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The Spectral Ecology Summer School

Written by Kyla Dahlin, Associate Professor at Michigan State University



The Spectral Ecology Summer School (SPEC School), launched by Michigan State University associate professor Kyla Dahlin, is designed for graduate students and postdoctoral researchers from around the US who are interested in integrating remote sensing tools into their ecological research. Inspired by well-known field courses in ecology, SPEC School offers hands-on training in airborne remote sensing data through the National Ecological Observatory Network's Airborne Observation Platform (NEON AOP).

The program also emphasizes inclusive leadership, providing participants with opportunities to explore community-oriented leadership in scientific spaces. In addition to technical instruction, the program focuses on leadership development, recognizing that early-career researchers often enter roles that demand skills beyond scientific expertise. Participants gain

experience in fieldwork, data analysis, and collaborative research while building a foundation for more effective scientific leadership. SPEC School has quickly become a valuable experience for those looking to deepen their understanding of ecological remote sensing while connecting with a broader, supportive research community.

MLBS is an ideal location due to its ecological diversity, excellent infrastructure, and connection to NEON. NEON is a network of 81 field sites around the United States; the sites range from university field stations like MLBS, to privately held reserves and public lands. The sites were selected with the aim of collecting consistent ecological observations across a wide range of geographic variability over a 30-year period. Funded by the US National Science Foundation (NSF), NEON scientists and technicians collect nearly 200 different types of ecological data, from the AOP data that Dr. Dahlin uses extensively, to information on insects, small mammals, and water quality.

SPEC School is primarily funded through a prestigious NSF CAREER grant awarded to Dr. Dahlin, with additional support from industry partners and donors. To allow participation from institutions across the US, SPEC School covers travel, housing, and other costs for selected participants. So far 51 graduate students and postdocs have participated in SPEC School. 2025 was the third year, with another round planned for 2026. More information is available at www.specschool.org

From the Director	2
Research Spotlight	2
Student Corner	3
REU Spotlight	3
News & Notes	4



View from NEON Flux Tower

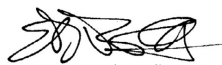
From the Director

Whatever your opinions about it, there is no denying that the world is becoming ever more permeated by a digital reality with ubiquitous screens, inescapable recordings, and the crutch of artificial intelligence a click away. Whether in a classroom, at an art exhibit, a concert, or a sporting event, people are as likely to be immersed in their own screen as engaged in the moment they are ostensibly there for. Scholars debate the long term impacts, but consistently point to a general reduction in critical thinking and interpersonal skills, epitomized by the now inescapable Gen Z stare.

This surging tide of a virtual reality makes me all the more appreciative of what we have and offer at Mountain Lake. A number of recent studies have highlighted the essential contributions of field experiences to personal growth and learning. Facing real world complexity and unpredictability exposes students to problems without clear answers, forcing them to analyze, synthesize and evaluate rather than simply recalling facts or talking points. Practicing observation and data collection emphasizes the connection between evidence and interpretation, which builds the ability to make justified conclusions. Reflection on daily experiences, either alone or in conversation with others, forces people to examine their assumptions and reasoning and build their own self-awareness. The collaborative context of field classes and research teams teaches the value of civil debate and negotiation, along with the joy of shared discovery.

While MLBS is by no means isolated from the digital world (in fact, our recent internet and wireless upgrades have us exceptionally well linked), we do maintain a social fabric and environmental connection that is hard to find in the present day. Whether it's sharing meals in the dining hall, late night bonfires, the annual boat race, or class and research forays into the forests and rivers, the MLBS experience provides endless opportunities to make those personal and natural connections that are so critical to personal and community well-being. We're grateful to be able to share the Station with so many of you!

Butch Brodie




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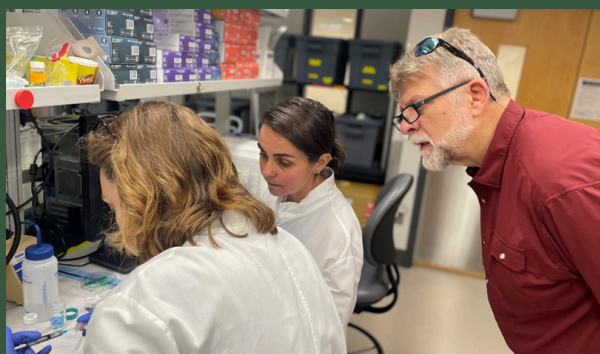
Research Spotlight - Clara Stahlmann Roeder

My collaboration with Dr. Chloé Lahondère began, as many fruitful collaborations do, with amazement and a hint of jealousy as I listened to her present her research at the MLBS Summer Seminar Series. She was talking about her work measuring mosquito perception of volatile chemicals using electroantennography, mounting mosquito heads between electrodes to record the minute electrical signals their antennae generate in response to scent compounds. I remember peppering her with questions at the reception afterward, trying to figure how I could bring her interdisciplinary approach to my own research questions.



My dissertation focuses on social behavior in forked fungus beetles, but I lacked critical knowledge about their chemical communication. That gap was exactly where Dr. Lahondère stepped in with the methods and expertise of a chemical ecologist. On the porch of the Director's Cottage, we sketched out possible projects examining whether the chemical composition of male pheromones changes with age or social experience.

Over the past three years we've adapted techniques for scent collection and analysis to work for the forked fungus beetles. Our work combines both high-tech chemistry tools like gas chromatography-mass spectrometry and scrappy field work methods incorporating oven bags, aluminum foil, and Ziploc bags. I have found a second scientific home in the Lahondère lab at Virginia Tech. This fall, I'm using electroantennography to test what compounds forked fungus beetles can perceive - the very same technique Dr. Lahondère described in that first talk. Thanks to her mentorship and generosity, and to the MLBS culture of collaboration, I am becoming a scientist my past self would be a little jealous of.



Student Corner:

It runs in the family! Mother and daughter share a love of natural history!

Dareen Aloudeh, UVA Student (mother of Laila Sheikh): Field Herpetology & Field Biology of Insects

This summer I joined the sessions at Mountain Lake, where I explored both classroom learning and hands-on fieldwork. I have always been curious about studying nature, and this experience showed me how powerful it can be to connect lectures with what we observed outdoors. From the very first days, the lessons tied directly to our field experiences, and that made the learning come alive.

I had heard about these courses before, but being part of them was completely different. I wasn't just sitting in a classroom writing notes, I was walking into forests, entering caves, and discovering how much confidence comes when you step into nature. At first there was fear, but slowly it turned into trust in ourselves. Whether it was hiking alone, observing snakes we once feared, or telling apart different species, every moment built new skills. I learned how to recognize the dangerous from the safe, how ecosystems depend on each part to survive, and how to respect the balance of the natural world.

Another part that stood out was the community. I met scientists and teachers from across the U.S., learned from their research, and shared meals and late night fieldwork with other students. It wasn't just classes, it was living and working side by side, which gave me a new perspective on collaboration and learning. Being close to the instructors and staff also

showed me a way of life that felt simple and connected to nature. This experience was unique and unforgettable, and it taught me that education doesn't just happen in large lecture halls. It happens in the field, in discussions with people from different backgrounds, and in the quiet moments of observing the world around us. Mountain Lake gave me independence, confidence, and a new appreciation for how deeply I can learn when I am immersed in nature. It's something I'll carry with me long my life journey.

I will continue using the resources I was provided with and the people I have met to keep learning and expanding my understanding of ecology.



Laila Sheikh, VCU Student (daughter of Dareen Aloudeh): Field Biology of Fishes

This summer I had the opportunity to take Field Biology of Fishes at Mountain Lake, where we studied fish diversity across five different drainages in Virginia. Each day we traveled to new streams, learned about fish habitats, and used snorkeling to observe their natural behaviors up close. At first, all the fishes looked similar to me, but over time I began to appreciate even the smallest differences between species. It was an immersive and challenging field class, and one of the most rewarding academic experiences I've had.

Beyond the science, what made the course unforgettable was the community and lifestyle at Mountain Lake. I met incredible people—students from UVA and professors from across the country—and quickly felt at home on the mountain. Some of my favorite memories include our class camping trip with a bonfire, and attending a seminar together to watch our professor present. Mountain Lake truly felt like a second home, and I left with both new scientific skills and lasting friendships. I can't wait for the chance to return and continue exploring the research and opportunities this unique place offers.

REU Spotlight - Anna Tieman

Living on top of a mountain all summer surrounded by beautiful wilderness is objectively cool. But being an REU student at MLBS made the experience of living on a mountain even cooler. We kicked off the first week of the REU program with a Fundamentals of Field Biology workshop that was led by my mentor, Dr. Corlett Wood, and that is when I first encountered the mysterious black spots. As part of the workshop, we sampled a common clover (the black medic) around the Station to gain valuable skills in designing and conducting scientific research in the field. We were originally interested in examining the prevalence of anti-herbivore defense mechanisms called trichomes, but found that much of the clover exhibited little black spots. I was intrigued by

what could be making these spots and so began my REU project.

Through my project I was able to characterize the culprit for these black spots as a plant fungal pathogen and ask questions about how other species interactions may impact fungal infection. Being at the Station this summer put me in a unique position to answer questions about this fungal pathogen - both in the lab and field settings - and even allowed me to integrate my interests in molecular biology to solve this mystery using DNA sequencing. I had an amazing time at the Station, and my peers were so much fun! Every corner you turn at MLBS there is something to learn and someone excited to help you learn about it.



News & Notes

Annual OBFS Meeting

MLBS is pleased to be a member of the Organization of Biological Field Stations, which is composed of field stations and marine labs from around the globe. This year's annual OBFS meeting was held at Rocky Mountain Biological Laboratory in Gothic, Colorado, just as the aspen trees began turning gold. The meeting included a wide variety of workshops, concurrent sessions, speakers, field trips, and tours that inspired and empowered attendees with ideas to take back to their home stations. Perhaps most inspiring of all were conversations with colleagues from field stations near and far. Many thanks to the countless folks who helped make the event memorable and impactful! Visit OBFS.org to learn more about the organization's mission, activities, and membership (available to stations and individuals).



Watch Your Step

American Chestnut trees, once abundant in our forests, rarely survive long enough to produce fruits due to a fungal blight introduced to the United States in the early 1900s. Young trees still emerge as root sprouts from the old giants, and those small individuals are easily found in the Station's woods. One tree at MLBS has continued to mature, and has now produced fruit for several years. Station users have enjoyed finding its spiky husks on the forest floor this fall. Unfortunately this tree is also infected with the fungus and will likely succumb to it before long.



Nominate a Rising Star

Do you know a post-doc or junior faculty who is an up-and-coming scientist in field biology? Nominate them for our Rising Stars in Field Biology Seminar Series! The Rising Star seminar series was developed to amplify the research of early career biologists, and promote networking and research opportunities for them at MLBS. We are seeking nominees who are conducting research in evolution, ecology, behavior, or related fields and have a strong emphasis on field biology. Individuals with the potential to be positive role models for junior scientists (e.g., undergraduate and graduate students, lab technicians, postdocs) would be strong nominees! In addition to showcasing their work, we are particularly eager to invite speakers interested in exploring new research opportunities at MLBS.

Submit your nomination(s) by 11:59 PM (EST) on January 16 using [this form](#). If you have any questions, please contact Dr. Corlett Wood (corlett@sas.upenn.edu).



Aviary Upgrade

The MLBS aviaries received a welcome upgrade in 2025. Originally built decades ago, the field enclosures have served as short term housing for studies of song birds. Time and the mountain climate had taken their toll, and the aviaries had not housed birds in several years. With the help of the university Animal Care & Use Committee (ACUC), the aging structures were rebuilt during the last offseason and are now institutionally approved and ready to support avian research again!



MLBS Open House

Each summer the Station opens its gates to visitors for the annual MLBS Open House - one amazing afternoon of fun, learning, and outdoor exploration with MLBS researchers and artists. Visitors get a taste of Salt Pond Mountain and a glimpse of the work being done here, and Mountain Lakers get a chance to share their art and science with the public. It's a rewarding experience for everyone involved, and something MLBS looks forward to every year!

A Look Back at the 2025 Season...

Station Users

6,264 total user days

- 489 individuals from 54 institutions
- 123 faculty/staff/researchers
- 9 postdocs
- 104 undergraduate students
- 93 graduate students
- 18 k-12 students
- 16 k-12 educators
- 44 guests/family members
- 7 artists
- 75 other visiting group/program participants

REU Participants

- Madeline Paczkowski
- Miles Appleton
- Ray Kennedy
- Iris Schmeder
- Oskar Golwala
- Samantha Hickman
- Anna Tieman
- Ellen Lan
- Landon Schuster
- Clara Kendrick

Financial

\$30,103 in fellowships awarded to:

- 5 course students
- 6 researchers
- 5 workshop attendees

Station Projects

- 6 cottage exteriors painted
- Invasive plant removal
- Mammal and avian collections moved to Wilbur Lab
- Trail maintenance

Summer Courses

- Field Herpetology
- Field Biology of Fishes
- Field Biology of Insects



Internships and Professional Programs

- Research Experiences for Undergraduates
- ArtLab Artists-in-Residence
- Grant Writing Workshop
- Evolutionary Biology Graduate Student Workshop

Visiting Courses and Programs

- Hanover College Herpetology class
- Monticello High School field research trip
- Wilderness First Aid
- Virginia Tech geosciences department retreat
- SPARCnet RAMP
- SPEC School
- Evolutionary Quantitative Genetics Workshop
- Evolution Education Teacher Workshop
- Dendrochronology Field School
- Virginia Institute of Marine Science
- Hampton University Field Trip
- New River Valley Master Naturalists Field Trip
- Tour for Ecological Forecasting Initiative Conference

Station Activities

- 4th of July Festivities
- Volleyball Tournament
- Gourmet S'mores Cook-off
- Open House
- Movie Nights
- SciArt Night: Glass Etching
- Intro to Swing Dancing
- Karaoke Night
- Trivia Night
- R Users tutorial on GLMMs
- Night Lighting for Insects



Photo by Ray Kennedy/Iris Schmeder



Who We Are

Butch Brodie, Director
bbrodie@virginia.edu

Sandy Kawano, Associate Director
brr3phe@virginia.edu

Megan Champion, Department Manager
mcc8te@virginia.edu

Jaime Jones, Station Manager
jjones@virginia.edu

Chris Moye, Facilities Superintendent
fhb8ae@virginia.edu

Contact Us

University of Virginia
Mountain Lake Biological Station
mlbs@virginia.edu

UVA Grounds Office
PO Box 400327
Charlottesville, VA 22904
(434) 982-5486 o

Station Office
240 Salt Pond Circle
Pembroke, VA 24136
(540) 626-7196 o
(540) 626-5229 f



**MOUNTAIN
LAKE** BIOLOGICAL
STATION

Research Programs

- Red-backed salamander coverboard surveys
- Comparative physiology of fishes and salamanders
- Impacts of the evolution of social behavior on brain cell numbers in insects
- Investigating Color Vision in Ruby-throated Hummingbirds
- Host-Seeking, Feeding Habits, and Pathogen Transmission in *Culex territans*
- National Ecological Observatory Network
- Effects of arginine vasotocin on agonistic behavior across darter species with evolved differences in territoriality and care
- Fungal Diversity Survey
- Observation and modeling of atmospheric boundary-layer temperature and moisture budgets at Mountain Lake, Virginia
- Remote camera trapping in and around MLBS
- Wind and turbulence structure of the lower atmosphere above MLBS
- Quantification of Red Spruce Reference Conditions
- Evolution of social behavior in *Bolitotherus cornutus* (forked fungus beetle)
- Natural selection on leaf defensive hairs
- Studying variation in sexual selection on male forked fungus beetles
- Social behavior of forked fungus beetle
- Exploring species interactions in forked fungus beetle, *Amianthium*, and others
- Dispersers of *Trillium undulatum*
- *Silene* census
- Chromosomal Variation in *Claytonia virginica*
- Field studies on Virginia violets
- Wind and turbulence structure of the lower atmosphere above MLBS
- Annual census for Junco project
- Fitness consequences of age structure in forked fungus beetles (*Bolitotherus cornutus*)



A list of publications related to MLBS are housed in a searchable [Zotero database](#)