

Bugged

MSU DEPARTMENT OF ENTOMOLOGY

MICHIGAN STATE UNIVERSITY



Photo by Bill Ravlin, MSU Entomology

FROM THE CHAIR

Spring is reluctantly coming to East Lansing and with it, high expectations to move beyond at least some pandemic constraints. MSU is working to transition back to in-person classes, meetings and business operations. However, I anticipate several of the remote approaches will continue and become part of our standard way to do business. Zoom meetings get old after a while, but they sure shorten the commute for meetings! We'll see how it all sorts out. I wonder what my office looks like?

We have an absolutely great group of students with no

shortage of leaders and leadership. Their most recent accomplishment is the development of a summer internship program targeting junior college students. We'll start with a modest program and go from there. They already had over 50 applicants for this program including several from out of state.

The first phase of the Entomology Research and Outreach Fellowship Program (EROF) will bring three to five fellows to learn with MSU Entomology this summer. We will provide them with competitive wages, supplies, equipment and other resources to succeed. Well done, entomologists!

In the last issue of Bugged, I mentioned establishing the Pollinator Performance Center on south campus on College Road across from the MSU dairy farm. We recently received approval to inhabit the buildings and are now working with MSU Infrastructure, Planning and Facilities and also Landscape Services to do a spring planting of literally hundreds of trees and shrubs for our pollinators. It's a great collaboration between Entomology, Landscape Services and the College of Agriculture and Natural Resources.

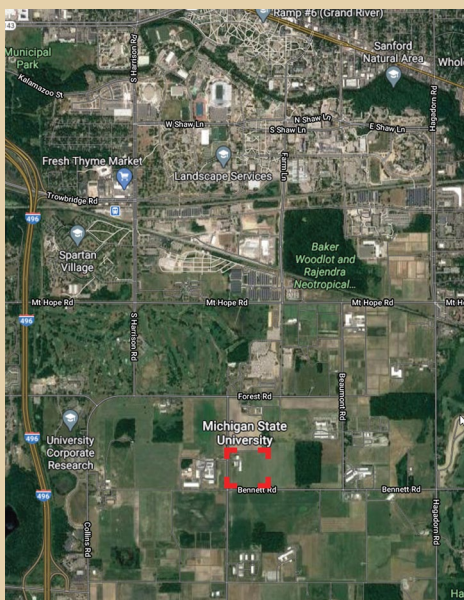
You may remember last spring we were in the middle of a chairperson search and were forced to put the process on pause for the year. Beginning this March, we're renewing our efforts, but are still in the early phases. In that respect, I will remain as chairperson through the academic year with the expectation we'll have a new person in the fall. Stay tuned!

Despite a challenging and "interesting" year, we were incredibly productive. More than ever, we appreciate our strong support from alumni, friends and collaborators. Thank you!

Bill Ravlin,
Chairperson



Establishing MSU's Pollinator Performance Center! At left, red markings indicate the location on south campus. This spring, a pollinator-friendly tree/shrub buffer strip will be planted around the 15-acre site.



RESEARCH & PROJECTS

A team of researchers from Michigan State University has received a USDA NIFA \$325,000 grant to examine effectiveness and cost of new blueberry integrated pest management approaches. Entomology professor [Rufus Isaacs](#) leads the team that also includes assistant professor [Marisol Quintanilla](#), assistant professor Matthew Gammans from the Department of Agricultural, Food and Resource Economics and MSU Extension educator and Entomology alumni [Carlos Garcia-Salazar](#). Read more about this multi-faceted project: [MSU research team receives USDA grant to evaluate effectiveness, cost of new blueberry pest management strategies](#).

Assistant professor [Marisol Quintanilla](#) is leading a team in another USDA NIFA \$300,000 project to improve methods to identify and distinguish between two lesion nematodes, *Pratylenchus penetrans* and *P. neglectus*. Preliminary research showed these two species have different reproduction methods and their populations flourish at a different pace depending on the host crop (e.g., carrots, wheat). The two species of nematodes are reducing carrot and wheat yields in many top producing states. In Michigan carrot fields, *P. penetrans* reduces yields up to 50%, while in the Pacific Northwest, *P. neglectus* causes 36% loss of wheat yields.

Assistant professor [Henry Chung](#)'s molecular lab will contribute to improving identification of the two species. With accurate identification and an improved understanding of underlying causes for different damage levels by each species, the researchers aim to offer farmers accurate damage thresholds and alternative methods of control.



Postdoctoral researcher [Elias Bloom](#) and associate professor [Zsofia Szendrei](#) led a team in evaluating if fungicide and insecticide use posed a hazard to wild and honey bees and whether pesticide use in one cucurbit field and surrounding crop fields combined to influenced bee visitation to crop flowers. These combinations of pesticides are particularly important because mixtures of pesticides can interact, or synergize, to cause greater harm to bees than single pesticides used alone.

Their findings were recently published in the Journal of Applied Ecology, "[Synergism between local- and landscape-level pesticides reduces wild bee floral visitation in pollinator-dependent crops](#)."



At left, Elisabeth Darling, Sita Thapa and Marisol Quintanilla. Right, Henry Chung.

PEOPLE

Associate professor [Zsofia Szendrei](#) recently became the co-editor-in-chief of ESA's American Entomologist journal. Szendrei



will serve as co-editor-in-chief in 2021 alongside current editor-in-chief Kevin Steffey, who will step down at the end of the year. "American Entomologist is a dynamic publication with uniquely broad appeal in the field of insect science, and Dr. Szendrei is a dynamic scientist and communicator who will steer the magazine to continued success and innovation," said ESA President Michelle Smith.

In February, assistant professor [Meghan Milbrath](#) presented to the Michigan Senate Environmental Quality Committee on the challenges sprays for eastern equine encephalitis cause for Michigan beekeepers. The committee was reviewing Senate Bill 136 - Emergency Pesticide Spraying Alert System. Her comments helped provide context for why it would be helpful to inform beekeepers of these pesticide applications.

LARRY GUT OUTSTANDING FACULTY

Professor [Larry Gut](#) is one of 10 faculty being recognized with the prestigious MSU Beal Outstanding Faculty Award for dedication and innovation in research, extension and teaching by the MSU Office of the Provost. Gut is known in Michigan and throughout the world for his environmentally friendly, science-based approaches for integrated pest management in orchards.

Since joining MSU in 1997, Gut has built a reputation of using the scientific method to develop a deep understanding of the biology of insect pests that threaten orchard crops and then using that knowledge to reduce their economic impacts. Through his innovative studies on the behavior and ecology of these insects combined with applied research across Michigan, he has become an internationally recognized expert on orchard pest management.

In particular, Gut's team of students and collaborators has developed novel insights into how moths communicate using sex pheromones, then used this knowledge to design more effective, economical and environmentally friendly strategies to protect Michigan's multibillion-dollar fruit tree industry.

His research on codling moth, a key pest of global apple and pear production, has elucidated how this insect can best be controlled using its own sex pheromone. In a recent new direction, his team is testing drone-based release of sterile insects across Michigan orchards to further reduce pest damage.

New invasive pests have also threatened Michigan orchard crops, and Gut has been at the forefront of monitoring for early detection as well as mounting



the response to invasion by these pests by developing attract-and-kill strategies that reduce pesticide use.

Gut has been dedicated to extending information through printed and electronic guides to disseminate his research-based recommendations to growers. He has annually led multiple workshops, meetings at grower farms and presentations at MSU Extension events. Gut's teaching focus has been on training the next generation of applied entomologists, mentoring seven postdocs, eight doctoral candidates and 10 master's students, while also serving on 13 thesis and dissertation committees.

Gut served as associate chair of the Department of Entomology and as chair of the CANR Promotion and Tenure committee. He has also served on 11 national or international committees and boards advancing sustainable pest management goals. Gut has an exceptional record of service to MSU Extension, through search committees, mentoring extension colleagues, and through his published works. This includes annual updates of the Michigan Fruit Management Guide that lists all the insecticides labeled in Michigan for insect pest control, based on the trials conducted each year.

Kurt Stepnitz, MSU Photography

CHEERS FOR OUR NEW GRADUATES!

Entomology celebrated this fall with three graduates earning their Masters of Science in Entomology:

- **Olivia Simaz** was advised by assistant professor Marianna Szűcs. She is now a greenhouse pest manager at a medical cannabis facility in St. Louis, Missouri.
- **Louise Labbate** was a student with professor Deb McCullough and is currently working in the McCullough lab developing outreach materials on forest insects.
- **Olivia Morris** was also advised by McCullough and is working for USDA-APHIS inspecting egg facilities and farms.

Congratulations to these fall graduates:

- **Kelton Burch** earned a Bachelor of Science in Entomology and is exploring graduate school possibilities.
- **Brenna Jeffs** graduated with a Bachelor of Science in Entomology and is looking for a position in entomology outreach.
- **Kelsi Kroll** graduated with a minor in Entomology.
- **Lauren Stiffler** earned a Bachelor of Science in Entomology through the College of Lyman Briggs. She began a job with Bayer Crop Sciences in St. Louis in March.



Book fosters honest discussion and leadership by graduate students

The passion to make a difference and be different runs deep in our Entomology graduate students. As part of their graduate student Diversity, Equity and Inclusion (DEI) discussion group, they read and discussed the book “The Privileged Poor: How Elite Colleges Are Failing Disadvantaged Students” by Harvard professor Anthony Abraham Jack.

One of the student’s tweeted about the experience, tagging author Jack who retweeted the post. The interaction on Twitter was noticed by the publisher, Harvard University Press, which posted a blog story about the MSU group and another book club at Eastern Carolina University. Both groups are grappling with understanding the challenges of racial inequity, social class and educational experience for students arriving on campus.

Further contact with the author inspired the students to find funding for an online event including time with Jack to discuss possible actions to improve disparities for low-income students at MSU. After receiving a Creating Inclusive Excellence Grant from MSU’s Office for Inclusion and Intercultural Initiatives, the online event became a reality on March 17.

The keynote address was “Socioeconomic equity in higher education during the time of COVID-19: A conversation with Dr. Anthony Jack.” Attendees came from nine different MSU colleges and institutes, K-12 education in Michigan and wildlife management agencies, demonstrating the need for conversations like these.



Above, some of the initial students who discussed Anthony Jack’s book. Below, Dan Turner writes about the event and initiatives stemming from their discussions.

A student perspective: Event exploring socioeconomic equity in higher education

by Dan Turner

In the words of our speaker, Dr. Anthony Abraham Jack, “Access ain’t inclusion.” Universities, including Michigan State University, boast admission demographics without enough focus on inclusion for their lower-income and first-generation students so they can participate fully in undergraduate life and success. For our university to ameliorate some of the strongest barriers to success for these students, frank conversations with experts are required.

That’s why the Graduate and Undergraduate Entomology Student Society (GUESS) in collaboration with the [CANR Office of Diversity, Equity, and Inclusion](#) (ODEI) invited Jack for an afternoon of virtual events with students, faculty and staff.

Jack spoke frequently of the “hidden curriculum” in academic environments—a curriculum where the students who know when and where to make the right moves get ahead. This curriculum is based not just on who you know, but how well they know you; it is not based on meritocracy but knowledge of how to forge connections with

professors and administrators who can elevate a student’s status in a stratified academic world. Jack’s talking points came from both his research and life experience. The fervor through which he advocates for students inspired us to keep opening doors for more students.

Some may wonder why entomology students wanted to bring a sociologist to speak on socioeconomic equity in higher education. For too long, entomology has largely been limited to those who knew to reach out to that professor to ask for an undergraduate research opportunity, who knew to go to office hours for that stellar letter of recommendation, who could afford to drive or fly long distances to remote places for eye-catching lines on a CV, and who could pass up a better-paying summer job working at home to work in a lab on campus. We want to see faculty and administrators expand inclusion for students.

This event is just one step in that direction. We hope this and other student and Department initiatives like this summer’s [Entomology Research and Outreach Fellowship program](#), which recruits undergraduates from institutions with limited research opportunities, promote both access to *and* inclusion in academia’s opportunities. We will create an entomology community that represents and consists of the diverse communities we seek to serve.

FEATURED STUDENTS



ANDREW JONES
UNDERGRADUATE STUDENT

Hometown:
Holland, MI

Future plans:
Graduate school and I have always wanted to work in research.

Hometown:
Clarkston, MI

Previous education: BS in environmental biology/zoology, minor in entomology at MSU

Major professor:
Rufus Isaacs



JENNA WALTERS
GRADUATE STUDENT

What inspired your interest in entomology? The insects themselves, their specialization to the environment is phenomenal. The ability to adapt to such a confined niche and still become a vital part of their ecosystem has always been fascinating to me.

What has been your best experience with entomology? The best experiences I have are getting friends and family to help collect insects. They always get excited and become determined to catch “the one that got away.” I have also gotten a laugh or two when a praying mantis sneaks up on them when they are not expecting it.

What are your favorite activities outside of your studies? Most of the time, I am out disc golfing or biking. Of course, getting together in person or online with friends and playing videogames is always fun.

What is your favorite insect and why? I have been intrigued with mantidflies for quite some time. They resemble a variety of insects all in one and are classified in the order Neuroptera with lacewings. They are also incredible predators.

What is your favorite thing about MSU? MSU has a lot of different communities you can get involved with. I was able to experience new perspectives and figured out where I wanted to be and spend my time developing a community.

Do you have advice for anyone interested in an entomology major? Get some hands-on experience, whether it be starting your own collection, helping others with collecting, getting a job at a lab or identifying everyday insects. Entomology is very interactive and the practice working with live insects helps.

What are you researching? My research is focused on understanding the impacts of extreme heat on blueberry pollination. Specifically, I seek to understand the impacts of extreme heat on the reproductive functioning and output of blueberry plants and their native bee pollinators. For the bee, pollen is the primary resource of protein and lipids for bees. A nutritious pollen diet during larval development leads to larger, healthier and more resilient bees. So, what happens if that pollen is exposed to extreme heat?

What or who inspired your interest in entomology? I found my passion for entomology as an undergrad working in [Zsafia Szendrei's](#) lab. At the time, I didn't consider entomology as a career path, but wanted to have a paid summer job doing research and was lucky enough to be hired. I worked with [Adam Ingrao](#) looking at biocontrol strategies for asparagus pests and during our long three hour drives to the field, Adam and I would talk insects and ecology. I started to learn how connected the world was by insects, and everything just clicked. I haven't looked back!

What is your favorite insect and why? My favorite insect is the golden northern bumble bee, or *Bombus fervidus*. This bee is native to Michigan and is super fuzzy with a golden abdomen. I see them less frequently than other bumble bee species in Michigan, so it's always exciting to see them in spring.

What is your favorite activity or way to spend your time outside of your studies? When flowers are blooming and bees are flying, I love spending time outside and doing amateur insect photography.

ALUMNI PROFILE JOHN WALLACE

John Wallace is the 2021 recipient of our Department of Entomology's Distinguished Alumnus Award. A professor at Millersville University, he is an expert in medical entomology and stream ecology. In talking with Wallace, he noted "a river has always run through my work." Working in streams, networking with others, he feels a deep flow of connection to MSU and a desire to pass opportunities on to others.

Wallace graduated from Penn State University with a bachelor's degree in environmental education and then joined the United States Peace Corps serving in Guatemala for nearly four years with the beekeeping and wildlife management programs and later training Peace Corps volunteers in the beekeeping program.

"Peace Corps gave me the opportunity to learn about other cultures and apply my knowledge of biological science in several countries," Wallace said. "I knew I wanted to go to graduate school and for international work to be a part of my research program." Through his own research crossing international borders or through encouraging his students to do the same, he has maintained an international thread trickling through it all.

Wallace earned his master's degree in biology at Shippensburg University with Fred Howard, an MSU Entomology alumni who was a student of well-known MSU aquatic entomologist Ken Cummins. This is when Wallace's "river" of connection began to flow. Cummins served on Wallace's advisory committee and recommended him when MSU's Rich Merritt was looking for a doctoral student to work on larval mosquito feeding ecology. Through doctoral studies with Merritt, Wallace gained the skills and knowledge to continue his mosquito work during a post-doc and now at Millersville University in Pennsylvania.

Wallace has a significant teaching appointment at Millersville University but has maintained a strong externally funded research program addressing medically important issues surrounding surveillance and control of mosquitoes and blackflies as well as stream studies focused on stream restoration, and freshwater and estuarine forensic botany and necrobiomes. The key to

his success has been collaborations with colleagues at other universities, some of them his former students, as well as MSU entomologists. Most of his international work has centered around Buruli ulcer, a skin disease caused by a bacterium that creates severe disfiguring ulcers if not diagnosed and treated early. Wallace has continued studying aspects related to the transmission of Buruli ulcer through collaborations first with Merritt and now with MSU's Eric Benbow and University of Melbourne's Tim Stinear that have taken him to West Africa and Australia.

Like Merritt, Wallace is applying his aquatic ecology skills to review forensic evidence in criminal cases, including a case made famous by the Netflix series, the Innocence Files (S1, Ep1, 2). In two separate incidents in the same small town, innocent men were convicted of raping and murdering a child, one man sentenced to death and the other life imprisonment. The Innocence Project asked Wallace to review expert evidence tying bite marks to the suspects. Adapting techniques from his entomological forensic training, Wallace determined the bite marks were consistent with those caused by crayfish and this contribution was part of the final evidence needed to exonerate both men.

Like most professors, the river continues to flow for Wallace as he teaches and trains students. He has recommended several students to MSU Entomology, including Joe Receveur who is now a doctoral student with Eric Benbow and Laura Lazarus who worked with Deb McCullough. His advice to graduate students is to step outside of their comfort zones. "Explore different opportunities and maintain those connections after completing your studies. One never knows from where the next collaboration may come."

As for undergraduates, he advises them to do internships, get involved with research, write grant proposals and present at meetings. This advice has helped whether they go into the job market or pursue graduate studies. He said, "Employers want to see some sort of science passion in an applicant. Students who show a diversity in experiences but more importantly, passion in what they did, are far more successful in interviews."



MEET OUR POSTDOCS **KELSEY GRAHAM**

MSU Entomology's *Bug Talk* podcast recently interviewed postdoctoral researcher Kelsey Graham. She was a postdoc in the Isaacs Lab until December 2020 and is now a research scientist at the USDA-ARS Bee Lab in Utah. In [Episode 41](#), she discusses her job application and interview process during pandemic lockdown, her new job responsibilities and what her expectations are for the future. Graham is active on Twitter [@kelsey_k_graham](#). Congratulations on the new job, Kelsey!



The Bug Talk podcast recently surpassed 4,000 downloads in February 2021 as it neared its one-year anniversary. Outstanding job by the production team and their guests! Listen to episodes here: bugtalk.buzzsprout.com

ALUMNI NEWS

Jareè Johnson (PhD 2008, Merritt) climbed to new heights while on leave from the military. She reported summiting Mt. Kenya, reaching the top in four days and hiking back down in one day. Mt. Kenya is the second highest mountain in Africa.

Courtney Larson (PhD 2020, Benbow) is a postdoctoral researcher with the University of Minnesota - Duluth and US EPA Great Lakes Toxicology and Ecology Division - Watersheds and Water Resources Branch.



Jareè Johnson on Mt. Kenya's summit.

We can't wait for field season!

There are fewer pandemic restrictions and preparations are beginning. Below, Isaacs Lab members grad student Ronnie Miller and technician Henry Pointon build nest boxes for *Osmia* bees.



Bugged newsletter

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AWARDS

Assistant professor **Eric Benbow** has been awarded the Pathology/Biology Section's "Achievement in the Forensic Life Sciences Award"



at the American Academy of Forensic Sciences' 73rd Annual Scientific Meeting, held virtually February 15 - 19, 2021. Some of Benbow's noted accomplishments include serving on three National Academy of Sciences committee, an invited speaker for 69 domestic and international engagements, an author of 140 peer reviewed publications, four books and 29 book chapters.

DID YOU KNOW? MSU COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

Our Department of Entomology actively contributes to these great statistics from the College.

340

AGBIORESEARCH SCIENTISTS
CONDUCTING
LEADING RESEARCH FROM
7 MSU COLLEGES

144,225

PEOPLE PARTICIPATED IN
MSU EXTENSION
PROGRAMMING
JANUARY TO AUGUST 2020

4,306

TOTAL FALL 2020
ENROLLMENT WITHIN CANR
UNDERGRADUATE, GRADUATE
& CERTIFICATE PROGRAMS



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VIDEOS CAPTURE WHY ENTOMOLOGY

SMALL ORGANISMS, EPIC POSSIBILITIES

Visit the **MSU Entomology YouTube** channel (bit.ly/MSUentoYouTube) to see our beautiful, short videos about how our teams of entomologists use insects, small organisms, to find solutions to significant problems. Their work is spanning concerns related to the environment, biodiversity, food security, agriculture, pollination, human health and more.

The series includes:

- Jen Pechal (Feeding the World)
- Adam Ingrao (Healing Powers of Honey Bees)
- Marianna Szűcs (Fighting Invasive Species)
- Eric Benbow (Fighting Infectious Diseases)
- Rufus Isaacs (The Wonders of Wild Bees)



Share these to encourage a potential entomologist!