



MICHIGAN STATE UNIVERSITY

Bugged

MSU DEPARTMENT OF ENTOMOLOGY

Image: Dave Cappaert, Bugwood.org

FROM THE CHAIR

When I became chairperson, I committed to giving an annual “state of the department” seminar. This is my third year and rather than describe change from the previous year, I ruminated over what’s happened since I’ve returned to MSU Entomology. Without doubt, the unstated theme is “change and transition.”

On the change side, over the last two years we hired six new faculty members including: Barry Pittendrigh (University of Illinois), Will Wetzel (Cornell University), Henry Chung (University of Wisconsin), Marisol Quintanilla (University of Hawaii), Amanda Lorenz-Reaves (MSU) and soon to arrive Marianna Szűcs (Colorado State University).

Barry brings exceptional international expertise along with molecular biology. Will is a quantitative ecologist already boasting a paper in *Nature*. Henry is our new insect physiologist and not too long ago published a paper in *Science*. Marisol left sunny Hawaii and almost immediately appeared on the cover of *Soybean News* to feature her newly established applied nematology program. Amanda is well-known by Spartans for her passion and expertise in teaching and has taken over Entomology’s

undergraduate program from the able hands of Drs. DiFonzo and Pett. And, Marianna will become MSU’s first hire into a full-fledged biological control position. She is first author on a paper published in the *Proceedings of the National Academy of Science* in November.

On the transition side, Anthony Cognato was promoted to full professor; Eric Benbow and Zsofia Szendrei were promoted to associate professor with tenure; Wayne Jiang was promoted to associate professor fixed-term; and Jen Pechal became an assistant professor fixed-term. On the other end of the spectrum, Larry Olsen, Fred Poston, Jim Miller and Del Delfosse became professor emeritus.

When you roll all of this up and consider students, postdocs and staff, it is gratifying to see our numbers hitting 200-300 people—that’s a lot of entomolo-

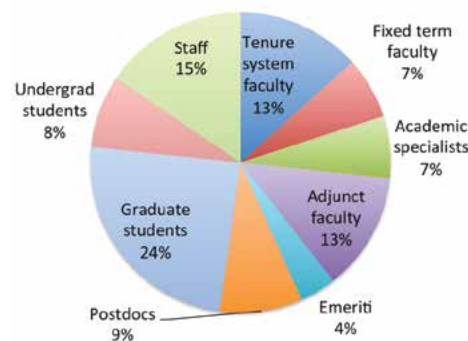
gists! Not only are our numbers healthy, but we’re diverse. Over the last decade we hosted faculty, students, postdocs and staff from 29 counties.

Our entomologists have been recognized with a tremendous number of local, regional, national and international awards. Of special note, Doug Landis is now an MSU Distinguished Professor; we gained three Entomological Society of America Fellows with Drs. Landis, Delfosse and Miller; Jim Smith was elected an Association for the Advancement of Science Fellow; and Karim Maredia received the International Leadership award from the Indian Council of Food and Agriculture.

Last but not least, The Center for World Rankings annually evaluates the world’s leading universities in 227 subject categories including entomology. Based on the number of research articles in top-tier journals, MSU Entomology is #6 in the world!

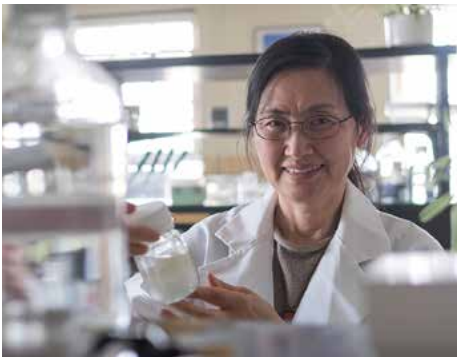
I’m looking forward to the next three years! All the best,

MSU Department of Entomology



Bill Ravlin, Chairperson

RESEARCH & PROJECTS



Ke Dong and team are refining pesticides to kill pests, not bees.

Pyrethroid pesticides are effective. Sometimes too effective. Dong and collaborators have unlocked a key to maintain the insecticide's effectiveness in eliminating pests without killing beneficial insects, such as bees. The study, featured in a recent issue of *Proceedings of the National Academy of Sciences*, shows that molecular tweaks can make the difference.

Pyrethroids target the voltage-gated sodium channel, a protein found in nerve and muscle cells used for rapid electrical signaling. Pyrethroids basically work by binding to the voltage gate of the sodium channel and prevent it from closing. The nervous system becomes over-stimulated and the insect is killed. These pesticides, however, don't have the same effect on humans, or other mammals for that matter.

"For the first time we are showing that unique structural features in bee sodium channels interfere with the binding of tau-fluvalinate to bumble bee sodium channels," Dong said. "This opens the possibility of designing new chemicals that target sodium channels of pests but spare bees." Read the full story at MSU Today: [Refining pesticides to kill pests, not bees.](#)

The MSU Integrated Pest Management Program (IPM) has been awarded \$638,000

from USDA NIFA's Crop Protection and Pest Management Program for extension IPM. Project leader Joy Landis says activities will combine diverse expertise from cover crops and plant pathology to pollination and digital communications, all with the goal of increasing adoption of IPM. Team members include:

- MSU Extension IPM educator Erin Lizotte who specializes in new and emerging crops that help growers diversify.
- MSU Extension sustainable agriculture educator Dean Baas who brings cover crop expertise for better IPM.
- IPM communication specialist Mallory Fournier who partners with Joy Landis in publishing MSU Extension News on IPM and related topics. The two edit and post nearly 700 articles

STUDENT EXPERIENCE SRI LANKA EDUCATION ABROAD

Entomology professor Chris DiFonzo has lead a very popular education abroad program to Sri Lanka for several years on tropical sustainable agriculture. Senior Lidia Komondy received funding from the Department to be part of the May 2017 program and wrote a trip report offering a view into the value of these courses.

A few of my favorite days in Sri Lanka were spent in the muck and mud of the rice paddies, visiting an elephant orphanage, meeting and working directly with rural farm families, sampling and picking tea, attending so many diverse lectures, traveling by three-wheeled cars (tuc tucs), getting to know all the wonderful Sri Lankan students and faculty, and of course finding so many gigantic insects.

More seriously, I learned much more about small scale agricultural practices than I thought I would.

Initially, I had an interest in traveling to find large tropical insects, and learn about different ecosystems, but I was not prepared to learn how difficult farming practices and life in general can be in a developing country where resources are harder to come by. I can definitely say this experience was humbling, and I think it's a great experience for undergrads quickly approaching graduation.



Komondy holding a fish while fellow students work the nets.

It was a great environment to travel in, because I was among other College of Agriculture and Natural Resources students who are studying similar topics and have similar interests. We became great friends through this experience. The faculty at the University of Peradeniya were so hospitable and provided us with such a comprehensive Sri Lankan experience. They placed importance on learning about agriculture and also about their country and culture. These little details made the program so unique.

Dr. DiFonzo was the best coordinator for this program. Not only was she hilarious and kept the environment fun, she made the program much more inviting and adventurous, and I think all the students were grateful for that. Thank you for helping to make this program a reality for me. I'm glad to be in a department with so much encouragement!

- each year written by over 75 MSU campus and field faculty.
- Entomology chairperson Bill Ravlin who serves as MSU's IPM Coordinator.
 - Researchers Zsafia Szendrei and Doug Landis who are leveraging pollinator research grants with extension efforts in this project.

The Albert J. Cook Arthropod Research Collection Database of Lepidoptera specimens has surpassed 50,000 records. Database staff have spent the past year entering label data from North American butterflies and moths into a multi-organizational database as part of the LepNet project funded by the National Science Foundation (NSF). These records include all "microlepidoptera," larger showy species such as silk moths and swallowtail butterflies. There are over 10,000 smartphone and scanned images of adult and larval specimens. Collection director Anthony Cognato credits this productivity to the diligent efforts of Gary Parsons and the collection's data entry team.

Zachary Huang and team are closer to genetic solutions for Varroa mites decimating bees. The team of MSU scientists found genes in Varroa mites that could potentially be exploited to reduce or eliminate the pest. The team's results, published in *Insect Science*, have identified four genes critical for survival and two that directly affect reproduction.

The mite sucks the blood of honey bees and transmits deadly viruses. Its lifecycle consists of two phases: one where they feed on adult bees, called the phoretic phase, and a reproductive phase that takes place within a sealed honeycomb cell, where the mites lay eggs on a developing bee larva. Read the full story at MSU Today: [Varroa mites - bees' arch-enemies - have genetic holes in their armor.](#)

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NEW FACULTY WELCOME MARIANNA SZÜCS

MSU Entomology welcomes a new assistant professor in biological control.

Starting January 2018, Marianna Szűcs will be joining the MSU Department of Entomology as an assistant professor of biological control. She has most recently been a research scientist at Colorado State University in the Department of Bioagricultural Sciences and Pest Management. Her work there has explored the role of hybridization in biological control of weeds.

Originally from Hungary, Szűcs graduated with a university diploma in geography with specialization in geology from the University of Szeged. She earned her PhD in entomology from the University of Idaho in 2010.

Szűcs' research lab will focus on biological control of invasive weed and insect pests. "Biological control is one of the only long-term solutions to problems with invasive species and crop pests," Szűcs said. "It is crucial to understand the processes that lead to success or failure. We will study the role of rapid evolutionary processes and reciprocal interactions



between ecology and evolution in biological control agents and their targets."

Research areas of particular interest for Szűcs include: hybridization effects on fitness, efficacy and host-specificity of biological control agents; the importance of genetic diversity and its interaction with demography in mediating agent and pest establishment and persistence; and the mechanisms enabling biological control agents and pests to adapt to novel environments.

Szűcs' appointment also includes teaching and extension. She looks forward to developing and implementing new biological control programs across Michigan with growers, natural area managers, landowners and the general public.



GUESS-hosted 2017 Fall Picnic
(Many dogs bring their people.)

Courtney Larson, MSU Entomology

The Integrated Crop Pollination Project team led by Rufus Isaacs has released a summary newsletter to highlight some of the findings of this USDA-NIFA funded project. Inside are summaries of their research and extension work including news and photos from team members. The planned five years of the project are complete, but there will be additional publications and activities coming in the next few years. To keep up with the project, visit the website (icpbees.org) or “like” the [project's Facebook page](#).



In September, George Bird attended the Agriculture and Natural Research Congress in Bishkek, Kyrgyzstan, to present a paper titled, *Potato Cyst Nematode and Soil Health Biology*. He also met with a director of the International Science and Technology Center about a potato cyst nematode management grant proposal for Kyrgyzstan and with the Aga Khan Foundation about an international organic farmer training proposal. He concluded his visit by addressing the Kyrgyz National Academy of Science on the science of nematology.

PEOPLE

Entomology is strengthening its teaching and outreach by hiring Amanda Lorenz-Reaves



this fall. Lorenz-Reaves recently completed her PhD with Gabe Ordning and Julie Libarkin investigating people’s attitudes and knowledge of insects to improve how entomology is taught. In her new role as an academic specialist, she will teach undergraduate entomology/integrative studies in general science courses, serve as Entomology’s undergraduate student advisor and implement outreach programs through the Entomology Bug House.

“I want to work with entomology because I see a disconnect in society between the positive things that insects offer us, and the dislike many people feel towards them,” Lorenz-Reaves said. “Insects, with their endless variations in form, are fascinating and beautiful. I really enjoy sharing this side of insects as a means to encourage people to think of them as more than pests.”

ALUMNI NEWS

Duncan Selby is now director of entomology for [Aspire Food Group](#). He writes, “We are the leading company in the drive to create edible protein from insects, namely crickets. We currently employ about 50 people in Austin, Texas, and I now lead a team of four researchers with the goal of maximizing cricket production through research and working with our dozen or so engineers to build automated rearing systems. We also have operations in Ghana. I never thought I would be doing this for a living, but it is very edifying work so far and in many ways is a perfect fit for my skill sets.”

Former MSU Entomology postdoc **Jason Gibbs** has published a treatise on the bees of Michigan, distilling recent and historical bee collection information. This [Zootaxa monograph](#), written while Gibbs worked with Rufus Isaacs on crop pollination, will be a central resource for people studying wild bees in our state,

as it describes 465 species, 38 new state records and one new species. Some taxonomic issues are resolved, and notes are provided on their biology and distribution.

Know someone who should consider entomology graduate studies?

Perhaps you teach undergraduates interested in science or employ interns with a love of nature. Many people are unaware of the field of entomology and the scope of expertise it offers. Help them understand what it means to study entomology at Michigan State University with the insert in this issue of *Bugged*. You can share a link to the insert in PDF format or print copies at: bit.ly/EntoGradStudies

GRADUATE STUDIES IN ENTOMOLOGY

MICHIGAN STATE UNIVERSITY



**SOLVE
BIG PROBLEMS
TAKE
YOUR CAREER
ANYWHERE**



Insects may be small organisms, but studies in entomology really can take you anywhere. At Michigan State University, faculty and students engage in basic and applied research on insects and related invertebrates in these focus areas:

- Food, fuel, fiber
- Natural resources and biodiversity
- Human and veterinary health

These themes are applied across diverse systems including annual and perennial crops, forests and aquatic environments. Research occurs within the state, around the country and in international settings. We work on six continents.

Our students are passionate about gaining expertise and experiencing collaborations that will position them for careers where



they can make a difference. They come to us from smaller colleges as well as large universities around the world. Learn more about the Entomology Department at: www.ent.msu.edu. For a quick overview, don't miss our video: [Entomology: More Than Just Bugs](#).

Interested? Take these first steps to apply

First, find a professor working in an area that interests you and who agrees to accept you into their research program. Here's how:

- Visit the research section of our website, www.ent.msu.edu. Click on the focus areas, for example, natural resources and biodiversity. You will find a description, images of research underway and a list of professors working in that area. Click on a name to read more about their particular expertise.
- After you identify the professors who most closely match your interests, email them to introduce yourself and ask if they are accepting students. We recommend attaching a resume and unofficial transcript. Don't hesitate to contact professors and be persistent in learning if any have openings.
- See the full application process at <http://bit.ly/EntoGrad>.

If you have questions about applying, contact the Department's graduate program director Anthony Cognato (517-432-2369 or cognato@msu.edu) or graduate secretary Heather Lenartson-Kluge (517-355-4665 or lenartso@msu.edu).



**WE CALL IT
SPARTANS
WILL.**

Jobs held by our graduates:

Leaders of conservation organizations * Director of research for edible insect company * Director of Armed Forces Pest Management Board * Advisors in the USDA, military biosecurity and food security * Managers at pest control companies * Extension service educators * Researchers, lab managers and administrators at global companies * Inspectors for invasive species at airports and ports * Human therapies researcher for pharmaceutical company * Arthropod museum curators * Business manager for sustainable technology company * Forensic investigators * Teachers, researchers and administrators at colleges and universities, including former MSU President Gordon Guyer.

COLLABORATIVE POWER

“MSU’s Entomology program positioned me so I could excel at anything I wanted to do. MSU has a multidisciplinary approach to research. You learn to work in teams, which is incredibly important anywhere you might work. Team work is how you accomplish great things.” – Dan Lawson, executive at SC Johnson & Son (now retired).



“Insects are important in our changing society. They have implications toward sustainability, health, globalization, economics and the well-being of our planet. When we study bugs, we are actually studying much, much more.” – Courtney Larson, graduate student, BA Wartburg College, Waverly, IA.

“While working as an undergraduate summer research assistant in an Entomology lab, I did a lot of work in apple orchards with a pest of apples, and I experienced firsthand how our work impacts growers in a positive way. That experience inspired my interest in entomology and graduate school here at MSU.” – Danielle Kirkpatrick, graduate student, BS Michigan State University, BBA Western Michigan University.

“This is a field that links in so well with so many others, you are almost certain to find something you can be very passionate about and is the perfect fit for you.” – Anne Johnson, MSU undergrad, major in entomology.

INDIVIDUAL STRENGTH



“I’ve had the opportunity to work in a genetics lab led by an entomologist, which has given me experience in many modern laboratory techniques that will be useful in my career.” – Brenna Kizer, MSU undergrad, minor in entomology.

“I came to MSU because I wanted a big university that would give me diverse experiences and training. My lead professor taught me so much about the full research process while I was a student and I continue to think, what would he do?” – Mary Gardiner, associate professor of entomology at Ohio State University.



EXTRAORDINARY IMPACT

“Our faculty and resources are incredible. I feel like the education I am getting here is second to none. Entomologists are some of the most well rounded scientists out there because we study organisms that inhabit nearly every system on the planet.” – Adam Ingrao, graduate student, veteran, BS California Polytechnic State University, San Luis Obispo.

“I feel that my education at MSU really prepared me well, not just for a career in entomology, but for the type of college administration I do now. Entomology at MSU is very special because it is an interdisciplinary hub of biologists, economists, engineers and more.” – Jan Nyrop, director of the Cornell University Agricultural Experiment Station.



“I can’t say enough about the Department—the people were fabulous, particularly my professors. I have great memories of field seasons traveling all over Michigan and interacting with growers and the staff at the research stations.” – Kirsten Pelz-Stelinski, associate professor of entomology, University of Florida’s Citrus Research and Education Center.

MICHIGAN STATE
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Department of
Entomology

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MSU Bug House

#SpartanInsects

FEATURED STUDENTS

Name: Ian Paulsen
Hometown: Athens, MI
Future study or career plans: Helping implement bio-pest management techniques in developing nations.



What is your major? Double major in psychology and political science-prelaw.

Why add a minor in entomology to your major? It was something I found interesting enough that I didn't want to continue forward with the rest of my life without obtaining further knowledge on the subject.

Tell us about volunteering at the MSU Bug House: I've worked at the Bug House for nearly four years, and there hasn't been a time where I didn't learn something new and exciting, from the hive mind of a bee colony to seeing baby scorpions only hours old. The excitement of learning something new is a very addictive feeling, and I take that same approach to my classes and this provides me with much more enthusiasm, energy and ability to retain information.

Describe your involvement working with entomological research. I was part of an exciting project in the summer of 2015, right after my freshman year. I worked in Zsofia Szendrei's lab with graduate student Adam Ingrao as a research assistant looking towards bio-pest management for asparagus production. It was really exciting because we were the first people ever, and the only lab in the entire world, that was looking into this particular topic. Essentially, anything and everything we found was an actual new scientific discovery, and that was a great experience to have.

Do you have advice for anyone interested in an entomology minor? Go ahead and do it. It is easily one of the greatest decisions I have ever made in my life, as the opportunities I've obtained since are astounding.

What or who inspired your interest in entomology? Amanda Lorenz-Reaves and Ryan Kimbirauskas. Ryan was my lecture professor and Amanda was my lab instructor for an ISB course I took as a freshman, and all I can say is that the spirit and passion they had for the subject is what initially got me so interested in the subject and it was only good things from there.

Name: Daniel Hulbert
Home state: Michigan
Previous education: BA, Kalamazoo College; MS, Michigan State University
Major professor: Jim Smith



What are you researching? Systematics of the genus *Rhagoletis* (Diptera: Tephritidae).

Why study entomology? Insects are such an important and interesting group of organisms! Studying insects is great for addressing immediate practical issues like crop pests, pollination, disease vectors and forensics. And you can study subjects fundamental to biology such as evolution, genetics, systematics, developmental biology, neurobiology and ecology.

What or who inspired your interest in entomology? I took an entomology course as an undergraduate student with Dr. Ann Fraser, it was so interesting and well-taught.

What is your favorite activity or responsibility as part of your graduate studies? Teaching undergraduate biology lab courses has been a very rewarding experience.

What is your favorite thing about MSU? I love the MSU Graduate Employees Union!

What is your favorite insect? Do I have to say my research organisms? Because that is *Rhagoletis*. Otherwise, I have always been fond of robber flies (Asilidae) because they have cool mustaches!

What is your favorite way to spend your time outside of your studies? I have a dog, and we very much like going for walks and playing in the park.

What's GUESS at MSU Entomology?

The Graduate and Undergraduate Entomology Student Society (GUESS) is a service-oriented organization that revolves around a common interest in entomology. They build community with service and social activities.

Sharing our science, networking and competing at the 2017 Entomological Society of America meeting

The Entomological Society of America (ESA) held its annual meeting Nov. 5-8, 2017, in Denver, Colorado. The meetings are an opportunity to present research along with teaching and extension innovations, reconnect with alumni, meet prospective students and faculty, compete in competitions and honor outstanding entomologists. Here are some highlights from the 2017 meeting.

Our first debate team

Jim Smith coached a team of students willing to make the Department's first effort in debating. Students Lidia Komondy, Joe Receveur, Courtney Larson and Nick Babcock gave a strong argument but lost to Purdue University. Their position will be published in a future issue of the *American Entomologist*. The topic for the debate was: "What is the most urgent and feasible use for CRISPR/Cas9 in Entomology?" and the team's position statement was "The most urgent and feasible use for CRISPR/Cas9 in Entomology is to combat tick-borne illness." The team says MSU Entomology will compete again in 2018.

Student winners

Alumni will remember the pressure and excitement of competing at the ESA meeting. This year's student winners are:

- **First Place: Heather Leach** (PhD, Isaacs); Graduate Ten Minute Paper Competition (Sunday), P-IE: Invasive Species.

- **Second Place: Adam Ingrao** (PhD, Szendrei); Graduate Student Poster Competition (Monday), P-IE: Chemical Ecology and Climate Change.
- **Second Place: Danielle Kirkpatrick** (PhD, Gut); Graduate Ten Minute Paper Competition (Monday), PI-E: Behavior.
- **Second Place: Gabriela Quinlan** (PhD, Isaacs); P-IE: Honey Bees.
- **Second Place: Gina Sari** (MS, Cognato); SysEB: Coleoptera.

Landis honored by IOBC Nearctic Region

Doug Landis was awarded the Distinguished Scientist Award from the International Organization for Biological Control, Nearctic Regional Section (IOBC-NRS). One individual is recognized annually for the award. Nominees must have spent most of their career in the Nearctic, (the United States and Canada) and have made significant contributions to the area of biological control.



Dave Smitley was honored with the Distinguished Achievement Award in Horticultural Entomology by the Entomology Society of America, after receiving the North Central branch award of the same name early in June. Above, he accepts the award from ESA President Susan Weller. This award honors an entomologist who has contributed to the American horticulture industry, and is one of ESA's highest honors for this field. **Congratulations, Dave!**

Courtesy photo of Entomological Society of America



Adam Ingrao, MSU Entomology

Adam Ingrao, MSU Entomology

Above, mixing at MSU-OSU mixer. Below, our debate team and aquatic entomologists lunch.



Courtesy photo of Courtney Larson, MSU Entomology



Courtesy photo of Courtney Larson, MSU Entomology

ALUMNI PROFILES: COL. JAMIE A. BLOW

When did you graduate? I earned a PhD in medical entomology in 1998 with Dr. Ned Walker.

Why did you choose entomology? Why MSU? The Army actually selected me to be a medical entomologist when I was being commissioned out of ROTC. The Army has long-term education opportunities, which includes masters and PhDs in entomology. I chose MSU because I was a Michigan resident and after meeting with Dr. Walker I had confidence I could complete the requirements in three years.

What is your current assignment? I have attained the rank of colonel and serve as the director of the Armed Forces Pest Management Board (AFPMB) and director of Defense Pest Management. I am responsible for pest management policy, guidance and advocacy within the Department of Defense (DOD). I am the first woman to be selected as the director of the AFPMB and one of only three women to attain the rank of colonel in the entomology field, which is over 70 years old. We have good representation by MSU among the Army entomologists: Major Jaree Johnson (MS); Major Elizabeth Wanja (PhD); Major Karl Korpala, retired (BS); Major Scott Mueller (MS); and Major Wade DeYoung (BS).

What is it like to work as an entomologist in an active war zone? The military camps/bases are essentially small towns or cities where service members live, eat and work. It takes a coordinated effort to provide the support needed in these locations including public health personnel to ensure things are done correctly. Entomology/pest control is an aspect of the larger public health field. When I was deployed to Bosnia, I was

responsible for all monitoring aspects of public health, food, sanitation and hygiene for U.S. forces. In Iraq, I was the senior entomologist in theater and worked on the Medical Brigade staff that provided guidance to our subordinate medical units. I was also designated as the theater pest management consultant and wrote the first integrated pest management plan for the U.S. military operating in Iraq.

I also provide expert input on issues related to entomology. In Iraq, I was involved in the Iraq Ministry of Agriculture lead effort for aerial spraying of date palms for the Dubas bug. In Bosnia, I was involved in determining why honey bees were dying.

You were part of establishing the MSU Bug House. Tell me about that. Then-chairperson Dr. Mark Scriber and Dr. Dave Smitley were talking with students about an extension outreach program focused on K-6 students to interest them in entomology. Dr. Scriber identified two conference rooms to create the space, the Department rented a display from a farmer near Kalamazoo and we gave it a trial run with Lansing-area schools. It was like baseball: build it and they will come. The trial run was a success. Soon we had schools coming from long distances and we were turning schools away as we were booked.

The students who worked as guides in the Bug House built display cases for different topics that were more geared toward what the students were learning. In just three short years, the Bug House was going strong and it continued to grow, later including Bug Camp. I credit the Bug House success to the support of the Department, the entomology students, but most importantly



to Barb Stinnett who worked tirelessly for the Bug House.

Any advice for current students? If you are waiting for someone to hand you the perfect opportunity, you will probably find yourself waiting a long time. Opportunities are out there and while they may not be exactly what you want, if you are willing to give it a try, you may find it is something good. Sometimes it's doing things like creating the Bug House—you just start and keep adjusting as you go.

How does your work impact people's lives? My job is to support and protect the War fighter and the DOD from "pests." A pest can be invasive species, weeds, feral animals, vector of disease, urban pests, etc. I can be discussing brown tree snakes in Guam one minute and talking about the next vector-borne disease threat in the next minute. How do we protect people and facilities? How do we avoid pesticide overuse? How do we deal with pesticide resistance?

Along with deployments to Honduras, Central America, Bosnia, Afghanistan and Iraq, I've worked or lived in places like Kenya, Thailand, Germany and Tanzania. I've been to London, Paris, Athens, Warsaw, Berlin, Bangkok, Prague, Rome, Barcelona, Tbilisi, Zanzibar and many others. If given the opportunity to go back and change things, I wouldn't. I'd do it all over again.



Michigan State University
Natural Science Building
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FALL

TRANSITIONS

Welcome to these new graduate students:

Ignatius Andika (started Spring 2017), MS student with John Wise.

Celeste Wheeler, MS student with John Wise.

Emilie Cole, MS student with Marisol Quintanilla-Tornel.

Sarah Galley, MS student with Zsofia Szendrei.

Rex Mbewe, PhD student with Ned Walker.

Holly Hooper, MS student with Matt Grieshop.

Michael Piombino, MS student with Dave Smitley.

Erica Fischer, MS student with Anthony Cognato.

Zinan Wang, PhD student with Henry Chung.

Olivia Morris, MS student with Deb McCullough.

Louise Labbate, MS student with Deb McCullough.

Congratulations to the following on receiving doctoral degrees this fall:

Knute Gundersen will pursue a career in industry.

Tony VanWoerkom will continue to work at MSU on pesticide-related research.

Rebeca Gutierrez plans to apply her passion for entomology and her experience in pest management research in the private sector.

