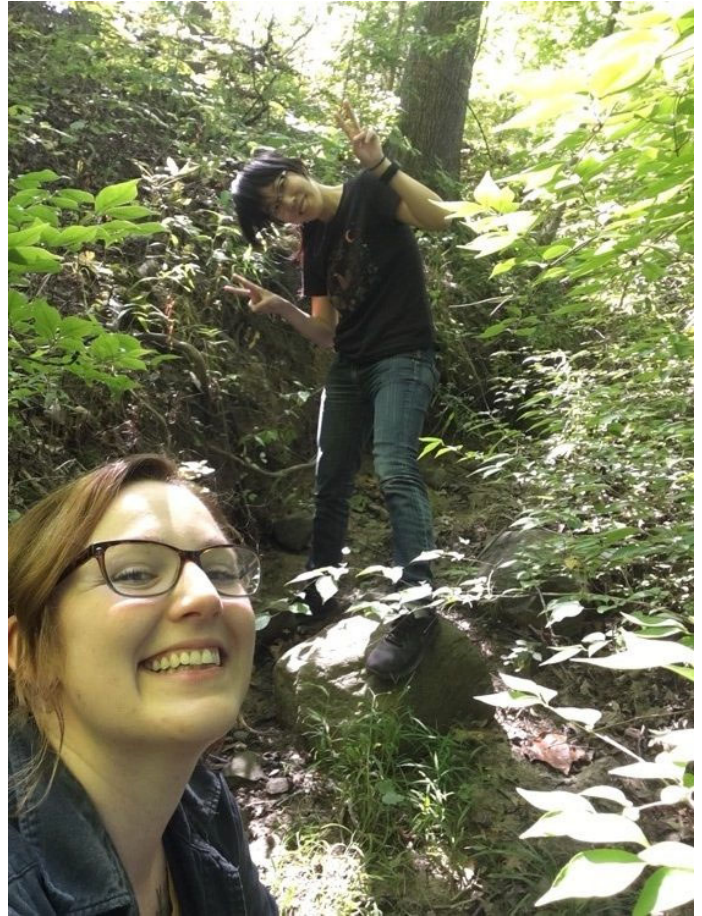
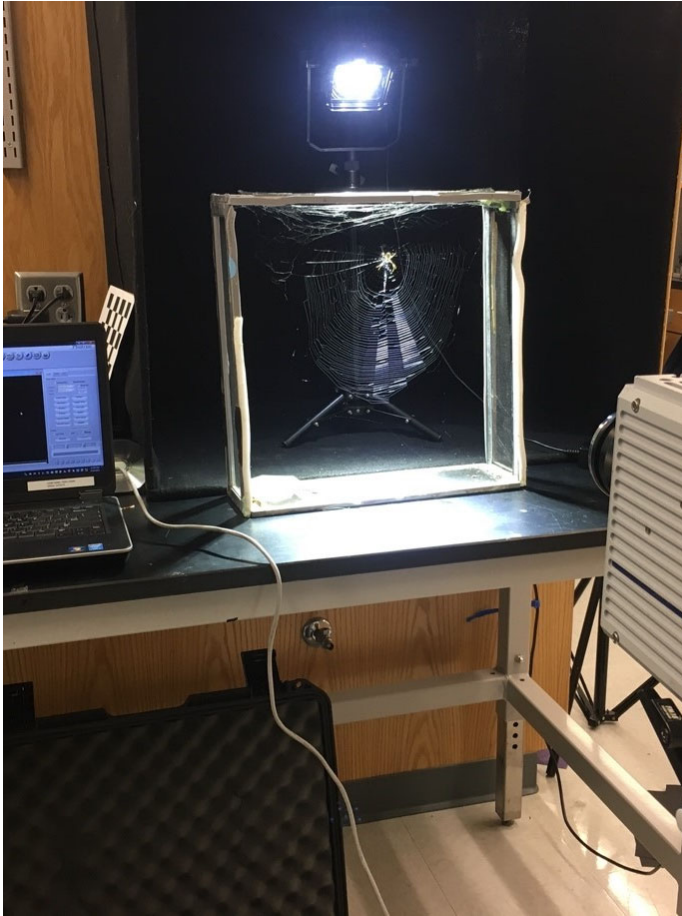
Vibrations are incredibly useful to spiders—it's through vibrations that spiders are able to detect and locate prey, communicate with each other, and perceive their immediate surroundings. Many spiders rely on the webs they build to transmit this information, and the properties of those webs determine how quickly and efficiently they can detect and respond to different signals.



The slingshot spider (genus *Theridiosoma*) builds an orb-shaped web which it tightens from the center, transforming it into a conical, energy-loaded snare. When it detects flying prey, the spider launches the structure forward, intercepting any insects in its path.

The unique characteristics of this system—the web shape, the active prey capture mechanism, and the spider's ability to detect prey before the web touches

it—make it ideal for studying vibration transmission. In this project, I aim to determine 1) how the three-dimensional shape of Theridiosoma webs may aid in transmitting vibrations and 2) the mechanism through which the spider detects its prey (either through airborne or web-borne vibrations).



In this project, you'll gain experience with...

- Field- and lab-based research
- Invertebrate collection and care
- High-speed videography and vibration-monitoring techniques
- Mechanical testing and material science
- Spider biology and behavior
- Physics of vibration
- Statistical analysis and data interpretation
- Presentation in a professional setting and/or publication

[Click here for more information about Dr. Blackledge's research.](#)