

Entomology

Newsletter 2013-2014



Department of Entomology
University of Illinois at Urbana-Champaign
(Illini *Chauliognathus lububris* courtesy Alex Wild)

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Message from the Head



“Groundhog Day,” a movie written and directed by Illinois resident Harold Ramis, celebrated its 20th anniversary in 2013. In this movie, “Phil Connors, an arrogant and egocentric Pittsburgh TV weatherman who, during a hated assignment covering the annual Groundhog Day event in Punxsutawney, finds himself...repeating the same day again and again.” (http://en.wikipedia.org/wiki/Groundhog_Day_28film_29, accessed Dec. 2014) The year 2013 was also my 21st year as department head, and I felt a lot like Phil Connors, as yet again central administrators urged merger plans; this time, our Provost Ilesanmi Adesida convened a committee to evaluate the feasibility of merging ALL of the biology-related programs on the campus (across four colleges) into one amorphous mega-department. His goal apparently was to increase our national ranking—but, in terms of entomology, how can we increase our ranking when once again we’re ranked number 1? Academic Analytics again placed us Number 1 among all entomology departments in 2013 (although only No. 2 in entomology as a discipline, mostly due to the metrics that are not per capita; we lose a little compared with programs five times larger than we are)...

In other administration news, in 2014 SIB gained a new Director, Carla Caceres; Andy Suarez, hitherto a 50% appointment in Entomology, dropped down to 25% in order to become the new Head of Animal Biology; Barbara Wilson was named the new Dean of LAS; and in upcoming administrative news, in 2015 Bob Easter, Animal Science Professor who came out of retirement to serve as first Chancellor and then President of UIUC, will retire for the third time and Tim Killeen will be our new President as of July 2015.

Speaking of “new”, our two newest faculty members, Alex Harmon-Threatt and Allison Hansen, are now in place and productively pursuing pollinators and pea aphids, respectively. Also on the plus side, we gained Tandy Warnow from Computer Science, and Matt Yoder, Joe Spencer, Ed DeWalt and Sam Heads from the Illinois Natural History Survey as affiliates. To retirement we lost retiring NRES affiliate David Onstad, who now works for DuPont in Delaware, and, from the Illinois Natural History Survey, retiring medical entomologist (and UIUC alumnus) Richard Lampman, along with fellow medical entomologist Nina Krasavin and INHS aquatic oligochaetologist Mark Wetzel. INHS systematist Felipe Soto left the Survey effective December 2014 but he’s remaining a department affiliate at least for the short term. In terms of our emeritus faculty, after a spectacularly successful post-retirement career in town as a book author, Gil Waldbauer moved to Florida to be close to his daughter and her family. Sadly, on April 11, 2014, the world lost Jim Sternburg, triple UIUC entomology alumnus and long-time beloved faculty member and all-around wonderful human being.

On the student front, graduate student achievements this year include national and international recognition. Joining the program in Fall 2014 were Fulbright Fellow Rafael Achury, Beca Colciencias Fulbright Nathalie Baena, and NSF IGERT trainee Erin Allman. Other fine Fellows were Fred Larabee, who received a Smithsonian Predoctoral Fellowship, Tolu Agunbiade, with an HHMI International Student Fellowship, and Michelle Duennes and Nick Naeger with ARCS (Achievement Rewards for College Scientists) Fellowships. I’d like to point out that, in the 2011 Doctoral Program campus review conducted by Dean Dutta, the one criticism our program received was that we ought to have more external fellowships. Enough said! As for undergraduates, our Individual Plan of Study students Tanya Josek, Tyler Hedlund, Mallory Hinz, Jon Massey, and Jacob Herman all graduated, Jon Massey with distinction, and Jake not only with a major in IPS Entomology but also a major in Honors Biology (he graduated having completed more than 50 credit hours of advanced level coursework). Tanya and Tyler both remained at UIUC to get their Master’s degrees in entomology. Joining the IPS program since 2013 were Chris Petranek, Thorsten Hansen, and Victoria Wong. Thor, working with Allison Hansen, received the SIB Robert H. Davis Undergraduate Research Prize (I don’t know if any publications are in the offing, but “Hansen and Hansen” authorship might create some confusion). Uni High students continue to populate our labs during the summer months, thanks in large part to alumnus David Stone, MS 1987. One high school junior, Vikram Bagchi, presented some of the work he conducted in my laboratory at the 2014 International Society of Chemical Ecology meeting and afterwards received an offer from a scientist in the audience to join his laboratory as a graduate student!

Rivaling upper level administration for turnover in 2013-2014 was our office staff; after Audra Weinstein’s departure in March 2013, Adrienne Harris served as head secretary for almost a year and after she left Kim Leigh, who had been a half-time secretary in our office (as well as half-time secretary for the Program in Ecology, Evolution and Conservation Biology), much to our collective delight, became our head secretary, where we’re happy she has been since.

In terms of teaching, the Department offered its usual assortment; a new offering in Spring 2014 was Allison Hansen’s bioinformatics and human genomics course. Entomology faculty have signed up to help deliver a new series of graduate seminars rotating among ecology, evolution and genomics (Hugh kicked off the series in Fall 2014 with genomics). IB483, Insect Pathology, however, is going 21st century and becoming an online course in 2015. By the way, Carol Augspurger, SIB Associate Director, is anxious to drop small-enrollment courses and as a consequence after 31

years Chemical Ecology will no longer be taught (although, fearful of going cold turkey, I did offer an advanced topic seminar in the subject Fall 2014).

Outreach efforts continue. Our 30th festival, featuring insect-themed X-Files films and television episodes, was the largest in, well, 30 years—about 2000 people came from at least six states to see not just the films (which are, after all, available on video and/or Netflix) but also Chris Carter, the creator/writer/producer/director of the films and series, in person, along with Darin Morgan, the scriptwriter of the classic “War of the Coprophages” episode (featuring USDA entomologist Dr. Bambi Berenbaum, a personal favorite of mine). Attendance was back to a more normal level for the 31st Insect Fear Film Festival, our first pesticide fear film festival (and, at 31, the IFFF is still the longest-running insect film event and oldest college celebration of insects in the United States). The Pollinarium is also thriving, averaging more than 2500 visitors every year, and National Pollinator week is generating a lot of enthusiasm in the community. Our online citizen-science monitoring project Beespotter went semi-international by joining forces with Bumble Bee Watch, a citizen-science bumble bee monitoring site coordinated by the University of Ottawa, Wildlife Preservation Canada, and the Montreal Insectarium (but we’re resisting the urge to change the name to “Beespotter-eh”...).

On the alumni front, Rick Brenner (MS 1976) was our alumni speaker in Fall 2013, and Tom Miller (postdoc 1967-8) was our alumni speaker in 2014. Fred Schmitt, who was a student of Gottfried Fraenkel from 1958 to 1962 or thereabouts, generously remembered us in his will, providing \$100,000 for summer scholarships for out-of-state students. In addition, we’ll be using LAS Development funds to offer four additional summer scholarships. For years I’ve reassured students that no one should have to pump gas to stay in graduate school. Given the near-ubiquity of self-service stations, that metaphor is showing its age, although full service stations still can be found in New Jersey. So I guess I’ll amend my reassurance to “no one should have to move to New Jersey to pump gas to stay in graduate school...”

Several building anniversaries have been marked by renovation plans. The Natural History Building (that is, the “new part” of the building dating to 1908) was declared structurally unsound just two years past its 100th birthday (or the 115th birthday for the “old part” of the building). Thousands of displaced IB students have been accommodated in swing space, including in teaching labs in Roger Adams (which itself underwent an extensive renovation in 2009, on its 60th birthday). Speaking of birthdays, Morrill Hall, which was known as “the Entomology building” during its construction due to the fact that half of its \$2 million construction cost came from the National Institutes of Health and National Science Foundation for the study of insect disease vectors, had its 50th birthday without public acknowledgment (unless the cockroaches had a party I didn’t hear about). The birthday did, however, fortuitously coincide with a special initiative from the Provost’s office, and the oldest parts of Morrill will undergo a million dollars’ worth of renovations, scheduled to be completed by sometime in 2017.

Morrill Hall and the rest of campus did have a few more visitors than usual in summer 2014 thanks to our little department, which hosted two international meetings, the International Society for Chemical Ecology annual meeting first week of July and the Arthropod Genomics Annual Meeting in June. For both meetings, visitors were treated to an entomological tour of the campus, with stops marking campus discoveries relating to carnitine, bursicon, insect mariner elements, synthetic antimalarials, degradophors, sociogenomics, and the longest continuous soil fertility experiment in the Western Hemisphere. Away from home, UIUC entomologists were also organizers; for the Entomological Society of America 2013 meeting alone, UIUC faculty Brian Allan and Allison Hansen, graduate students Brendan Morris, Christina Silliman and Katie Dana, former graduate student Reed Johnson, former postdocs Hongmei Li and Christina Grozinger, former students Ashley Bennett, Tugrul Giray, Heather Hines, Joel Coats, and former PEEC student Silvia Rondon all organized symposia.

One more 2014 event of note--my fourth fifth-year review, originally scheduled for 2012 but postponed to accommodate the five-year review of School of Integrative Biology Director Evan DeLucia, took place in 2014, 20% of the way into my fifth fifth-year review. On March 10, I received the report from the Dean on my outcome of the review. According to the Dean, “The ad hoc review committee, chaired by Professor Donald Wuebbles and including Professors Stewart Berlocher, Bettina Francis, Larry Hanks and graduate student Michelle Duennes provided a comprehensive report to us....The review indicates Professor Berenbaum continues to have the strong support of the department’s faculty. Her leadership of the department and her many contributions were recognized by nearly all faculty. Based on this very positive report, I have asked Professor Berenbaum to continue to serve as Head and she has agreed to do so.” That was good news but two things bothered me about the email message; first, the Dean said that my contributions were recognized by “nearly” all faculty (truth be told, I was hoping for “all”), and, second, the letter was addressed to “May Berenbarum”. Whoever Dr. Berenbarum is, Dr. Bambi Berenbaum and I would love to meet her some day and congratulate her on a job (mostly) well done! Stay in touch, everyone!

FACULTY AWARDS AND RECOGNITION



On November 20, 2014, May Berenbaum was one of 10 people to receive the 2012 (yes, the 2012—not a typo) National Medal of Science from President Barack Obama in the East Room of the White House. The official citation reads “to May Berenbaum, University of Illinois at Urbana-Champaign, for pioneering studies on chemical coevolution and the genetic basis of insect-plant interactions, and for enthusiastic commitment to public engagement that inspires others about the wonders of science.”

May is one of 7 entomologists to receive this honor since the program was established in 1959. The others were:

1966 Edward F. Knipling, Entomology Research Division, USDA ARS, Beltsville, MD

1976 Edward O. Wilson, Dept. Organismic and Evolutionary Biology, Harvard University

1983 Wendell L. Roelofs, New York Agricultural Experiment Station, Geneva NY/Cornell University

1985 Berta Scharrer, Dept. Anatomy, Albert Einstein College of Medicine at Yeshiva University

1994 Thomas Eisner, Dept. Neurobiology and Behavior, Cornell University

2014 Jerrold Meinwald, Dept. Chemistry and Chemical Biology, Cornell University (awarded 2012).

Depending on how administrative reporting lines are interpreted, May might well be the first entomologist to receive the National Medal of Science whose principal academic appointment is actually in a university Department of Entomology.

The National Medal of Science was actually the second medal that May received that week; on November 16, in Portland, Oregon, Tom Green, President of the Entomological Foundation, presented her with the Foundation’s Medal of Honor, in recognition of “distinguished service in the field of entomology.” At the request of Dr. Green, the Plenary Session audience stood and did The Wave in her honor...Previous winners were Nan-Yo Su (2012, Department of Entomology and Nematology, Ft. Lauderdale Research and Education Center, University of Florida-Ft. Lauderdale) and John Acorn (2013, Dept. Renewable Resources, University of Alberta-Edmonton).



Gene Robinson receives Animal Behavior Society award



Photo by L. Brian Stauffer

Gene Robinson, the Swanlund Chair of entomology and neuroscience and the director of the Institute for Genomic Biology at the University of Illinois, is the recipient of the Animal Behavior Society's 2013 Distinguished Animal Behaviorist award.

◀ Click photo to enlarge

STORY

8+1 Rec'd this n. 8 Like 25 EMAIL SHARE

8/2/2013 | Chelsey B. Coombs, News Bureau Intern | 217-333-5802; diya@illinois.edu

CHAMPAIGN, Ill. — **Gene Robinson**, the Swanlund Chair of **entomology** and **neuroscience** and the director of the **Institute for Genomic Biology** at the University of Illinois, is the recipient of the **Animal Behavior Society's** 2013 Distinguished Animal Behaviorist award.

Robinson is best known for his studies of the mechanisms and evolution of social behavior in the Western honey bee. He has developed a paradigm that integrates behavioral studies, endocrinology, neuroscience, genomics and evolution to explore various types of social behavior, including aggression, communication and socially regulated behavioral maturation.

"More generally, my laboratory is interested in understanding the complex relationships between genes and social behavior — that is, how do genes influence neural function to affect behavior, and in turn, how does the social environment 'get under the skin' to affect the genome, the brain and the resulting behavior," Robinson said. "Genomics provides powerful resources for this endeavor, and we are careful to stay abreast of the latest developments so we can employ the best technologies to address these key questions."

During his career, Robinson has written or co-written more than 250 published articles, and he led the effort to sequence the genome of the honey bee.



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iCON Innovator Award (University Level)

OVERVIEW
PAST AWARD WINNERS
NOMINATE

The **iCON Innovator Award** recognizes an active researcher/scientist within the ranks of life sciences education who is acknowledged by his or her peers as a leader in the contemporary teaching of, and scholarship in, biotechnology and its related sciences. The award also recognizes those scientists who demonstrate leadership potential at the frontier of knowledge in the life sciences and conduct research that is anticipated to enhance economic development in the State of Illinois.

Past iCON Innovator Award Winners

2013	Dr. Gene E. Robinson	◀
2012	Janet Davison Rowley, MD	◀
2011	John A. Rogers	◀
2010	Brenda Russell Ph.D.	◀
2009	Thomas J. Meade	◀
2008	Daphne Preuss	◀
2007	Chad A. Mirkin	◀

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LATEST NEWS »

Renowned scientist Gene E. Robinson to deliver CAS Lecture

Photo by L. Brian Stauffer

Entomologist Gene E. Robinson, the director of the Institute for Genomic Biology, will deliver the 23rd Center for Advanced Study Annual Lecture on Feb. 19.

◀ Click photo to enlarge

STORY 8+1 Rec'd this n. 8 Like 8 EMAIL SHARE

1/31/2014 | Dusty Rhodes, Arts and Humanities Editor | 217-333-0568; rhodes8@illinois.edu

CHAMPAIGN, Ill. — **Gene E. Robinson**, the Swanlund Chair of **entomology** and the director of the **Institute for Genomic Biology** at the University of Illinois, has been selected to deliver the **Center for Advanced Study's** 23rd Annual Lecture, continuing the center's tradition of showcasing the university's most distinguished scholars. Robinson's lecture, which begins at 7:30 p.m. on Feb. 19 at Spurlock Museum on campus, is free and open to the public.

Robinson pioneered the study of how genes, hormones and neurochemicals influence the evolution of social behavior, using the Western honey bee as his principal model system. He leads the Honey Bee Genome Sequencing Consortium and the Illinois Bee Research Facility.

In his lecture, titled "Me to We: Searching for the Genetic Roots of Sociality," Robinson will use the honey bee and related species to demonstrate how researchers who have used genomics to study the social life of insects in molecular terms have documented mechanisms that regulate selfish behavior. They also have documented connections between socially responsive genomes and human health.



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ACAA Recipients

2014 Recipients

- Courtney Keith
- Leonard Schein
- Dr. Barry Pittendrigh
- Sel Murray
- Sean McEachern

2013 Recipients

2012 Recipients

2011 Recipients

Dr. Barry Pittendrigh BSc (Hons)'90 (Luther) - Award for Distinguished Professional Achievement

Dr. Barry Pittendrigh's commitment to ensuring the results of his research got into the hands of the people who needed it — farmers in sub-Saharan West Africa — means people all over the world now learn from animations on their cellphones.

Pittendrigh BSc '90, an entomology professor and researcher at the University of Illinois Urbana-Champaign, heads a large research program aimed at finding solutions to pest problems in cowpea, a legume crop that is an important source of protein for some of the poorest people in West Africa.

The research has resulted in the development of methods of controlling pests in cowpeas biologically, but efforts at providing this information to farmers were confounded by the fact that many of the farmers were low-literate learners and they spoke many different languages.

That problem led Pittendrigh and his colleagues to create Scientific Animations Without Borders (SAWBO), a University of Illinois-based program that produces animated 2D and 3D educational videos that people can watch on their cellphones. The content can be scientific knowledge or traditional indigenous knowledge, and the language of the narration can be changed to match the language of the intended users.

The cellphone is an emerging educational tool because ownership of cellphones, many with Bluetooth and video capacity, is widespread in both rural and urban areas of Africa and other parts of the developing world. SAWBO's partner group in Niger, for example, has transferred the videos to an estimated 50,000 cowpea farmers.

Since its inception, SAWBO's reach has expanded far beyond its original target audience. Developing animations that can be loaded on to cellphones has been embraced as a way to provide information of all kinds to low-literate populations all over the world, addressing subjects such as pest control, better cropping methods, disease prevention and treatment, safe water and microfinance.

Pittendrigh is the 2014 recipient of the Alumni Award for Distinguished Professional Achievement, awarded to an alumnus who has achieved professional excellence and distinction in his career, and has demonstrated leadership in his pursuit of success.



A major highlight of **Sam Heads'** year was the publication of *Electrotettix attenboroughi*, a new genus and species of fossil pygmy grasshopper (Orthoptera: Tetrigidae) from the Early Miocene Dominican amber. This discovery was widely covered in the international media and was accompanied by a mini-documentary produced by the UIUC News Bureau featuring none other than Sir David Attenborough himself. The video can be found here: <http://youtu.be/kN8pGc3-odY>



YouTube

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WINDOWS ON A LOST WORLD

RESEARCHERS SCOUR DOMINICAN AMBER FOR CLUES TO THE ANCIENT PAST

NARRATED BY DAVID ATTENBOROUGH

ILLINOIS

0:10 / 6:29

Windows On a Lost World: Researchers Scour Dominican Amber for Clues to the Ancient Past

Illinois1867

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Published on Jul 25, 2014

Nature and science documentarian David Attenborough describes the effort to screen a newly rediscovered collection of amber from the Dominican Republic and the tiny grasshopper found in 20-million-year-old amber that was named for him. Researchers at the Illinois Natural History Survey at the University of Illinois are scouring more than 160 pounds (72 kg) of the Dominican amber for ancient fossils. When their work is completed, they will have the largest unbiased amber fossil collection in the world. The most valuable specimens will be digitized and made freely available on a website. The amber was collected by INHS entomologist Milton Sanderson in the late 1950s. Sanderson died in 2012.

For more information about the pygmy locust discovery: <http://www.pensoft.net/journals/zooke...>

For more information about the researchers' work on the amber collection: <http://news.illinois.edu/news/14/0730...>

Student news

List of Outstanding Teachers at UIUC (faculty underlined)

Spring 2013

Brian Allan*, May Berenbaum (109, 199), Juraj Cech, Michelle Duennes*, Jo-anne Holley*, Fred Larabee, Gwyn Puckett*, Johnny Yu

Fall 2013

Catherine Dana, Andrew Debevec, Mark Demkovich, Lawrence Hanks (401, 482)*, Jo-anne Holley, Jungkoo Kang, Sindhu Krishnankutty, Tara McGill, Linnea Meier, James Whitfield, Joseph Wong, Johnny Yu

Spring 2014

Brian Allan (361, 526)*, Jo-anne Holley*, Fred Larabee, Tara McGill, Andrew Suarez, James Whitfield

Fall 2014

Sarah Hughson, Andrea Walker, Jungkoo Kang, Mark Demkovich, Bettina Francis, May Berenbaum, Nicholas Naeger, Marsha Wheeler, Andrew Suarez, Frederick Larabee, Lawrence Hanks, Tania Jogesh

Campus awards

Undergraduate Entomology Research Award – Yali Zhang (2013)

Ellis MacLeod/DuPont Award for Outstanding Teaching – Fred Larabee (2013), Michelle Duennes (2014)

John G. & Evelyn Hartman Heiligenstein outstanding Teaching Assistant – Nicholas Naeger (2011)

2013-2014 Dissertation Completion Fellowship– Jo-anne Holley

2014-2015 Dissertation Completion Fellowship – Nick Naeger, Fred Larabee

2014-2017 Illinois Distinguished Fellowships – Josh Gibson

2014 NSF IGERT fellows--Erin Allman, Patrick Gero, Luck Zehr, Scott Cinel

2014 Herbert Holdsworth Ross Memorial Award--Natalie Baena, Michelle Duennes, Terry Harrison and Aron Katz;

2013 recipients--Therese Catanach, Jo-anne Holley, Katherine Murphy, Kyle Parks, Rhiannon Peery

2013 William Luckmann award--Sarah Hughson in 2013

2014 William Luckmann award and the Phillip W. Smith Memorial Fund award--Allison Gardner

Francis M. & Harlie M. Clark Summer Fellowship--Allison Gardner

Francis M. & Harlie M. Clark Research Support Grants--Sarah Giers, Tyler Hedlund, John Maddux, Kyle Parks

Graduate Students in Ecology and Evolutionary Biology Symposium Award-- Allison Gardner

Off-campus awards

EPA STAR fellowship—Allison Gardner

2014 Fulbright Fellow—Rafael Morales-Achury; Colciencias Fellowship--Nathalie Baena

CLACS Tinker Fellowship—Aron Katz

Sigma Xi grant in aid of research--Allison Gardner, John Maddux

Entomological Society of America President's Prize for Student Oral Presentations Competition: Fred Larabee 2013 and Selena Ruzi 2014

2014 Entomological Society of America President's Prize for Student Poster Presentation Competition: Daniel Bush

2013 Science Project Ideas Competition, Entomological Foundation AND 2013 mini-grant, Environmental Education Association of Illinois to Christina Silliman and Catherine Dana, and the Program Enhancement Fund from the Entomological Society of America went to Christina Silliman, Brendan Morris, and Catherine Dana.

2013-14 Achievement Rewards for College Scientists (ARCS) Foundation Scholarships went to Michelle Duennes and Nicholas Naeger

2013 International Union for the Study of Social Insects travel grant—Nick Naeger.

2013 Society for Conservation Biology travel grant—Mami Randrianandrasana

Pollinatarium news

The UI Pollinatarium, the discovery/science center dedicated to raising pollinator awareness, is the ultimate in repurposing; the building at the south end of the UI Arboretum was originally constructed as a pesticide storage shed, spent over a decade as Gene Robinson's Bee Research Facility, and in 2009 was converted into a facility for science outreach (thereby pretty much covering the tripartite mission of the land grant university at one address). Aply managed by UIUC alumna Lesley Deem, in both 2013 and 2014 the Polli hosted over 2500 visitors. Among them were students ranging from preschoolers to undergraduates to Osher Lifelong Learners, community groups, beekeepers, agritourists and drop-in campus visitors. We're now part of the Museum at the Crossroads consortium spanning Champaign County and we've hosted a weekly summer lecture series along with meetings, including the 2013 Central Eastern Illinois Beekeepers Association and the Illinois State Beekeepers Association. Adjacent to the Polli is a reconstructed prairie where visitors can get "up close and personal" with pollinators in their natural habitat, along with various and sundry pollinator-friendly plantings, including, in 2013, a "salsa garden" planted and maintained by local children. It's also the official UIUC home of National Pollinator Week in June as well as National Moth Week in July. Here's a summary of activities in 2014, just to provide an idea of what goes on...

Pollinatarium visitor summary 2014

School Groups

Preschool/Daycare

[30] Orchard Downs Preschool – Bumble bees; [26] Shining Star Preschool; [38] Rantoul preschool

Elementary

All Champaign Unit 4 Second grade classes (41, up from 36 last year) [approx. total 836 students, 41 teachers and numerous parents and aides] [~1000]-- *Barkstall 4 classes, Kenwood 4, Southside 3, Stratton 3.5, Bottenfield 4, Carrie Busey 3.5, Dr. Howard 3, Garden Hills 4, Washington 4, Westview 3, Robeson 4*

International Prep Academy (New this year). We added a bilingual worksheet for the Spanish speaking students.

Monticello 3rd grade 2 groups; Prince of Peace Community Early Learning, St. Joseph (Kind. & 1st)[~15] life stages of honey bee, (2nd & 3rd)[17], (4th & 5th)[15]; Next Generation, Champaign (2nd & 3rd)[30 students & 3 teachers] – life cycles; Unity West Elementary (1st grade) 2 classes [~46]; [25] University Primary School (2nd & 3rd, 4th)

Middle School (5-8)

Jefferson Middle school, Yulia Bezriadina (6th); Next Generation – Kathy Feser, topic: Habitats; University Primary School (5th); Zane Newman (wings and flight)

High School

Oriole Park Science Olympiad; Urbana High School [18] FFA- honey bees, bumble bees, planting prairie; 4-H Summer camp Crop Sciences (8-12th grade)[14]; ACES: RAP (Research Apprentice Program) Biotechnology program, Dept. Crops Sciences [24]

Home School groups

Melissa Jones – 9: Microscope lesson; Allie Rhine – 18 (15 students, 3 adults) 7, 8, 9th (12-15 year olds) Why insects are important, How to ID insects in the wild and insect collecting; Ali Bell – [15] 8-12 years old – "All about animals" healthy living, social responsibility; Shannon Morber [26]: Life cycles, habitats, colony collapse disorder

College

[10] Entomology graduate student recruiting weekend—prospective students; [17, 14] Parkland Community College, Plant Biology Class Bio109, Mike Retzer; [15] Parkland Community College, Class, Introduction to Horticulture, Theresa Meers; [22] Parkland Community College, Env. Bio. Class, Ralph Bonati; [12,22,15] Parkland Community College, Env. Bio. Class, Heidi Leuszler; [14, 15] University of Illinois, Introduction to Entomology, IB 401; University of Illinois, CPSC 270 Applied Entomology (extra credit)

Adult continuing education New Illinois Farmers class (Aug 9)

Community and Campus Groups visiting the Pollinatarium

CEIBA (Central Eastern Illinois Beekeeping Association); March 20, July 17; [10, 8] Newcomers Group of the Illinois Club – spring and fall visit; [17] Girls Do Science, from Orpheum, April 7; [7] Unity Baptist Primetimers [5] Cub Scout (Dr. Berlocher)– Urbana, IL; [15 campers, 4 adults] Orpheum Girls Do Science camp (Dr. Caceres)

National Pollinator week 2014 Kid's activities at the Pollinatarium: June 22-Sunday; Bee ID and bee box workshop at the Pollinatarium: June 22-Sunday; [8] 4H David Gerstenacker; [6] Champaign County Audubon Society– morning field trip (Sept 13). Critters in litter.

Museum Consortium Group meetings [22] Hosted 2 times) April 10, Oct 9

Illinois State Beekeepers Board meeting (ISBA) Sept 20 [14]

IDNR –ran workshop: Native Plants and Pollinators (Sept 27) [12]

Twin City Garden Club

Visitors from the U.S. (18 states)

Arizona Sierra Vista, **California**, Fremont, Grass Valley, **Connecticut** New Haven **Colorado**, **Florida** Miami, **Illinois** Batavia, Beardstown, Bloomington, Champaign, Charleston, Chicago, Chadwick, Cisco, Davis Junction, Deer Grove, Decatur, Downers Grove, Dundas, Fairbury, Fairmount, Fisher, Glenview, Gibson City, Granville, Hamilton, Homer, Kansas, Ledford, Lexington, *Lincoln, Lombard*, Mahomet, Martinton, Mattoon, Monticello, Mt. Prospect, Naperville, Oak Forest, Paxton, Peoria, Peru, Pesotum, Pinckneyville, Plainfield, Pontiac, Raymond, Rantoul, Rochester, Savoy, Schaumburg, Shawneetown, Sparland, Springfield, St. Jacob, St. Joseph, Teutopolis, Tolono, Troy, Tuscola, Urbana, Victoria, Villa Grove, Waukegan, Weldon, Wheaton, Winfield **Indiana** Ft. Wayne, Hometown, **Iowa** Mt. Union, Palo, Underwood, **Maine** Falmouth, **Massachusetts** Dedham **Michigan** Albion, Farmington **Minnesota** Minneapolis **Missouri** St. Louis **New Jersey** East Brunswick **Ohio** Columbus, New London **Texas** Houston **Utah** Murray **Virginia**

Visitors from outside the US: Brazil, Germany Eberswalde, Japan

Outreach Outside the Pollinarium to Schools and Public Meetings

Museum of the Grand Prairie – 2 hr presentation- Planning and Planting to protect and feed native bees, butterflies and other insects [to help with farm and garden harvests, maintain healthy plant communities, and provide food for other wildlife]; Science Fair Judge- Next Generation School (February 21); Kankakee Beekeepers Workshop (March 8)– 2 presentations (Bee diseases, Adding value to and with honey. Planting nectar plants for enhancing honey flavor, color and quantity. Making salves, lip balms, soap, and candles; [~40] Fox Valley Beekeepers meeting – Presentation about the Pollinarium; [~48] Will County Beekeeping meeting – provided microscopes; Future Farmers of America Convention – Springfield , IL (June 10)-Judging AgriScience fair; Peoria Pollinator Days – (Michelle Duennes); National Pollinator week –Urbana Free Library Pollinators with Paws storytelling and planting seeds for pollinators; Douglas Branch Library – Pollinators with paws and honey tasting (Katie Dana); Travelling Quilting Bee: Museum of the Grand Prairie, Staerkel Planetarium, at Parkland, Anita Purves Nature Center, Spurlock Museum (crafternoon); Secret Life of Bees – demo hive to Museum of the Grand Prairie, July 7 Heartland Apiculture Society meetings – 2 presentations. 1) Bee Gardens and 2) Native Bees; Talk for Master Gardeners at Idea Garden- Garden practices and plantings to help pollinators; Urbana Sweetcorn Festival – beaded bees craft (Aug 23); [53] Wild Ones presentation, Bloomington, IL (Sept 8) – Native plants and bees, Honey bees in agricultural education meeting – Garfield Park Conservancy, Chicago, IL

Docents/Volunteers: Entomology Graduate Students (EGSA) 14 individuals; Michelle Duennes (part-time help SU2014); UIUC Undergraduates Christopher Petranek (weekend docent); Master Naturalists: 11 individuals; Master Gardeners Donna Nelson, Kellie Mook (Elizabeth Innes)

NOTE: We have been invited to be on the **Master Gardener Garden Walk 2015**. The theme for the year is sustainability. Master Gardeners will help with beds and plantings in conjunction with this event.

PHOTOS: Top row—Dan Herms (Ohio State), Rebecca Klaper (U. Wisc. Milwaukee), Randy Oliver (Scientific Beekeeping). Bottom row: Lesley Deem at Booker T. Washington (Elizabeth Innes, photographer)



National Pollinator Week 2014

In 2007, National Pollinator Week was officially declared by the U.S. Senate in order to recognize the importance of pollinators to ecosystem health and agriculture and to support efforts to increase awareness about pollinators. Here's how Urbana-Champaign celebrated with the rest of the nation in 2014...

Week Long Events June 16-June 22

Pollinator Food Guides at Common Ground Food Co-op Common Ground Food Co-op will have guides all around the store indicating which of the items need pollinators! Stop in and see how much of the food you eat on a daily basis wouldn't exist without out bees, flies, birds, and bats!

Pollinator Menu at Big Grove Tavern, with all pollinated dishes labeled on the menu

Pollinator Pizza at Pizza M-- with ingredients that wouldn't exist without pollinators

Saturday, June 14

Pollinator Doughnut at Pandamonium Doughnuts 7:00 AM – 12:00 PM at their booth at Urbana Market at the Square on June 14 featuring "Pollinator Doughnut" made with pollinated ingredients

Sunday, June 15

Pollination Fascination lecture series: Michelle Duennes presents "Finding new bumble bee species: Modern species-seeking and exploration" *UI Pollinatarium*

Monday, June 16

Urbana Free Library: VIP (Very Important Pollinators)! 10:00 AM – 10:45 AM Featuring the UI Pollinatarium's Lesley Deem with storytelling and pollinator-friendly seeds to take home for free

Tuesday, June 17

Pollinator Tasting at Common Ground Food Co-op 5:00 PM – 7:00 PM Tuesday's tasting pollinator-themed! Some of the graduate students involved in making the "Pollinator Guides" you'll see all around the store will be available to answer questions and serve up some interesting pollinated samples for you to enjoy.

Wednesday, June 18

Douglass Branch Library: Pollinators with Paws 3:00 PM – 4:00 PM National Pollinator Week with Lesley Deem from the UI Pollinatarium. Learn about pollinators who have paws rather than wings, such as geckos and the honey possum, then try being a pollinator yourself! This event will feature story-telling, honey-tastings, and is for school-age kids.

The Pollinator Round at Trivia Night at Pizza M 7:00 PM – 9:00 PM Test of knowledge during a pollinator-themed round of trivia at Trivia Night at Pizza M!

Thursday, June 19

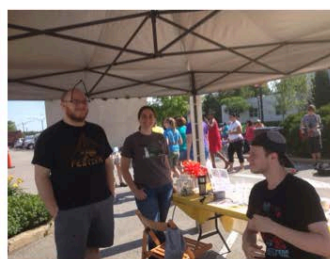
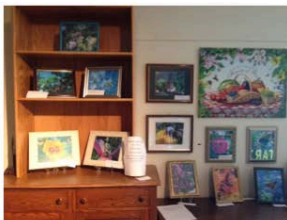
The Amazing Honey Bee by Maggie Wachter 6:00 PM – 8:00 PM. Beekeeper Maggie Wachter will take us inside the hive to discuss the evolution of the honey bee, its life cycle and how bees make honey. Some man-made and natural threats to honey bee survival will be discussed. This class is intended for gardeners, new beekeepers and anyone interested in protecting the environment.

Sunday, June 22

Pollination Celebration! *UI Pollinatarium* 12:00 – 2:00 PM Arts and crafts for kids, storytelling, and honey tasting

Nurturing Native Bees Workshop *U of I Pollinatarium* 2:00 – 3:30 PM Free workshop on how to identify bees and to help them by providing nesting habitat; participants make and receive their own native bee house.

Special Cello Performance by Samuel Araya, Community Center for the Arts *UI Pollinatarium* 3:30 – 4:30 PM



Faculty



Brian Allan. The last couple of years have been a productive time for the Allan Lab. Brian received a Coupled Natural-Human Systems Grant from NSF in support of his research in Kenya to understand the impacts of human land-use on tick-borne disease risk for humans, livestock and wildlife. This project has supported the hire of two new postdocs in the lab: Sharon Okanga, who is leading the biological research, and Steven Hockett, who is leading the human dimensions research. Two Kenyan technicians, Kadir and Henry, have also joined the team. Long time postdoc in the lab Andrew Mackay has been highly productive and recently received research funding from NIH in support of his project on the effects of green stormwater infrastructure on mosquito production in urban systems. The graduate students in the lab all have been keeping busy as well. PhD students Erin Allmann Updyke and Erin Welsh have been analyzing data collected during their field research in Panama to prepare grant applications and eventual manuscripts. Allie Gardner has submitted the first chapter of her PhD thesis for publication and already is busy preparing the next one. Allison Parker has initiated a new mosquito experiment which is likely to serve as the topic of her MS thesis. Tyler Hedlund has finished collecting data for his MS thesis and is busy analyzing data and writing up with the plan to defend in 2015 -- he will be the first graduate student to defend a thesis in the lab! MS student Tanya Josek, who is a friend of the lab, is busy analyzing data for her MS thesis, too. Former undergrad Natalie Pawlikowski has returned to the lab as an hourly technician and is helping on a multitude of projects. And undergraduates too numerous to mention are busily working on 390/490 projects, including several who will apply to graduate with distinction from SIB. All together it's a very busy but productive group! And, most importantly, the lab hosted the 2nd annual Octoberfest Party for the Entomology Department at Brian's house on the Sangamon River. It was another beautiful fall day and the Octoberfest tradition continues!



May Berenbaum. So, 2014 marked the 100th anniversary of the first report of pesticide resistance—in April 1914 A.L. Melander reported lime sulfur sprays failed to control San Jose scale in Washington state (J. Econ. Ent. 7:167-173). In honor of a century of insecticide use, I thought I'd recount this year's activities in the expressive language of pesticide trade names. It's particularly apt because the year was such a **Whirlwind** (chlorpyrifos, organophosphate registered for soil use and as a foliar spray; highly toxic to bees). In terms of **Distance** (pyriproxyfen—insect growth regulator registered as a foliar spray), I went all the way to London, England, in January for a joint Biochemical Society/British Ecological Society/Society for Experimental Biology meeting to talk about bees and pesticides and returned to the UK in March to visit the John Innes Centre in Norwich, where I gave a talk on bees and pesticides. In May, I gave two lectures at University of California Davis, one of which was on bees and pesticides, and shortly thereafter I traveled to Weston, Connecticut to talk with the Back Yard Beekeepers on bees and pesticides. In June I went to College Park to talk to the Maryland State Beekeepers Association (about bees and pesticides) and in August there was a trip to San Francisco, CA, for the International Congress on Pesticide Chemistry to give a plenary lecture on bees and pesticides. In September, I represented the Entomological Society of America at the 50th anniversary of the Australian Entomological Society in Canberra (yes, I talked about bees and pesticides). A December trip to Sacramento was a change of pace-- I was co-presenter of a talk on pesticides and navel orangeworms (*Amyelois transitella*). I hope you'll **Concur** (imidacloprid, neonicotinoid registered as a seed treatment for systemic control of root pests; highly toxic to bees) that, whatever bad things pesticides do to bees, they've opened up all kinds of travel opportunities for me!

There was plenty of **Fanfare** (bifenthrin, pyrethroid registered as a foliar spray for numerous pests-- extremely toxic to bees) for Hannah this year. Her short screenplay, “Hop-On Hop-Off”, inspired by her experience as a Chicago tour guide, was one of five finalists for best short at the Chicago Screenplay Competition, a finalist (out of 1000 entries) at the Beverly Hills Film Festival, a comedy semifinalist at Creative World 2014, and “best short screenplay” at the Broad Humor Film Festival in Venice, CA. At the Broad Humor Festival, she watched Robert Hays (of “Airplane!” fame) and Torri Higginson (of *Stargate: Atlantis*) take part in a table read of that script and her feature script “Let’s Get It Straight,” which was a finalist in the feature category. Her feature “Dummy Round” (about a ventriloquist) was a quarterfinalist at Screencraft 2014 (of 1300 entries) and “Five Star”, a sitcom pilot based on her experience as a hostess at Spiaggia, a Michelin-starred restaurant in Chicago, won “Best Pilot” at the Chicago Screenplay Competition. And, for the second year running, she won a People’s Choice award at the annual Vent Haven Ventriloquism Convention in Hebron, Kentucky. She certainly has a **Knack** (pyriproxyfen, see Distance) for entertaining people!

Another highlight of 2014 was a meeting that didn’t involve O’Hare airport—we hosted the 30th annual meeting of the International Society of Chemical Ecology. Over 330 people attended, representing 33 countries around the world and 31 U.S. states. Among the **Intrepid** (methoxyfenozide, diacylhydrazine insect growth regulator) travelers who came to Illinois in July were numerous alumni and friends in the **Discipline** (bifenthrin, see Fanfare), including Annie Ray, Emerson Lacey, Reed Johnson, Tania Jogesh, Rensen Zen, Jorge Zavala, Eva Castells, Xianchun Li, and Saber Miresmailli. One particularly special visitor was Paul Feeny, my Cornell doctoral advisor, who drove here all the way from Ithaca for the meeting.

The most exciting news, though, involves a trip to Washington, DC, not because of the destination (I go to Washington with depressing regularity) but because of the occasion. I was flabbergasted on September 30 to receive an email saying that I was to receive the National Medal of Science, an honor usually reserved for people who head up major research institutions, found new disciplines, or make profound theoretical advances (none of which I’ve ever done). On November 20, Richard, Hannah and my 88-year-old Aunt Margaret attended the East Room ceremony with me (which was surreal—the East Room looked just like it does in those movies where aliens attack and take over the government and the President himself looked and sounded exactly like he does on television). My brother Alan, sister Diane and cousin joined us at the gala banquet that evening at the Ritz-Carleton, which was just splendid—everyone looked positively **Radiant** (spinetoram, bacterial toxin labeled for use as a foliar spray).

Frankly, it was especially meaningful to receive a National Medal of Science from a science-savvy President whom I **Admire** (imidacloprid, neonicotinoid labeled for soil use, highly toxic to bees) and hold in high **Esteem** (pyriproxyfen, see Distance); he’s even a **Hero** (bifenthrin + zeta-cypermethrin) of sorts. Barack Obama is likely America’s most bee-friendly President. November was actually my second trip to the White House in 2014; on April 30, I was one of 50 people representing universities, corporations, conservation organizations, and federal agencies to attend a White House Pollinator Initiative Stakeholder Meeting to discuss the health of honey bees and other pollinators. Less than two months later, Obama issued a Presidential Memorandum for Heads of Federal Departments and Agencies, creating a “Federal Strategy to Promote the Health of Honey Bees and Other Pollinators,” in order “to broadly advance honey bee and other pollinator health and habitat”. So, on November 20, in the White House Green Room, I shook the hand of the Leader of the Free World and thanked him for caring about the bees; to my amazement, he replied, “I DO care about the bees—and we’re going to fix them!” That’s change I certainly can bee-lieve in!

Well, in view of the fact that 2015 is already almost 1/12th over, I should probably wrap up this account of 2014 and **Adjourn*** (**esfenvalerate**, pyrethroid approved for foliar applications on vegetables for multiple pests, also highly toxic to bees) until the next newsletter...(photo is me with *Xestoblatta berenbaumae*)



Stewart Berlocher.

Fame is a bee.
It has a song—
It has a sting—
Ah, too, it has a wing.

Fame is a bee (poem 1788)
Emily Dickinson

Sydney Cameron. Since the last Newsletter update, we're a bit closer to understanding the role that *Nosema bombi* (a microsporidian pathogen that can infect the midgut of bumble bees) may have played in



Images courtesy of J. James-Heinz (top left);
Leif Richardson (top right); Pete Schroeder
(bottom left); Thomas Wilson (bottom right).

the declining populations of particular species of North American bumble bees (see images on left) over the last couple of decades. Through a combination of new tools we designed to screen 10-30-yr old museum specimens for the presence of *Nosema* in the midgut, and recent DNA technology, we've been able to analyze the changing prevalence of *Nosema* over time in multiple species. We have thus learned that *Nosema* increased significantly in prevalence during the 1990s in currently declining bumble bee species, coinciding temporally with both the intercontinental movement of commercial bumble bee colonies from Europe to North America and the development of commercial bumble bee pollination in the U.S. Using next generation genome reduction and sequencing, we have also learned that *Nosema* isolates collected from bumble bees across Europe and the U.S. fall into the same genetic clade, which is distinct from the multiple differentiated *Nosema* clades found in Asian bumble bees. The absence of genetic variation among *Nosema* in Europe and North America is

notable and could suggest a genetic sweep during the period of commercial bumble bee development in the 1990s. On a related front, a group of us published a paper in *Frontiers in Ecology and the Environment* that showed the devastatingly rapid decline of the only native bumble bee species in Patagonia after commercial European colonies were shipped there in the 1990s. That decline has been linked to the coincidental introduction of an exotic pathogen transmitted via the colonies. The clear message here is that shipping commercial bumble bees outside of their native ranges is a bad idea!

In addition to studying potential causes of declining bumble bees, my students are investigating bumble bee mimicry patterns and testing hypotheses concerning selective forces that could lead to Müllerian color pattern mimicry in the wild. John Maddux is testing whether bird predation could be a major selective factor leading to pattern convergence, and Charles Dean, who is a new student since the last Newsletter, is testing the effects of environmental temperature on bumble bee color pattern. Michelle Duennes has continued to refine her population genetic studies of a Mexican/Central American bumble bee complex that resolves into multiple species across its wide range. She has been working since 2012 with undergrad Chris Petranek to add morphometric data to the patterns obtained independently from genes and microsatellites and color patterns.



This year took me to Rome in November, attending a European Union meeting as the North American representative of bumble bee decline. This was a great meeting, and Rome is a fantastic city for walking, but after two days of wining and dining—literally—I was happy to get to London, where I caught a sleeper train from Paddington Station down to Cornwall to visit Sally Corbet, pollination ecologist, whose 18th century stone cottage on the sea is a magnet for me whenever I'm anywhere near. Long walks along the coastal paths interspersed with lunches in the local pubs kept me mostly outside during a week in Nov when everyone in C-U was huddled inside with temps below zero. I also visited friends in Oxford, who took me to Blenheim Palace (Winston Churchill's birthplace), where an iconoclastic art installation by Wei-Wei was on display throughout the palace rooms and

gardens. Jim and I continue to spend a couple of weeks each August at the Dethier cottage in East Blue Hill, hiking, kayaking and eating shellfish caught in the local waters. My mother, who turned 90 this year, joined me at least once in the kayak and I can only hope I can do that when I'm 90!



Fred Delcomyn. Writing and photography take up much of my time these days. Writing has been mostly travel articles for the News Gazette and vignettes for college alumni magazines so far, but I'm still working on larger projects.

Photography-related activities have increased in frequency and diversity each year. In 2013 I joined a geology field class organized by geologist Steve Marshak to the southwest US. I was the trip photographer and biologist, providing the students not only with photographic advice but an introduction to the biology of deserts.

Two photography-related trips highlighted 2014. I joined WILL radio/TV, our local PBS station, in co-hosting an Alaskan tour and cruise as a photographer able to offer advice on picture-taking. Then in the fall, Nancy and I drove west and hit every National Park and National Monument in the state of Utah as well as places in Kansas and Colorado. The scenery was spectacular – and I've already licensed one of the images to a textbook publisher!

In addition to my ongoing participation in the Urbana Market at the Square in the summer, last year I also had a show of nature photographs at the Museum of the Grand Prairie in Lake of the Woods Park, Mahomet.

Family matters continued to delight over the past few years. We were fortunate that Julia and her two girls could visit us from New Zealand from April to August, 2014. It was wonderful for all the cousins to get to know one another – Julia's two, Erik's daughter, and Michael's son and daughter. Our next big family event will be a trip to New Zealand next winter. This will give all the cousins a chance to reconnect and bring Erik's expected new family member (due February, 2015) into the mix as well.

Unfortunately, Erik's kids will still be too young to remember anything about the trip when they're older. All the more incentive to make this more than a one-time event!

For those of you who are now away from campus, I'll mention that I have both a Facebook photography page (<https://www.facebook.com/DelcomynPhotography>) and a photography web site (<http://delcomyn-photo.smugmug.com/>). If you want to remember what central Illinois prairie looks like, or want to see a current picture of the campus or area, drop by and take a look. Both are open to anyone. If you click like on the Facebook page, you will be notified each week when I post a new image. Enjoy the photos!



Bettina Francis. I continue to work with algal toxins, but have abandoned prymnesin – impossible to get enough to work with! – for cylindrospermopsin. This is probably the most common toxin in algal blooms worldwide, and regularly poisons both people and livestock, but its mechanism of action is not known. We have identified an inbred strain of mice that is unusually sensitive to its effects, and hope to find relevant differences in gene expression between these mice and the less sensitive strains. Meanwhile, my student, Lisa Powers, completed her fieldwork and has been awarded a dissertation completion fellowship by the university: she will graduate within the year. Outside the lab, I am finally blooming more orchids than I kill, and I'm also getting better at seeing orchids in the wild – such as this *Corallorhiza maculata* we saw near Bozeman – a much better picture for the newsletter than one of me!



Larry Hanks. Since the 2012 newsletter, students Linnea Meier and Christina Silliman received their master's degrees, and Rob Mitchell moved to U. Arizona for a postdoc. My spouse Jean continues to manage the Office of the Dean in the College of Engineering, and is very happy there. Our daughter Rebecca is now a Junior at Urbana High School and continues to play soccer and practice the piano, while Mason finishes middle school this year and also is thriving in the virtual world of Skyrim, whatever that is.



Allison Hansen. I arrived late summer 2013 to start my appointment, and I still feel like I am flying by the seat of my pants. My lab's renovation on the third floor of Morrill Hall finished in late October 2013, and I rapidly seeded it with undergraduates. After the legendary 'Polar Vortex' (Fig.1) I taught and developed my first class in Spring 2014, called *Bioinformatics and Human Genome*. I did not realize how time-consuming it is to make a brand new 'active learning' course from scratch: very late nights that sometimes turned into mornings. I do enjoy the class content and design, as it keeps me up-to-date with cutting-edge genomic and bioinformatics discoveries and technologies. During the spring 2014 semester, I also mentored four undergraduate researchers on independent study projects in my lab.

Andrew Jang, my hourly lab tech, also joined the lab at this time. Andrew is a master at growing plants and maintaining our lab aphid colonies. Finding him was a stroke of luck since my aphid colonies almost collapsed several times during the 2013 Fall semester. I hosted a visiting postdoc fellow, Dr. Eva Nováková, from the Institute of Parasitology České Budějovice, Czech Republic, during the Summer of 2014. I mentored and trained her in my lab on molecular genetic, genomic, and bioinformatic techniques focusing on insect-microbe interactions. We hope to submit a paper soon on novel wet lab techniques we developed during this time. She is currently a postdoc in Rob Knight's lab researching microbial diversity.

In the late summer of 2014 my lab's first two publications were accepted in the *Journal of Chemical Ecology* and *International Society of Microbial Ecology Journal (ISME J)*. The *Journal of Chemical Ecology* article is an invited review that my co-author (Clare Casteel) and I wrote on how microbes can influence insect-plant interactions. This review was largely inspired by the successful ESA symposium that Clare and I put together in Austin, TX in November of 2013. Clare was a PhD graduate student back in the day in May's lab! She recently landed a position as an assistant professor in Plant Pathology at UC Davis this fall 2014. The *ISME J* article that I published with co-author Patrick Degnan

(Fig.1), excitingly reveals for the first time that a bacterial symbiont with a reduced genome exhibits differential protein expression. This is shocking because it was previously assumed that symbionts with reduced genomes, which are primarily found in insects as obligate nutritional symbionts, lost the genetic ability to regulate gene expression. We further discovered that gene expression is regulated at the post-transcriptional level, potentially by small RNAs. Intriguingly, the expression of some of these small RNAs is conserved for >65 million years in these tiny symbiont genomes. If these genomes rely primarily on small RNAs for gene regulation, instead of proteins, this could be a prime example of how genomes revert back to the “RNA world” for gene regulation.

With the start of the Fall 2014 semester, two PhD graduate students, Margaret Thairu and Dohyup Kim, joined my lab! Margaret’s work is currently focused on how the gut microbiome of hemipterans influence insect ecology and evolution. Dohyup’s work is focused on how aphids regulate their shared amino acid metabolism with their obligate symbiont, *Buchnera*, at the epigenomic level. Three undergraduates also joined the lab Fall 2014 to conduct their own independent studies. Luckily these budding scientists decided to stay in my lab this spring semester to continue their promising genomic and bioinformatics projects. One of these students is almost done sequencing, assembling, and annotating a new insect symbiont genome! This fall I also got the pleasure to redesign and teach the 100-level course *Animal Biology* with my colleague Bettina Francis. Teaching a 100-level course was quite a challenge compared to a 300-level course; what a wake-up call this was for me.....as I previously mentioned, I feel like I am flying by the seat of my pants.

This spring 2015 I am teaching my *Bioinformatics and Human Genome* class again. I am excited about this second opportunity to refine the in-class active learning techniques, tweaking and tuning the classroom bioinformatics assignments. My efforts have been facilitated this semester as we have been relocated to the Huff Hall. In turn, student laptops are no longer falling off desks, and I do not have to drag two 50 ft. extension cords with power strips to class every day so students can plug their laptops in. Later this spring I will be hosting a visiting postdoc fellow from The Ohio State University, Dr. Raman Bansal, who received funding from Insect Genetic Technologies Research Coordination Network to train in my lab on a novel insect-microbe genetic technique I’ve recently developed in my lab. Stop by and say ‘Hi!’ to Dr. Bansal this February-March!



Alex Harmon-Threatt. Hello all! I am happy to introduce myself to the community. I started here as an Assistant Professor in November 2013 after completing an NSF post-doctoral fellowship at Washington University and my PhD at UC Berkeley. Since my arrival I have been busy setting up my lab and bringing in new students. In this short time the lab has grown to include 2 graduate students and 5 undergraduates. The lab has been investigating a number of areas of pollination ecology with a particular interest in understanding how plant community restoration and management affect pollinator communities and interactions. This first summer was quite busy, with 3 projects stretched across 2 states.

With an estimated 80% of flowering plants benefiting from or requiring pollinators, any change in pollinator populations can have significant effects on natural and agricultural communities. Recent declines in bee populations, in particular, have highlighted how little we know about these important insects in their natural environments. The work in my lab focuses on addressing questions that can help improve our knowledge of pollinators in natural environments and also can be applied to conservation. This includes questions such as: What kinds of plants do bees prefer and what role does nutrition play in their decision?, Do local or landscape features more strongly structure bee communities?, and How do bees respond to different restoration methods?.





Barry Pittendrigh. The Pittendrigh lab has had a very productive and exciting year beginning with our outreach program, Scientific Animations Without Borders (SAWBO) sawbo.illinois.edu. For those of you that don't know us, SAWBO is a University of Illinois based program that transforms extension information on relevant topics such as agriculture, health and women's empowerment, into 2D and 3D animations, which are then voice-overlaid

into a diversity of languages from around the world and disseminated freely via cell phone technology. SAWBO works with local development groups in Africa, Asia, India, and North and South America to identify areas of educational need and develop animations that meet those needs.

This year SAWBO launched its first Newsletter and developed 14 new animations, including our much-awaited one on Ebola prevention with the University of Illinois and Sierra Leone YMCAs, Njala University in Sierra Leone, UIUC medical students and with volunteers from several international health agencies. SAWBO currently has 45 video animations distributed worldwide in over 85 different language variants. Over the past year we have updated our video library with over 200 new language voice-overs. Our newest and soon-to-be-released venture is our SAWBO App, which will allow access to SAWBO's entire video library on a smart phone. It will allow people to easily grab our materials, when connected to WiFi, and then deploy them to other people's cell phones with a click of a button. SAWBO is also continuing to collaborate with the University of Illinois Medical School in Chicago to develop content useful for needs in Illinois. SAWBO was also featured on the Big Ten Network this past year, along with a one-minute spot for every Illini basketball and football game.

SAWBO continues to expand and grow as our educational materials reach more and more people worldwide. One example has included a partnership with the Ethiopian Agricultural Transformation Agency that has deployed the SAWBO materials out to over 600 extension agent offices that are responsible for deploying educational materials to over 150,000 Ethiopian farmers. With this expansion and continued growth we are pleased to welcome several new faces to our program. Victor Font recently joined our group as our Communications Coordinator, Anna Pérez as our Video Editor, and Ben Blalock as our Production Manager.

As co-directors of SAWBO, Dr. Pittendrigh and co-founder Dr. Julia Bello-Bravo (Center for African Studies) continue to receive awards for their program. In 2012 SAWBO received the Champaign-Urbana International Humanitarian Award (CUIHA). In 2013, Pittendrigh and Bello-Bravo received the University of Illinois Campus Awards for Excellence in Public Engagement. Recently, it was announced by the Innovation Celebration committee that SAWBO was nominated for the Entrepreneurial Excellence: Social Venture Award and has been selected as a finalist. In addition, Dr. Pittendrigh recently received the Distinguished Professional Achievement Award from the University of Regina where he received his BSc Honors in 1990.

On the entomology and toxicology side of the research lab, Dr. Weilin Sun has identified a mutation in the putative transcriptional regulator gene ERR and linked it to P450 expression changes in *Drosophila* (Plos ONE in press), using transgenic flies. Dr. Carmen Valero has helped with ERR work and continues her work with *Callosobruchus maculatus* transcriptome. Graduate student Keon Mook Seong has been busy working on DDT resistance in *Drosophila* – as our lab has elucidated new sets of genes involved in pesticide resistance through the use of a selective sweeps analysis.

Dr. Tolulope Agunbiade, after having received the Howard Hughes Pre-Doctoral Fellowship for her work on IPM-omics and SAWBO in West Africa, has graduated with her PhD. She is now a post-doctoral fellow in the medical school at Yale University. As a graduate student in the lab, Laura Steele continues to work toward her PhD project regarding the molecular basis of DDT resistance and remains involved in SAWBO, working with collaborators on the script writing and script development process. Susan Balfe continues to play an active role with SAWBO, managing many organizational aspects of our

program, including development and maintenance of our databases. She also manages all aspects of our research laboratory keeping our lab compliant, highly functional and productive. Her most recent research efforts have focused on cowpea weevil activity acoustics monitoring. Dr. Brett Olds, co-advised with Dr. Ken Paige, found his dream job in Hawaii and is now building his own laboratory program.

Finally, this past year, the Pittendrigh laboratory received a grant from the Bill and Melinda Gates Foundation, building on our long-term USAID funded efforts on cowpea pest management in West Africa. The SAWBO program has also been funded by the ADM Institute for the Prevention of Postharvest loss and USAID to develop scalable educational content on postharvest loss prevention in Bangladesh, Ethiopia, Guatemala and Ghana.



Hugh Robertson. As I start to think about retirement, we still have quite a few insect genome projects we have undertaken in the laboratory to finish up. Prominent among these are the *Rhagoletis* and *Diabrotica* projects that are still proving difficult. Meanwhile others are finishing their genome projects and I keep agreeing to help with annotation of the chemoreceptors in them, such as a centipede, termite, tsetse fly, house fly, Hessian fly, and bumblebee, all published now, while *Metaseiulus*, *Ixodes*, *Ceratitidis*, *Cimex*, *Oncopeltus*, *Frankliniella*, *Rhodnius*, *Ladona*, and *Anoplophora* are ongoing. A highlight of the past year was co-organizing with Gene the 8th Arthropod Genomics Symposium here in Urbana. This meeting was started by Susan Brown at Kansas State and now rotates between them, Notre Dame, and us. I think the meeting went very well, and it looks like I will still be here for the next one.

On the personal side, Erica is now 16 and driving and starting to focus on college, while playing soccer and experimenting with dyeing her hair. Gabriel finally graduated from UIUC and has moved with his girlfriend to Seattle to work in his uncle's company there; they seem to be settling in well. Christina bought a nearby tiny home and has spent the last year renovating it for a very slow flip. And I write this from Cape Town where once again I am visiting my mother and sister for a combination of excellent kitesurfing and mountain hiking in the warm South African sunshine. My return to Illinois will coincide with some excellent lake ice for ice sailing, although it is unlikely to compare with last year, which produced the best winter we've seen in a long time.



Gene Robinson. It is a pleasure to reconnect with the Illinois Entomology family and tell you what my lab and I have been up to over the past two years. It's been a good few years.

We continue to strive to understand the mechanisms and evolution of social behavior, relying mainly on honey bees, and occasionally on other species as well. One exciting advance in the lab has been the development of technologies to automate our monitoring of bee behavior, both in and out of the hive. Thanks to the stellar efforts of Paul Tenczar we have been able to use RFID technology to monitor bee flight activity automatically, using a procedure similar to highway EZ-PASS or I-PASS systems. Bees wearing RFID tags pass a laser sensor at the hive entrance, which records all their comings and goings. Paul then wrote computer programs to synthesize all the vast amounts of data and, together with Institute for Genomic Biology (IGB) and Physics Professor Nigel Goldenfeld and his graduate student Vikyath Rao, generate meticulous life-time activity records for thousands of bees. Paul was uniquely suited to develop these capabilities for us, as he is a retired computer entrepreneur who also has been a hobby beekeeper in Urbana for 45 years.

Using this unique and powerful system, citizen-scientist Tenczar joined up with Claudia Lutz, a 2012 graduate of the Neuroscience Program, to make a fascinating discovery: only 20 percent of foragers do 50 percent of all the foraging! However, membership in this elite club was surprisingly flexible because when the 20% were removed from the hive, less hard-working bees raised the level of their activity, forming a new elite. Who are these bees and how do these differential abilities arise? The study opens up all sorts of interesting nature/nurture-type questions that we hope to address in the future. The scientific paper was published in *Animal Behavior*, and summarized nicely in an article and video by

James Gorman in the *New York Times* (<http://www.nytimes.com/2014/09/09/science/no-glass-ceiling-for-worker-bees.html>). Check it out!

In another project, research led by postdoctoral associates Clare Rittschof and Hongmei Li-Byarlay showed that it's possible to actually increase aggression, in both honey bees and fruit flies, by decreasing a certain type of metabolic process in the brain that involves oxidative phosphorylation. As a bee partisan, I must admit that fly aggression is not as dramatic as bee aggression; aggressive bees are more likely to bite and sting an intruder, while flies just lunge at each other more. But flies afford more precise genetic manipulations than do bees, enabling more robust experimentation so they definitely are useful.

Clare also led a large team of biologists and bioinformaticians at the Institute for Genomic Biology that found changes in brain metabolism associated with responses to social challenges in honey bees, stickleback fish, and mice. We are very excited about the aggression work, which was published in two papers in the *Proceedings of the National Academy of Sciences*. Finding such similarities in flies, bees, and vertebrates suggests that connections between brain metabolism and social behavior are of fundamental importance.

Findings with immediate practical implications emerged from research led by Marsha Wheeler, who received her Entomology PhD in 2013 and is now a postdoctoral researcher at the University of Washington. Marsha explored the effects of different types of diets on honey bees by using state-of-the-art RNA sequencing technology to measure differences in gene activity for all the genes in the genome. The results, published in *Scientific Reports*, showed that honey really is special to bees—other types of carbohydrates cause differences in gene activity, including in genes related to protein metabolism, which is central to proper functioning. Poor nutrition is one factor that has been implicated in the alarming declines in bee populations over the past eight years, and this research suggests a possible explanation.

One of the more surprising results we obtained over the past couple of years came from a study led by graduate student Nicholas Naeger that we performed in collaboration with the laboratory of Andrew Barron, a former postdoctoral associate in my lab who now works at Macquarie University in Sydney, Australia. Nick tried to tip the delicate balance in the beehive between cooperation and competition by removing the queen and all the eggs and larvae that might be used to rear a replacement queen. Under these circumstances some worker bees activate their dormant ovaries and begin to lay eggs. We figured that once active as egg-layers, these bees would no longer cooperate with each other as they do when they are sterile and their queen does all the egg-laying for the whole colony. But we were wrong! Egg-laying workers still cooperate in foraging and nest defense tasks. As we speculated in the paper reporting these findings in *Current Biology*, they appear to revert to an earlier stage of bee social evolution characterized by bees that “do it all” rather than partition tasks the way honey bees do. We are very interested to know how these ancestral traits still persist and are regulated by the brain. This work also attracted attention from the press and was a *Science Magazine* Editor's Choice.

All of our lab's research would not be possible without the excellent oversight, management, and training provided by lab manager Amy Cash Ahmed and bee lab manager Charley Nye. This is especially the case as I continue to split my time between running my lab and running the Institute for Genomic Biology (<http://www.igb.illinois.edu/>), one of the flagship multidisciplinary research institutes on campus.

I also continue to be active in national activities. I was asked to give testimony to the House Subcommittee on Research and Technology in July 2013 for a hearing on “Frontiers in Brain Research” related to President Obama's BRAIN Initiative. I also was privileged to chair the 2014-2015 National Academy of Sciences-Keck Foundation “Futures Initiative,” which this year focused on collective behavior, “from cells to societies” and reaching to robotics. This joint initiative seeks to encourage multidisciplinary research on major scientific issues, with a unique program that involves awarding up to one million dollars in seed grants for the best ideas that arise from a workshop. The workshop was extremely stimulating and as this Newsletter goes to press we are poised to start awarding the grants.

This year marks the 25th anniversary of my joining the faculty at Illinois and founding the Illinois Bee Research Facility. I could not imagine a more supportive and stimulating academic home than our Department of Entomology, and I look forward to many more years together.



Andy Suarez. Sabbatical in Darwin, Australia—In February, Elissa and I left cold and snowy landscape of Illinois and went to Darwin, Australia for my first sabbatical. I worked as a visiting scientist with Ben Hoffmann at CSIRO. Ben and his supervisor Alan Andersen are experts in the Australian myrmecofauna particularly in relation to ecosystem function and biological invasions. It felt great to get back into the field, to start new projects, and enjoy the wildlife of Australia’s remote Northern Territory.



We conducted research on the invasion genetics of the tropical fire ant (*Solenopsis geminata*) and behavioral mechanisms of invasion success in the yellow crazy ant (*Anoplolepis gracilipes*). We also started a few collaborative projects between my lab and CSIRO. Bill Wills spearheaded a paper on morphological variation among populations of the invasive big-headed ant (*Pheidole megacephala*). Adrian Smith is analyzing the cuticular hydrocarbon profiles of furnace ants (*Melophorus anderseni*) to determine how they can successfully parasitize colonies of meat ants (*Iridomyrmex* spp.). This work is being done in collaboration with an undergraduate student working in Darwin from Terry McGlynn’s lab at California State University in Dominguez Hills (who coincidentally will be an Entomology colloquium speaker in Spring 2015). Finally, Fred Larabee is sequencing Australian trap jaw ants in the genera *Odontomachus* and *Anochetus* to help resolve species boundaries in Australian *Odontomachus*.

In addition to working in Darwin, we visited universities and CSIRO labs in Canberra, Adelaide and Cairns during my visit. We ended our Australian adventure by spending a month in Cairns where we attended the conference for the International Union for the Study of Social Insects (IUSI). After the meeting, I spent two weeks in the Maliau Basin in Borneo to help teach the California Academy of Science’s “Ant Course”. A highlight of this trip was finding some rare ants including trap jaw ants in the genus *Myrmoteras*, the vampire ant (*Mystrium camillae*), and foaming ants in the genus *Pseudoneoponera*. While we are very happy to back, we are already looking forward to my next sabbatical.

Other exciting news from the Suarez lab includes adding a new Entomology student this fall - Josh Gibson - and the successful PhD defense of Jo-anne Holley, who is now a postdoc in the University of Texas in Austin. Congrats Jo!



Charles Whitfield. I continue to work with former postdoc Amro Zayed on a large data set obtained from our NSF systems grant, a large “eQTL” project that will map genetic polymorphisms affecting juvenile hormone level and gene expression in the brain of the honey bee, *Apis mellifera*. Help from Gene Robinson allowed us to finish collecting microarray data for our target sample size of about 300 individual bee brains. The other area I’m working on is analysis of variation in the honey bee genome. This effort is facilitated by a large and growing set of completed individual *Apis mellifera* genome sequences.

In December 2014 my IB270 Honors students presented six excellent posters outlining their “discovery” projects exploring gene function in the model nematode *Caenorhabditis elegans*. These students created and justified their own hypotheses about gene function back in September, then designed and implemented experiments to test these hypotheses over the course of the semester. This semester I teach IB432 Genes and Behavior.

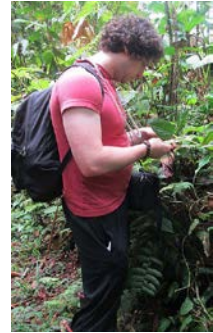
For fun, I’ve been traveling a lot lately with my wife Joanna Shisler while she works with civil engineers on water quality (specifically, viruses) in places like Uganda and Nepal. This past summer I met up with her in Ho Chi Minh City to help engineering graduate students conduct PCR on dubious water samples collected from streams in Nepal (apparently, bringing to US was not an option).



James Whitfield. 2013 and 2014 has seen some turnover, and some major activity, both here and abroad, in the Whitfield lab. Our NSF-funded neotropical tritrophic studies took the lab graduate students and me to Panama in early summer 2013, where we joined a team from the University of Cincinnati to sample *Eois* (Geometridae) caterpillars on *Piper* plants of many species, with the aim of rearing out the adult moths and the parasitoids of the caterpillars. Kyle Parks (see photo)

continues to work on that project, especially on the phylogenetics of the microgastrine parasitoid wasps.

Also on that trip were Diana Arias-Penna and Andrew Debevec (also see photos). Diana completed her PhD dissertation, a massive work on the hyperdiverse braconid wasp genus *Glyptapanteles*, in Fall 2014 and returned to her native Colombia (and just had her first child, Andres!). Andrew completed his MS project on the braconid wasp genus *Xanthomicrogaster* later in the fall and now works with Atlas on campus.



Also in the lab entering 2013-14 were postdoctoral associate Alex Wild and undergraduates Yali Zhang and Wilhelm Salmen. After completing the series of NSF-funded projects on the huge neotropical genus *Heterospilus*, Alex began a highly productive stint as a freelance insect photographer before becoming Curator at the University of Texas Insect Museum. Yali graduated in 2014 with the department's Outstanding Undergraduate Research Award after publishing two coauthored taxonomic papers, and Wil continues to work on a paper characterizing previously confused species of the genus *Papanteles*.



Beyond the Panama trip, 2014 took me to the Netherlands (Leiden) for a phylogenetic networks workshop as part of my Center for Advanced Study Associateship. The same project will take me to Singapore in the summer of 2015. Not long after returning from Leiden, I assumed the Presidency of the International Society of Hymenopterists at its Quadrennial Conference in Cusco, Peru. It was a great conference, with an amazing field excursion afterwards to Machu Picchu (see photo above!). Sydney and I also made it both years to our favorite summer vacation spot in Maine at the Dethier cottage.

In 2014, a collaboration with Hugh Robertson and Kim Walden of our department, and Gaelen Burke and Mike Strand of the University of Georgia, led to the complete sequencing of the *Microplitis demolitor* genome, and characterization of the genome organization of this wasp's polydnavirus. A broader summary of the *Microplitis* genome is to follow in 2015.

Also in 2014, the third printing of my textbook finally appeared, with many corrections of annoying misprints from the original printing. I am happy to have it finally in its intended form!

Affiliates and Associates



Marianne Alleyne. Greetings all. Can you believe I am now in my 20th year at the University of Illinois? When Andrew and I first moved here, he promised I would not have to grow old here...now I am getting awfully grey...and am perfectly happy right where we are.

Since the last newsletter a lot has happened. I have become, sort of, the go-to person in SIB for online education -- both for pedagogy and technology. I still teach the graduate Insect Physiology course, but one of the more popular courses I teach is an online course on Bioinspiration. My goal with this course is to get non-biologists to appreciate nature more, to learn to look at nature for inspiration for new technologies or processes, to make nature part of their "tool-box". On the other hand, I hope that the course teaches biology majors to "own" their career choice, to learn about another area where basic research into biological structures and process is absolutely essential for our society. Of course, insects are prominently featured throughout the course.

I am still the Graduate Director for the online Master's in Science Teaching of Biology. We are able to expose middle and high school teachers to the latest developments in Biology (e.g., BioInformatics, Darwinian Medicine, BioInspiration, etc.), get an advanced degree which helps their career, while they can continue to work at their jobs and be with their families. The program is growing by leaps and bounds, but we can always use more...so if you know any middle and high school teachers who are looking for a Master's of Science degree please send them our way.

For the past 3 years a big chunk of my time was taken up by my duties for the Entomological Society of America. I served as co-chair of this Annual Meeting Program Committee. It was an absolute blast to help put together 3 very successful Entomology meetings and to represent our Entomology Department in this fashion. I am very hopeful about the future of ESA since right now we have a great staff and leadership, including May Berenbaum as President.

I was recently elected to the Inaugural class of ESA Science Fellows. As a Science Fellow I will learn to promote entomology and entomological research at the federal level. Wish me luck.

Over the last few years I have also become more active on social media in an effort to getting better at, and promote, science communication. I absolutely love the contacts I have made through Twitter and writing a blog. Check out my efforts by following me on Twitter @Cotesia1 or reading my blog <http://insectsdiditfirst.com/>



Sam Beshers. Although I still spend the majority of my time working with the Neuroscience Program, I am actively engaged in research, mainly developing simulations of division of labor in social insects. Simulations are both exciting and frustrating; they have great potential, but they also require programming, which I do slowly at best. I have a couple of computer scientists working with me and we are starting to accumulate results. The next couple of years should be really interesting.

Edward DeWalt.



Chris Dietrich. Activities in the Dietrich lab over the past year focused on phylogenomics of hemipteroid insects, systematics and cybertaxonomy of leafhoppers and treehoppers, and large-scale collection digitization. Department alumna and current entomology professor at the Universidad Federal do Rio de Janeiro, Daniela Takiya, received a Science Without Borders grant from CNPq (the Brazilian NSF) that enabled Dietrich and postdoc J. Zahniser to travel to Brazil, teach a short course (see group photo), and conduct field work in Brazil and Argentina. Dietrich was also

invited to participate in similar projects in Guizhou and Shaanxi, China, where he presented lectures, conducted field work and worked with students and faculty on leafhopper-related research. The lab hosted a visiting professor from Anhui Agricultural University and a visiting postdoctoral fellow from Brazil, and is currently hosting a visiting PhD student from Northwest Agricultural and Forestry University in Shaanxi. The InvertNet technical team, consisting of faculty and students from University of Illinois Computer Science and ECE, finished building 13 insect drawer digitizing robots and delivered them to the Illinois Natural History Survey and collaborators at institutions throughout the upper Midwest, enabling them to capture high-resolution, whole-drawer images of their pinned insect collections and post these at invertnet.org.

Michael Gray.



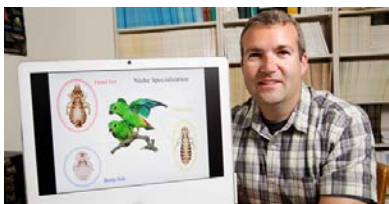
Sam Heads. The past two years have witnessed much expansion at the Heads Lab. We have seen the addition of graduate students Nathalie Baena and Daniel Swanson (co-advised with Steve Taylor), both of whom are working on the systematics of modern and fossil insects, and the arrival of Jared Thomas, who took up his position as Paleontology Research Technician and has been providing invaluable support to our research efforts. We moved into a larger facility in the Natural Resources Studies Annex (NRSA, or simply “the Annex”) on South Griffith Drive, which has allowed us to establish dedicated fossil preparation and microscopy/imaging labs, as well as providing dedicated storage space for the INHS paleontology collection.

This, along with expanded office space for everyone, has greatly increased our research infrastructure and we are all very happy in our new home.

With the award of a Thematic Collections Network (TCN) grant from the National Science Foundation (NSF), we have started digitizing in earnest the INHS fossil insect collection. This work forms part of a large collaborative project administered under the NSF ADBC (Advancing Digitization of Biodiversity Collections) program. Involving six other institutions (University of Colorado Boulder, American Museum of Natural History, Harvard Museum of Comparative Zoology, University of Kansas Biodiversity Institute, Virginia Museum of Natural History, and Yale Peabody Museum), the project will ultimately see fossil insect data (including images and metadata) made available publically via the new iDigPaleo web portal. More information about the project is available at the website: <http://fossilinsects.colorado.edu/>

This year has also seen the award of a State Wildlife Grant (SWG) from the Illinois Department of Natural Resources and the US Fish and Wildlife Service, to study the use of insects as indicators of habitat quality and ecological integrity in Illinois prairies and savannas. This grant accompanies a revision of the Illinois State Wildlife Action Plan, which has seen significant additions with respect to insects, with more taxa than ever included on the list of Species in Greatest Need of Conservation. The project will focus primarily on grasshoppers and butterflies and the fieldwork component will be led by graduate student Katie Dana (Berenbaum Lab).

The major highlight of our year however, was the publication of *Electrotettix attenboroughi*, a new genus and species of fossil pygmy grasshopper (Orthoptera: Tetrigidae) from the Early Miocene Dominican amber. This discovery was widely covered in the international media and was accompanied by a mini-documentary produced by the UIUC News Bureau featuring none other than Sir David Attenborough himself. The video can be found at: <http://youtu.be/kN8pGc3-odY>



Kevin Johnson. The past two years have seen the graduation of Entomology PhD student Scott Shreve from my lab. Scott landed a two-year teaching position at Centre College in Kentucky. Congratulations Scott! Two new post-docs, Julie Allen and Bret Boyd, and one new graduate student, Patrick Gero, also joined my lab and they have been great! On the research front, I have been kept busy with an NSF Assembling the Tree of Life grant focusing on the hemipteroid insect orders, which is

collaborative with Chris Dietrich and Hugh Robertson. We are planning a major workshop in June, 2015, which will bring together about 30 people to the University of Illinois to talk about hemipteroid insect morphology and phylogenomics. It is very exciting times for molecular systematics and we have sequenced over 100 insect transcriptomes and over 30 genomes so far and are looking forward to the finishing the analyses and seeing the results. Other than learning two entirely new languages (genomics and bioinformatics), I have also gotten to travel with Chris collecting in Chile, which was very productive. I never thought collecting moss bugs (Peloridiidae) would be so fun!



Brenda Molano-Flores.



Juma Muturi. Mosquitoes are an important group of insects to study both from ecological and public health perspectives. They not only transmit some of the most deadly diseases of human, veterinary, and wildlife significance but also serve as suitable model systems for understanding ecological principles such as intra- and interspecific competition, predator-prey-interactions, and invasion biology. Over the last two years my lab has focused on understanding how ecological interactions influence the risk of human exposure to mosquito-borne pathogens. These included understanding the outcome of virus-virus interactions within the vector, the impact of exotic invasive shrubs on native and invasive mosquito species, and tripartite interactions between mosquitoes, viruses, and gut microbes. During this period, some major changes have also occurred in the lab with the retirement of Dr. Richard Lampman and Ms. Nina Krasavin and the addition of two post-doctoral researchers (Drs. Jeffrey Bara and Eva Buckner) and two graduate students (Ms. Allison Gardner and Ms. Allison Parker co-advised with Dr. Brian Allan). Dr. Brian Anderson and I also organized a symposium in Nairobi, Kenya, where students and scientists from local universities and research institutions met and discussed the challenges and opportunity for the control of major vector-borne diseases in Africa.

Jim Nardi. During the last year, *Manduca* larvae, ladybird beetles, and innumerable Hemiptera have not only shared a laboratory with me but have also revealed some secrets of their physiology.

Dermal cells of insect larvae are some of the largest, if not the largest, cells in insect bodies; but the function of these cells that grow and shrink according to the molt cycle remains a mystery. With tissue culture, immunolabeling, ultrastructural studies and proteomics, we are discovering an unexpected role for these cells in the lives of larvae.

With Rosanna Giordano and Peter Yau, I am completing an ultrastructural and proteomic study of the very atypical midgut of aphids. Unlike other adult insect midgut epithelia whose stem cells assure that they undergo continual cell renewal, midgut epithelia of aphids lack stem cells but resort to extensive autophagy to survive defense compounds and osmotic stress of their host plants' phloem sap.

A year-long survey of hemipteran guts revealed the exceptional interplay and intimacy of specific bacteria and trypanosomes that dwell in special midgut chambers (caeca) of members of several families among the herbivorous Hemiptera. Margaret Thairu, Allison Hansen and I will be taking a closer look at the biology of one of these symbiotic relationships in the family Berytidae (stilt bugs).

Investigating the effects of *Bacillus thuringiensis* (Bt) toxin on stem cells of insect midgut epithelia began as a special project developed for a freshman research course (IB199). According to the manufacturers' label, the Bt pesticide we applied is specific for Lepidoptera; but the toxin definitely takes its toll on Coleoptera as evidenced by what we observed at the cellular level. The Bt toxin damages the midgut cells of beetles as well as caterpillars; but only midgut stem cells of ladybird beetles are able to mount a massive membrane repair effort that we are characterizing at the cellular and molecular level.



Discoveries in the Garden (to be published in 2016) explores the garden's world of vegetables, weeds, insects, and other creatures. The book presents plant biology through a series of observations and experiments that combine the pleasures of gardening with the pleasures and ease of experimentation with plants.

Susan Ratcliffe.



Leellen (Lee) Solter. The major research thrust in my lab for the past several years has been nosema disease in honey bees with post-doctoral research scientist Wei-Fone Huang, and with Drs. Peter Yau and Brian Imai at the Biotechnology Center here on campus. We are now exploring the proteome of the microsporidian pathogens *Nosema ceranae* and *Nosema apis* to search for genes or proteins that could be targeted for nosema control without harm to the honey bee host. We are saying ‘good-bye’ to Wei-Fone at the end of January. He has accepted an exciting principal research position at Fujian Agricultural and Forestry University in China where he will continue his research on honey bee pathogens.

The one-week “Short Course in Insect Pathology” for graduate students and other interested scientists will be taught again in 2015, this time at Cornell University, co-organized with Dr. Ann Hajek. I am also working with Marianne Alleyne and Tanya Josek to rewrite the insect pathology course (IB-483) in an on-line format. I remain active in the Society for Invertebrate Pathology and am organizing a one-day symposium on Microsporidia as Emerging Pathogens this year supported by a grant from the OECD-CRP.

The ‘Old House’ in Urbana is officially in permanent remodel status and a small prairie at the Salt Fork River place is coming along fairly well (why didn’t anyone tell us about red clover?!). A new hobby (also at the river) is beekeeping, although I’m sure apiculturists would place us in the neophyte category of “bee hobbyists” at this point. Nevertheless, I’ve learned more about honey bees in one year of owning a hive than in 6 years of research!

Joe Spencer.

Felipe Soto-Adames.

Saurabh Sinha.



Steven Taylor. Since the last newsletter, my laboratory has seen one student, Alan Yanahan, successfully complete his MS thesis, which resulted in a peer-reviewed paper published in *Biodiversity and Conservation* in 2014. Alan has moved on to Arizona to pursue a PhD, studying ground beetles. Filling the void, two new entomology graduates students have joined the lab. Dan Swanson (left, in photo), co-



advised with Sam Heads, is interested in systematics and has already produced a variety of published papers, including, most recently, collaborating on a 180-page monograph revising a group of katydids. His current work focuses on Heteroptera. Scott Cinel (right, in photo) joined the lab in 2014 on a fellowship and is interested in tropical ecology. He is so interested that he is presently in Panama! My work continues to focus on cave ecosystems, and the recent addition of post-doctoral researcher Matt Niemiller, who shares an interest in cave ecosystems, has kept us hopping with a variety of cave and karst related projects.

David Voegtlin.

Richard Weinzierl.

Academics/Postdoctoral Scholars

Susan Balfe.



Lesley Deem. I am starting my seventh year at the Pollinarium. I am still enjoying teaching and learning about pollinators and plants. I appreciate all the help from graduate students, undergraduates and master naturalists to run our programs. It is still a half-time position so another part of my time has been spent on several things since the last newsletter. I became the greenhouse coordinator for the Illinois Natural History Survey until it closed in August of 2015. Then I started working with Susan Ratcliffe in the college of ACES on School Integrated Pest Management (IPM).

I am continuing to learn more about honey bees and native bees. We hosted a workshop on bumble bees run by the Illinois Department of Natural Resources (IDNR) and will host another native pollinator workshop next year.

I took up quilting again this year at home and at the Pollinarium with the traveling quilting bee. I also like spending time at home in my garden with my dog Honey Bee.

Come on out and visit us at the Pollinarium.



Page Fredericks. I am a broadly trained biologist with a doctorate in innate immunity and two postdocs in the molecular biology of innate immunity and host-pathogen interactions. I am currently the lab manager and molecular biologist in the vector-borne disease ecology lab of Dr. Brian Allan. The lab focuses on the effects of global change and wildlife conservation on the dynamics of vector-borne diseases. I use and develop molecular tools primarily to identify the pathogens vectored by ticks and mosquitoes in the Midwest (USA) and in Kenya (Africa).



Terry Harrison. I am interested in biosystematics of Nearctic microlepidoptera. I recently described several new species of microleps from Illinois, including two prairie-restricted species of Gelechiidae and an *Orbexilum onobrychis*-feeding tortricid, and I am now in the process of describing four new prairie-restricted species of the genus *Filatima* (Gelechiidae) from Minnesota. I recently collaborated with Donald Davis and Charles Mitter on LepTree, which is part of the Assembling the Tree of Life project, as a result of which I was a coauthor on a recently-published molecular phylogeny of the most primitive ditrysian moth lineage, the superfamily Tineoidea. As of 2013, I have been a collaborator on a five-year NSF-funded project, part of which will involve using next-generation sequencing techniques to produce a global phylogeny of the gelechioid moth family Momphidae, of which I will monograph the North American component for the *Moths of America North of Mexico* (“MONA”) series. In addition, my research involves analyses of arthropod biodiversity in biofuel crops and native prairie. I am also the scientific coordinator for BeeSpotter, a citizen-scientist-based initiative for monitoring bees in Illinois.



Andrew Mackay. I am a postdoctoral researcher working with Dr. Brian Allan. My research interests relate to the ecology and behavior of mosquitoes of public health importance. My current research focuses on how the adoption of emerging practices for managing stormwater (e.g. “Green Infrastructure”) can influence the abundance of urban *Culex* species mosquitoes, and the efficacy of measures taken to control these mosquitoes in stormwater management infrastructure. To examine this question, we are currently completing a four-year field study evaluating the impacts of two Green Infrastructure projects in Aurora, IL.

Wenfu Mao.



Charley Nye. Things are humming along at the Bee Research Facility. With a record cold winter and the introduction of the phrase "polar vortex" into our vocabulary, there were some pretty hard losses to our colony numbers after the winter of 2014. It was a difficult lesson to learn, but a good reminder that over-preparation is usually better than under-planning.

One of the biggest changes I've seen since starting here at the Bee Research Facility is the advances in technology used in experiments over the years. One of the most exciting aspects of this is the RFID tagging of individual bees. Tagging the bees and being able to watch their behavior over days or weeks can really provide some amazing data about how the hive is functioning. Having been around for the days when bees were tagged with colored number tags, and graduate students would have to try to avoid heat stroke while recording activity, it makes me excited to see these small advances.

Joy and I were married last Fall in the woods outside of Bloomington, Indiana. We had a lovely wedding and have enjoyed our first year of marriage together. We spent our honeymoon traveling around Thailand and still talk about the amazing food. When we can't make it to Thailand, we still enjoy weekend hikes at Kickapoo, Homer Lake, and down to Shawnee or Hoosier National Forests.



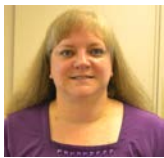
Adrian Smith. I am entering my fourth year as a post-doc in the department. My research here at Illinois has led to some fun insights into the behavior and chemical communication of trap-jaw ants. I have also been active in science communication through a biology podcast that I started called *Age of Discovery* and making various YouTube video of trap-jaw ants. You can find out more about research and my outreach at my website: www.adrianalansmith.com.

Weilin Sun.

Kim Walden.

Staff

Todd Fulton. Greetings! Who knew that 26 years ago when I accepted the part-time Insectary job, that I would still be doing it. I continue to enjoy the job although in the past I've thought about letting the job go, I just can't "walk away". Many times my children "visited with the bugs" while I worked, and now my grandchildren on occasion have come for a visit. I still maintain my RN professional license; however, I have "retired" from full time work in the medical field.



Kim Leigh. Hi. In the summer of 2014, I was promoted to Office Manager for the Entomology Department. Because I had been working in the same office (and even at the same desk) for the past 2 years, the transition has been easier than when I first started working here; however, I still have a lot to learn and I thank everyone for their patience while doing that. People often ask me how I like working in an office that's all about bugs (I even get some crawling across my desk sometimes!), and I answer that I couldn't have asked for a better group of faculty, staff, or students to work for and with! You all really are wonderful and you are the reason that I love to come to work every day. Thank you!

Entomological Society of America Mixer 2013



Subject: ESA sketch
 From: Rob Mitchell <rmitchell@email.arizona.edu>
 Date: 11/17/13 9:14 PM
 To: May Berenbaum <maybe@illinois.edu>

Hi May - attached is the sketch from Austin that I had posted on my facebook page. I have a higher resolution (and much larger file size) if you need it.

Legend, from left to right:

Fred Larabee/Todd Johnson (they both had a beard and glasses, and were standing near each other - I think the artist added them as a single person!)
 Kris Farrell Mcintire (undergrad at Illinois State with Steve Juliano)
 Rob Mitchell
 Arthur Ryzak (friend of Pete's)
 Matt Paschen (PhD student at Purdue with Matt Ginzel)
 Nick Seiter (student at Clemson)
 Pete Reangel
 Alan Yanahan
 Linnea Meier
 Matt Ginzel

And, if you didn't see it already, the artist's name appears to be Art Randle (according to helpful comments on my facebook feed).

Rob



From Rob Mitchell (PhD, 2012)—a sketch of Illi-Ents at the 2013 Entomological Society of America meeting...

Arthropod Genomics 2014

Gene Robinson and Hugh Robertson co-organized the 8th Arthropod Genomics Symposium in Urbana in June 2014, with assistance from May Berenbaum, Stewart Berlocher, Allison Hansen, Barry Pittendrigh, and Saurabh Sinha. This meeting was started by Susan Brown at Kansas State University, and now rotates among them, Notre Dame, and us. The two-day meeting was preceded by an afternoon workshop on epigenomics. We had speakers from all continents, with a format of two invited and two contributed talks per session for six sessions, as well as tens of posters. Highlights included a keynote address by Patricia Wittkopp from the University of Michigan on the evolution of gene regulation in *Drosophila* species, updates on the major arthropod sequencing efforts at the BGI in Shanzhen and the Human Genome Sequencing Center at Baylor College of Medicine, and talks about individual arthropod genomes or analyses derived from them by speakers from around the world. We also added a new session on one of the hot topics of the decade, microbiomes, organized by one of our new assistant professors, Allison Hansen, which ended the conference with a talk by her postdoc advisor Nancy Moran, now at the University of Texas in Austin. A special highlight of the conference was a retrospective dinner talk by our own Judy Willis, now at University of Georgia at Athens, which was a special treat for all of those who have enjoyed and appreciated Judy over the 50 years of her research, as well as the students attending. We added a new feature to the meeting with special "themed" tours of campus on the Friday evening before dinner, and these are pictures of two of these tour groups. The next meeting will be back in Kansas June 2015, and then probably jointly with the International Congress of Entomology in Orlando in 2016, before rotating back to Notre Dame and eventually us again in 2018.



Above: Art tour, Below: History tour
Right: Gene Robinson introduces Judy Willis



International Society of Chemical Ecology 2014



ISCE-CSIV 2014
INTERNATIONAL SOCIETY OF CHEMICAL ECOLOGY
CHEMICAL SIGNALS IN VERTEBRATES
Urbana-Champaign, Illinois
July 8-12, 2014



Summary of the meeting by the host May Berenbaum

The 2014 meeting of the International Society of Chemical Ecology was held on the campus of the University of Illinois at Urbana-Champaign. The 2014 meeting of the International Society of Chemical Ecology was the 30th annual meeting of the society, the first held in the United States since the 2008 meeting at Pennsylvania State University and the first held jointly with Chemical Signals in Vertebrates group, which held its 13th triennial meeting. That these two groups have never before held co-located meetings is a bit surprising given that they share a lengthy common history. The idea for founding an international society of chemical ecology was proposed at the first Gordon Conference on Plant-Herbivore Interactions, held in 1980 in Santa Barbara, California, co-organized by Paul Feeny of Cornell University and Gerald Rosenthal of University of Kentucky. After the second Gordon Conference on Plant-Herbivore Interactions, in 1983, the Executive Committee convened a meeting to plan the first meeting of the new Society in Austin, TX for 1984. At that meeting, vertebrates featured prominently; among the 130 participants at the first meeting was Dietland Müller-Schwarze, a founding member of CSiV. The 30th anniversary of the first ISCE meeting also happily coincided with the 40th anniversary of the founding of the *Journal of Chemical Ecology*, providing considerable cause for celebration as well as reflection on the remarkable progress of the field over the course of three generations of chemical ecology research.



Attendees at the four-day meeting numbered over 330, representing 33 countries around the world and 31 states within the United States. Of the attendees, there were 74 students, including at least one student who was still in high school (and who was flattered and more than a little amused to be offered a graduate assistantship by an enthusiastic attendee after his talk). Approximately one-third of the attendees went home with a meeting t-shirt featuring the mythical elemoth, a chimeric creature symbolizing the fact that (Z)-7-dodecenyl acetate is a component of the sex pheromones of over 140 species of moths and of the urinary preovulatory female-to-male pheromone of the Asian elephant (Rasmussen et al. 1997). Approximately 20 attendees participated in the RNASeq workshop offered before the meeting through the UIUC Institute for Genomic Biology; 41 took advantage of UIUC-sponsored stop at the Field Museum in Chicago for a behind-the-scenes tour en route to Urbana.

The historic Illini Union was the official home of the meeting, with plenaries and symposia taking place throughout the building. Many attendees were housed there as well (with many

others staying a few blocks away at the Illinois Student Residence Hall or the Hampton Inn). Highlights of the program included the award talks: the Silver Medal lecture, "Travels with my ant: from macrolides to methyl branches, presented by Jocelyn Millar, University of California, Riverside; the Silverstein-Simeone lecture, "Olfactory-based resource location and danger avoidance in *Drosophila*," by Bill Hansson, Max Planck Institute for Chemical Ecology; and ISCE's first Early Career Award Lecture, "Elevation gradients as optimal tools for studying variation in plant defense traits against herbivores," by Sergio Rasmann, University of California, Irvine.

Equally well-received were the seven plenary lectures, given by Jerrold Meinwald of Cornell ("Chemical ecology's past, present, and possible future"), Bonnie Bassler of Princeton ("Tiny conspiracies: cell-to-cell communication in bacteria"), Catherine Dulac of Harvard ("Molecular, genomic and neuronal bases of pheromonal signaling in mammals"), Danielle Whittaker of Michigan State ("Silent songs: content and context of avian chemical signals"), Sylvia Anton of Angers University/INRA ("Modulation of insect olfaction: from neurons to behavior"), Murray Isman of University of British Columbia ("Mixtures matter, and other things I've learned about insect-plant chemical interactions") and Robert Raguso of Cornell ("Landscapes of linalool: evolution of a volatile floral signal").

In addition to contributed sessions, formal symposia included:

1. Recent developments and new opportunities in chemical ecology for sustainable food production
2. Protecting crops by exploring and exploiting plant-mediated tritrophic interactions in the rhizosphere
3. Evolutionary ecology of chemically mediated interactions
4. The role of bacteria in vertebrate chemical signaling: the scents of symbiosis
5. Quorum sensing and biofilms
6. Insect communication through cuticular chemicals
7. Fungal superhighways: common mycorrhizal networks mediating plant communication
8. Chemical ecology of insect herbivore genomes
9. Chemical cues and signals structure marine populations, communities, and ecosystems
10. The use/application of semiochemicals to manage farm, zoo and wild animals
11. Chemical methods
12. Effects of pollution on plant defenses, insect behavior and evolution
13. Chemical ecology and global decline of pollinators

In recognition of the 30th anniversary, representing three generations of chemical ecologists, a roundtable, organized by Monica Hilker and Julia Kubanek and populated with representatives from all three generations, discussed ISCE achievements, future perspectives, and plans for promoting the field of chemical ecology and the careers of chemical ecologists.

Social activities new to ISCE included a Pheromone Fear Film Festival, attended by about one-third of the people at the meeting, although that number dropped appreciably throughout the evening, possibly due to the less-than-Oscar-worthy nature of the feature film "Empire of the Ants" and possibly due to the "glacial" temperature of the room in Noyes Hall where the movies were shown. Cold temperatures notwithstanding, the audience sing-along to Darren Criss's song Pheromones was enthusiastic (to try it yourself, click on

<https://www.youtube.com/watch?v=WcxLMPBY2k>).



Colloquium Speakers

Spring 2014

27 January	Sam Beshers UIUC	"The theory of division of labor in social insects"
3 February	Timothy Linksvayer University of Pennsylvania	"The extended genotype of social insect caste"
10 February	Nicholas Barber Northern Illinois University	"Ecological interactions between above and below ground organisms through shared host plants"
17 February	Zakee Sabree Ohio State University	"Insect-microbe symbioses and the consequences of intimacy"
24 February	Juma Muturi State Natural History Survey, University of Illinois	"Environmental regulation of mosquito-borne arboviruses: Larval environment makes the adult vector"
3 March	Paul Marek Virginia Tech	"Phylogenetic systematics and the evolution of bioluminescence in cyanide-producing millipedes" CANCELLED
10 March	Sean Schoville University of Wisconsin, Madison	"Evolutionary responses to climate variation, with a focus on alpine insects"
17 March	Charles Mbogo Center for Geographic Medicine, KEMRI/Wellcome Trust, Kilifi, Kenya	"The changing epidemiology of vector borne diseases in Africa - The case for malaria"
24 March	Spring Break	
31 March	Dan Herts Ohio State University	"The emerald ash borer invasion of North America: Ecological impacts and the quest for resistance"
7 April	Steve Reppert University of Massachusetts Medical School, Worcester	"Navigational mechanisms of migrating monarch butterflies"
14 April	Tania Jogesh Exit Seminar	"Consequences of global redistribution on the ecology and evolution of the invasive weed <i>Pastinaca sativa</i> "
21 April	Ben Sudd Illinois State University	"Environment induced change to immunity and infection in bumblebees"
28 April	Steven Frank North Carolina State University	"Can forests take the heat? Managing pests and ecosystem services in a warming climate"
5 May	Paul Marek Virginia Tech	"Phylogenetic systematics and the evolution of bioluminescence in cyanide-producing millipedes"

Fall 2014

25 August	Jorge Zavala University of Buenos Aires	Responses of developing seeds of field-grown soybean to stink bugs damage (<i>Nezara viridula</i>) and its effects on insect preference
1 September	Labor Day	
8 September	Jeff Bara UIUC, Muturi lab postdoc	Environmental factors regulating the transmission of mosquito-borne diseases
15 September	Nick Miller University of Nebraska	Population genetics of oom rootworms
22 September	Thomas Miller University of CA, Riverside	Painting fences and building gates
29 September	Jim Miller American Museum of Natural History, New York	Monographic Research in Lepidoptera
6 October	Mami Randrianaandrasana Grad Student Exit Seminar	<i>Antheina surika</i> (Saturiniidae), using its natural history for conservation in Madagascar
13 October	Ian Kaplan Purdue University	Attracting carnivorous insects with plant volatiles: The future of playing with fire?
20 October	Micky Eubanks Texas A&M	Herbivore-plant mutualisms? Aphids can directly benefit their host plants via induced defenses and apparent competition
27 October	Nora Pinter-Wollman University of California, San Diego	Individual variation in collective behavior
3 November	Chris Buddle McGill University	From beetles to black flies: the biodiversity and community structure of Arctic arthropods
10 November	ESA practice talks	
17 November	ESA's 62nd Annual Meeting Portland, Oregon	
24 November	Thanksgiving Break	
1 December	Chris Jeffrey University of Nevada	Understanding biodiversity through chemical exploration
8 December	Hagai Shpigler UIUC, Robinson lab postdoc	The influence of juvenile hormone on the reproduction, division of labor and brain gene expression in bumblebee (<i>Bombus terrestris</i>) workers

Spring 2013

28 January	Hongmei Li-Byarlay University of Illinois	<i>Epigenomics and Social Behavior in Insects</i>
4 February	No Seminar Scheduled	
11 February	Matthew Yoder Illinois Natural History Survey	<i>The Divergences and Destiny of Digital Taxonomy</i>
18 February	No Seminar Scheduled	
25 February	Barrett Klein University of Wisconsin	<i>SLEEPING IN A SOCIETY: bees, brains, and the question of sleep in the context of a colony</i>
4 March	Samuel Beshers University of Illinois	<i>The Theory of Division of Labor in Social Insects</i>
11 March	Jean Tsao Michigan State University	<i>Elucidating the ecological factors responsible for low incidence of Lyme disease in the southeastern US: preliminary results provide support for several hypotheses</i>
18 March	Spring Break	
25 March	Julie Allen Illinois Natural History Survey	<i>Partners in Time: Ecology and Evolution of Coevolving Organisms</i>
1 April	Scott Shreve , Exit Seminar University of Illinois	<i>Restricted sexuality and evolution of reproductive mode in Psocoptera</i>
8 April	Shelley Adamo Dalhousie University	<i>The voice from within: parasitic manipulation of host behaviour.</i>
15 April	Miguel Corona USDA Bee Laboratory	<i>Nutritional regulation of division of labor and honey bee health</i>
22 April	Locke Rowe University of Toronto	<i>Patterns and process of sexual conflict in water striders</i>
29 April	Stewart Berlocher University of Illinois	<i>Sympatric speciation in <i>Rhagoletis pomonella</i>: where we have been and where we are going</i>

Fall 2013

16 September	Richard Brenner ATIP, Foundation	"Career transitions of an Illini entomologist: from applied science to the shaping of federal policy and future public-private partnerships"
23 September	Richard Musser Western Illinois University	"Investigating the interactions of plant-herbivore interactions"
30 September	John Rogers UIUC, Dept. of Materials Science and Engineering	"Digital cameras with designs inspired by the arthropod eye"
7 October	Lynn Adler University of Massachusetts, Amherst	"Sex and drugs: the ecology and evolution of floral interactions"
14 October	Sarah Hamer Texas A & M	"Chagas disease eco-epidemiology in the southern US: applying a 'One Health' approach to a neglected vector-borne parasite of humans and dogs"
21 October	Steven Frank North Carolina State University	"Can forests take the heat? Managing pests and ecosystem services in a warming climate"
28 October	Catherine Loudon University of California, Irvine	"Capture of bed bugs by bean leaves: the physical interface between plant and insect"
4 November	ESA Practice Talks	
11 November	No Seminar Scheduled	
18 November	Ehab Abouheif McGill University	"Evidence for a developmental organizer of the superorganism in ants"
25 November	Thanksgiving Break	
2 December	Andrew Mackay University of Illinois at U-C	"Influence of stormwater management practices on the ecology of <i>Culex</i> spp. mosquitoes and West Nile Virus transmission risk"
9 December	Julia Allen University of Illinois at U-C	"Partners in Time: Ecology and Evolution of Coevolving Organisms"

Fall Picnic 2013



Fall Picnic 2014



GRADUATE STUDENTS



Rafael Achury Morales. I am a PhD student working in the Suarez lab and currently I am starting my fourth semester in this department. After finishing my master's and my undergrad at Universidad del Valle (Cali – Colombia), I applied for a Fulbright fellowship and it allowed me to be at UIUC. My adaptation to the new environment and country was kind of easy due to the fact that people in my lab and the department are very kind, and regardless of the English, everything is getting better day by day. My broad interest is the ecological causes and consequences of biological invasion. I have been working during the last years on the little fire ant (*Wasmannia auropunctata*) in tropical dry forest in Colombia. The next step in this doctoral path is to try to understand how invasions and fragmentation interact in tropical countries to influence diversity. Finally, despite how amazingly flat the Midwest is, in this beautiful town I have found great friends, food, beer, insects and salsa music to enjoy every day!!! Un abrazote para todos ;)



Eline Ampt. I'm a first-year master's student at Wageningen University (The Netherlands) and on exchange in Illinois for the spring semester! Quite some years ago I decided to study Biology in Wageningen because of their great Entomology department, and for the same reason I've chosen UIUC as an exchange destination. I'm doing a research project in the Berenbaum lab on the navel orangeworm and am also taking some entomology-related courses. My research here will focus on navel orangeworm larval behavior. This will involve testing whether they're attracted to *Aspergillus flavus* and possibly comparing diet preference of different navel orangeworm lab strains.



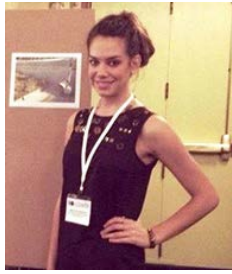
Nick Anderson. I am a first-year master's student studying native ground-nesting bees in prairie restoration with Dr. Alex Harmon-Threatt. I'm particularly interested in the potential soil legacy effects of pesticides used on converted row crop fields. As an undergrad, I worked in a variety of systems including stream biogeochemistry, snail-crayfish interactions, grasshopper-mite interactions, and Great Salt Lake bioherm growth. I received my Bachelor of Science from the University of Notre Dame in South Bend, Indiana.



Chip Austin. I have been spending my master's program working with Chris Dietrich on his Tree of Life project concerning the Paraneoptera. My contribution to this endeavor is going to include a morphological phylogeny of representative Hemiptera with special attention paid to the structure of the ovipositor. As of January 2015 I have begun incorporating microCT scanning and reconstruction into my analysis, and I am very excited to explore the potential use of this technology in classical morphology and systematics!



Nathalie Baena. I am a PhD student in the Sam Heads Lab. I am studying the family Ripipterygidae, also known as mud crickets, and my research is focused on the phylogenetic relationships of this group. This is my second year as a graduate student at UIUC; during the first year, I have done some graduate research identifying Kyrgyzstan orthopterans and engaged in public education and outreach events. I also visited the Museum of Zoology at the University of Michigan, where I studied specimens of mud crickets.



Brittany Buckles. I am interested in the concepts of sustainability and entomology, especially melittology. I have previously investigated the colonization of green infrastructure by cavity-nesting bees and wasps in urban and rural locations. My master's project will investigate wild bee emergence rates under different restoration techniques administered by the Missouri Department of Conservation. I am interested in habitat characteristics of native ground nesting bees, such as temperature, compactness, bulk density, and pH levels of soil.



(Photo of *Megachile latimanus* taken by Brittany under a microscope.)



Daniel Bush. I am a second-year graduate student in Dr. May Berenbaum's lab. I received my B.S. in biology from the University of Missouri—St. Louis in 2013, and my undergraduate research concerned arthropod biodiversity in Missouri oak-hickory forest. My current research centers on the relationship between the navel orangeworm (*Amyelois transitella*) and the toxigenic mold *Aspergillus flavus*. These two species comprise the most economically important pest complex in California tree nut and fruit orchards. Navel orangeworm causes mechanical damage and spoils nuts with frass and webbing. It also vectors *A. flavus*, which produces aflatoxins, the most powerful known naturally-produced carcinogens. Thus far, I have demonstrated that each species grows more quickly in the presence of the other and that *A. flavus* ameliorates the detrimental effects of furanocoumarins (toxic phytochemicals present

in some hosts of *A. transitella*) on navel orangeworm survival. These results were presented as a poster at the 2014 Entomological Society of America meeting in Portland, and the poster won the President's Award for its section. I hope to finish my master's thesis this year and continue working on insect-plant-fungus tritrophic interactions.



Scott Cinel. I joined the Department of Entomology this past Fall as a master's student with intentions of continuing on to earn my PhD as well. After completing several projects on vertebrate and plant ecology during my undergraduate career at UIUC, I realized that insects simultaneously fascinated me and offered ample, practical opportunities for studying many of the ecological theories I had come to understand during my education. I now plan to use a unique entomological perspective to study patterns of predator-prey interactions on a landscape scale in a tightly co-evolved insectivorous bat-nocturnal butterfly system in the

Neotropics while partnering with the Smithsonian Tropical Research Institute. The Entomology Department's support and generosity has been vital to fostering my research and I am grateful to all members of the department, both past and present, who have developed such an astounding and fruitful place to complete my graduate education. Best wishes to everyone in the upcoming year and I can't wait to update you all on my progress in the future.



Catherine Dana. This semester I'm working towards writing and publishing my master's work on behavioral responses of honey bees to neonicotinoid insecticides. I'm also writing up a chapter on a Berenbaum lab favorite -- the navel orangeworm -- and how it detoxifies neonicotinoids and spinosyns. This year, along with Sam Heads, Mike Jeffords, Sue Post, and Joe Spencer, I will be starting work on a project funded by the Department of Natural Resources on using insects as indicator species in Illinois prairies and savannahs. I am planning to use this opportunity to explore the interface between agriculture and natural systems -- and what better place to do that than Illinois!

With the little free time that I have, I like to garden, do outreach in local schools, bake, and care for the eight mighty (not mite-y) ducks who are faithfully laying eggs daily through this cold winter.



Charles Dean. Hello! My name is Charles Dean. I am a second-year master's student in the lab of Sydney Cameron. I am interested in color pattern formation in bumble bees. To that end, I apply aspects of physiology and ecology to elucidate the biological mechanisms underlying the development of banding patterns. The goal of my current project is to determine whether brood nest temperatures affect color patterns. I would ultimately like to study the genetics of color pattern formation, as the genes involved in this process presently remain unknown. I have also participated in research regarding infection by the fungal pathogen *Nosema bombi* and detailing aspects of *Bombus auricomus* biology, as this species is relatively absent in published literature.



Mark Demkovich. I am a first-year PhD student in the lab of Dr. May Berenbaum. My current research focuses on insecticide detoxification in the navel orangeworm (*Amyelois transitella*), the primary pest of almonds and pistachios in California orchards. I am working with a recently wild-caught population of navel orangeworm in Kern County, CA that has become resistant to pyrethroid insecticides as a result of elevated expression of cytochrome P450 monooxygenase and esterase genes. I am interested in determining the full detoxicative capabilities of this population toward all registered chemical classes used in orchards and identifying the specific genes that confer pyrethroid resistance.



Michelle Duennes. 2015 marks the last year of my graduate career as I finish my dissertation this year! For my dissertation I have studied the phylogeography and population genetics of a widespread montane bumble bee (*Bombus*) species complex in Mesoamerica. My research has sent me to several Mesoamerican countries for field work and I have served as a science advisor for the Mesoamerican section of the International Union for the Conservation of Nature (IUCN) Bumble Bee Specialist Group. I have also studied color pattern development in *Bombus* by characterizing the phenotype of nearly every currently recognized species to look for common pattern elements that exist across the genus. I am in my third year as an Achievement Rewards for College Scientists (ARCS) Scholar. Outside of academia, I'm in my fifth season of playing roller derby with the Twin City Derby Girls as skater Polly Nator. Polly Nator also made several appearances during our celebration of National Pollinator Week, as I have been the event coordinator for the past five years.



Allison Gardner. I am a third-year PhD student from Bedford, New York, working with Juma Muturi and Brian Allan. I received my BA from Williams College and MS degrees in Pathobiology and Applied Statistics from the University of Illinois. My research in medical entomology examines the effects of displacement of native terrestrial plants by invasive species on habitat attractiveness and quality for mosquitoes, and explores avenues to apply these results for environmentally safe and sustainable strategies to reduce risk of exposure to mosquito-borne pathogens. My single most grueling experience in five years at the U of I has been playing alto saxophone at Homecoming with Gary Smith and the alumni marching band.



Patrick Gero. I'm Patrick Gero, a second-year master's student in Entomology in Kevin Johnson's lab. I am working on my master's thesis on the relatively undescribed *Kilauella* bark louse genus of Hawaii. These lice are endemic to the Hawaiian Islands and serve as an interesting system for studying evolutionary processes. This island chain, being so far isolated from any mainland, also serves as an interesting analog to host-parasite systems. I plan on using the date of each island's uplift to study the spread and timing of diversification across the islands.



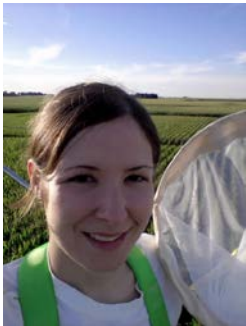
Josh Gibson. I am a first-year master's student in Andy Suarez's lab studying the evolution of trap-jaw mechanisms in ants. This mechanism has evolved independently at least five times in ants and is an astounding example of convergent evolution. Currently I am preparing to collect preliminary data on the development of trap-jaw mandibles in *Odontomachus* as part of my master's thesis, in addition to working on a number of exciting side-projects. I have only been in Urbana-Champaign for a little over five months, but already feel at home in this department. More updates to come next newsletter. I'm sure you'll all hardly be able to contain your ANT-icipation of seeing where my research ends up.



Sarah Giers. This past year has been productive with a publication from my undergraduate research and another for my assistance on the *Musca domestica* genome annotation project. I also did some annotation work for the Medfly genome project, and I got further along in my own research on *Rhagoletis pomonella* odor receptors, though I've had a decent struggle with getting the genes to clone nicely. I'm looking forward to finishing up and getting on to writing, however, and the new year is looking promising. I also took on the role of outreach coordinator in EGSA, and it has been a blast getting to share my passion for science and arthropods with the public.



Tyler Hedlund. I am a second-year master's student in Brian Allan's lab, focusing on the spread of the black-legged tick (*Ixodes scapularis*) and Lyme disease (caused by *Borrelia burgdorferi*) in the Chicago, IL metropolitan area. On a separate (but equally ticky!) research note, I am working on creating a new photographic key of Kenyan ticks by identifying and photographing relevant morphological features of the ticks that Dr. Allan has brought back with him from Kenya. During the summer of 2014, I accompanied Dr. Allan to Kenya as an extra set of hands to collect ticks. When not working on ticks, I keep arthropods as pets and currently have ~50 different species.



Sarah Hughson. I am a PhD student studying movement and mating behavior of western corn rootworm (WCR) in Dr. Joseph Spencer's lab. For my master's, I focused on WCR adult emergence and distribution in Bt cornfields. Some of the most important aspects of my research focus on understanding how WCR use refuge and whether they are readily moving between refuge and Bt corn as insect resistance management strategies intend. This summer, our lab turned to the sky, collecting adult WCR as they ascended from Bt cornfields in migratory flight. By evaluating WCR collected from 10 m scaffolding we can learn the characteristics of beetles leaving cornfields and the proportion that originated in our cornfields vs. surrounding fields. My main interests are insect ecology and behavior in agriculture. I hope to continue working on applied entomological topics in my future research.

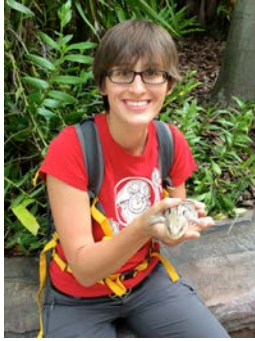


Todd Johnson. I am a second-year PhD student in Lawrence Hanks' lab. I am broadly interested in the behavior of insects, particularly those within forest ecosystems. Woodboring beetles, such as those in the family Cerambycidae, are increasingly intercepted at ports and are threats to our forest resources. A better understanding of the behaviors of these insects, as well as their natural enemies, will allow us to improve the efficiency and efficacy of our management programs. The ultimate goal is to improve protection of our forests, and reduce economic losses.

My research goal at UIUC is to determine the identities of parasitoids of cerambycids, as well as their respective rates of parasitism in central Illinois. An outcome of this work would be a better understanding of the effects of parasitoids on cerambycids, and whether or not they regulate populations. During the summer of 2014, I conducted an experiment to determine if parasitoids were attracted to pheromones of cerambycids. This work was presented at the 2014 Entomological Society of America meeting in Portland, OR, and is ongoing. Additionally, I have a series of small experiments investigating the

host-relationships of cerambycid beetles.

Prior to my arrival in the fall of 2013, I completed my master's in entomology at the University of Wisconsin-Madison, with Kenneth Raffa. As an RA at UW-Madison, I coordinated and conducted the releases of three biological control agents of the emerald ash borer (Coleoptera: *Agrilus planipennis*) in Wisconsin. My master's thesis focused on host-location by two ectoparasitoids of *A. planipennis*, *Spathius agrili* (Hymenoptera: Braconidae), an introduced biocontrol agent, and *Spathius floridanus* (Hymenoptera: Braconidae), a native congeneric. I determined that the two wasps use chemical signals from different parts of green ash to locate a feeding *A. planipennis*. Other research evaluating the biological control releases and assessing non-target effects of biological control agents in Wisconsin are in preparation.

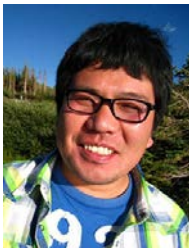


Tanya Josek. I joined the department as a master’s student in August 2013 with Marianne Alleyne as my advisor. My current work is focused on utilizing morphometrics and statistically analyzing the Haller’s organ of the ticks *Ixodes scapularis*, *Dermacentor variabilis*, and *Amblyomma americanum*. I also have a genetics component to my thesis, where I’m looking at specific receptor sequences found in the Haller’s organ of *I. scapularis*. Outside of my research, I have a great interest in outreach and education. I have been working on educational videos as well as helping improve and develop new online courses such as Bioinspiration and Insect Pathology.



Aron Katz. I am a PhD student in the Springtail Lab headed by Dr. Felipe Soto-Adames, and I am president of EGSA. The last 2 years have been very busy, but I have finally managed to complete my master’s and both chapters of my thesis are now in press or in review. My current research is focused on the biodiversity, systematics, and evolution of springtails. This summer I traveled to Panama where I spent 2 months collecting marine springtails to observe the molecular divergence of populations across the Isthmus of Panama in order to investigate their rate of molecular evolution; ultimately an effort to understand the prevalence of cryptic speciation in springtails. Much of my time is spent hunched over a microscope and teaching labs for Applied Entomology and Evolution, but my fiancée and I always manage to find some time to travel new places and experience

different food and cultures. I also enjoy drinking good coffee and beer, my cat Toby, going to movies, and BBQing with my fellow graduate students (if you haven’t already, come by next time for some famous chicken!)



Dohyup Kim. I am really happy to start my PhD program here at the UIUC under the advisement of Dr. Allison Hansen. I finished my master’s degree at the University of Wyoming working on modeling of protein evolution and structure. My background is bioinformatics, and I am completely new to this exciting world of entomology. My research involves epigenomics and insect symbionts, and I am excited to work on these subjects. I’m also particularly interested in music, playing the cello and the bass guitar. I’m currently in a band and a string ensemble with some other undergraduates, but if anyone wants to organize a musical group within the department, I’m all ears!



Fredrick Larabee. My fourth and final departmental newsletter... How bittersweet!
My research interests focus on the evolution and functional morphology of insect mouthparts, and I am in the process of completing my PhD in the lab of Andy Suarez. For my dissertation, I am studying the phylogenetics and biomechanics of trap-jaw ants. In 2013, I was offered a Buck Predoctoral Fellowship to work on my dissertation at the Smithsonian Institution National Museum of Natural History in Washington, DC. It was hard leaving Champaign, but I am so grateful for the amazing opportunity working at the Smithsonian has been. I’m very excited to see what experiences wait for me after graduate school.



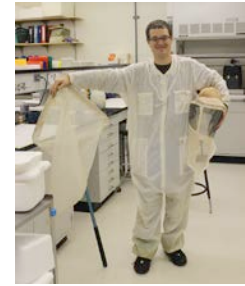
Ling-Hsiu Liao. Hi. I am a PhD candidate in Dr. Berenbaum’s lab interested in detoxification strategies of the western honey bee. My research covers from physiological mechanisms to behavioral strategies of honey bees. I hypothesized that age-related division of labor in colonies affects each individual such that xenobiotics are processed differently depending on caste, age, and task. I also test foraging behavior responses to several xenobiotics. Additionally, with Wen-Yen’s help, we have built a bee flight-testing platform to evaluate the effects of xenobiotics on flying ability of honey bees.



John Maddux. The last time I wrote for a department newsletter it was at the very beginning of my degree. It seems fitting, then, that I write my next (and last) update near the end. As a member of the Cameron Lab, I have spent the two years since the last newsletter studying bumble bee coloration. Specifically, I set out to test the widely accepted, but largely untested, hypothesis that bumble bees form convergent color-pattern groups under selective pressure from predatory birds.

Over the course of the next few weeks I will be screening bird dietary samples collected by 25 collaborating bird banders this past year for evidence of bumble bee predation in the wild. In addition, I am using objectively measured reflectance data and avian vision models to determine whether birds see the same similarities in color pattern among bumble bee species that humans do.

This will be my last semester at Illinois. In May I will graduate and move to Missouri with my wife, Whitney, and 15-month-old son, Jack, to begin my career in high school science education. I cannot convey how truly supportive my lab and our department have been over the past few years. I will always be grateful to have been a part of both.



Linnea Meier. I received my B.A. at Earlham College, a small liberal arts school in Indiana. I majored in biology and developed an interest in invertebrates, especially insects. After graduating in 2009, I spent a couple of years out of school, working and starting a family. I now live in Urbana with my husband and 5-year-old daughter, juggling graduate school and family life. I got my MS in December 2014 in the Hanks lab, and am continuing on for a PhD there.

My research is in the chemical ecology of longhorned beetles (family Cerambycidae). Cerambycids are a large and diverse group of wood-boring beetles which include numerous current and potential forest and timber pests. Because their larvae live and feed in the wood of trees, they are difficult to monitor visually. However, their behavior is very reliant on chemical cues, including aggregation pheromones and sex pheromones. Pheromone components are often highly conserved within taxonomic subgroups, and the focus of my research is to understand the chemical mechanisms that are used to avoid cross-attraction between sympatric, synchronous species with very similar pheromones.



Brendan Morris. Graduate student under Dr. Chris Dietrich at Illinois Natural History Survey currently studying the systematics and taxonomy of Caribbean treehoppers (Homoptera: Membracidae). In August 2013, I slept-walked off a building in Brooklyn, NY, and returned to the department in September after a year of recovery and figuring out how to kick around a prosthetic leg (still learning). My interests outside of the world of treehoppers are generally naturalistic, ranging from aquarium and terrarium husbandry to creating treehopper inspired art and fashion. During warmer months I can usually be found swinging a sweep net or scouring tree branches for bugs.



Nicholas Naeger. I am in the last year of my PhD working in the lab of Dr. Gene Robinson, where I have studied honey bees.



Allison Parker. I am a second-year student co-advised by Brian Allan and Juma Muturi. I graduated from the University of Richmond in 2010. I taught high school science in Dallas, TX for three years before deciding to return to graduate school. I am interested in studying how larval stressors affect disease transmission in adult mosquitoes. In my free time, I enjoy hanging out with my hedgehog, Penelope, and training for triathlons.



Kyle Parks. I am a PhD student in Dr. Jim Whitfield's lab. I have spent the past few years exploring the systematics of *Parapanteles*, a genus of microgastrine wasps, using traditional molecular genetics techniques. It turns out this genus is a bit more complicated than I thought, and needs some taxonomic attention! Now that I have an idea of who is actually related to whom in this genus, I plan on exploring host association and how it influences speciation in this group, especially among *Parapanteles* that attack a specific group of well-studied geometrids, *Eois* moths.



Thomas Schmeelk. I am a second-year master's student in Dr. Larry Hanks' lab. I received my bachelor's degree from SUNY Oneonta in 2012 and took a year off to work. I came to the U of I in August of 2013 and have enjoyed making new friends and seeing what Illinois has to offer. I'm currently studying the species composition of longhorned beetles within the oak-hickory forests of east central Illinois and how they are stratified vertically in the forest. I ran my experiment this past summer and had a lot of fun with it. I'm looking forward to this next semester and what it may bring. I hope to get more involved in outreach as well as finish writing my thesis. My interests include forestry, woodworking, agriculture, hiking and cooking.



Keon Mook Seong. I am a third-year PhD student in the Pittendrigh lab working on the discoveries of novel candidate genes associated with xenobiotic resistance for *Drosophila*. I am also eager to understand how DDT impacts biological systems of *Drosophila*. It could help figure out the development of novel control methods for resistant species. I look forward to a few more exciting years at UIUC!



Eric South. After the completion of two music degrees and a 20-year career as a woodwind performer, I returned to formal education to pursue my first passion, fauna of lotic systems. I completed my Bachelor of Science degree in 2012 and began study of aquatic insects in 2013 under the direction of R. Edward DeWalt at the Illinois Natural History Survey. As a second-year master's degree student, I am currently working on the focus of my thesis—the effect of conservation lands on the mayfly, stonefly, and caddisfly communities of the Kaskaskia River watershed. My subsequent plan is a study of Perlidae stonefly systematics through the UIUC PhD program.



Laura Steele. I am continuing to work toward my PhD in Dr. Barry Pittendrigh's laboratory. I am working with *Drosophila melanogaster*, continuing to examine both mechanisms of DDT resistance as well as metabolic effects of methamphetamine. I am also involved with Scientific Animations Without Borders (SAWBO), an extension program based in the lab, and have been working on script development for future animations. This past summer I moved from Champaign to Urbana and enjoy living closer to campus. I spend most of my free time hanging out with my two rescue dogs, Luna and Tris, reading, and keeping in touch with family.



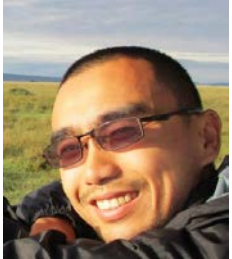
Daniel Swanson. I am a second-year graduate student, co-advised by Steve Taylor and Sam Heads of the Illinois Natural History Survey. My research interests focus on systematics in the Heteroptera, especially the assassin bugs (family Reduviidae), and my master's thesis deals with the description and implications of an assassin bug fossil from the Eocene with remarkably preserved external and internal genitalia. I intend to continue as a doctoral student studying the systematics of the extant members of the group. Since matriculating at UIUC, I have spent time in Illinoisan and Belizean caves, courtesy of projects in the Taylor lab, and co-authored a major revisionary study of a group of short-winged arid-land katydids in North America. On the rare occasion where I am not pursuing something entomological, Christina and I enjoy playing board games and managing our beagle puppy, Lilly.



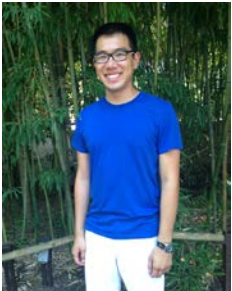
Margaret Thairu. I am a first-year graduate student in Dr. Allison Hansen's lab. I completed my undergraduate work at Florida State University and my MS at the University of Wisconsin - Madison. For my PhD I will be broadly working on microbe-insect interactions.



Erin Allman Updyke. I am a second-year PhD student in Brian Allan's lab. I am interested broadly in the study of vector-borne diseases, and integrating the understanding of ecological aspects of disease transmission with epidemiological investigations. I had the opportunity through the IGERT program last year to begin a research project in Panama and plan on continuing my work there in the upcoming years. My dissertation research will focus on the eco-epidemiology of Chagas disease, transmitted by triatomine "kissing bugs", across a land-use gradient in Panama.



Joseph Wong. I am a fourth-year PhD student in the Hanks' lab. I obtained my master's in the fall of 2011 at UIUC. I have an interest in forest insect ecology, with a current focus on the chemical ecology of cerambycids. My research currently includes evaluation of cerambycid host range, the role of plant volatiles in host location by cerambycids, and improvements to current trapping/research methods. I enjoy playing games, sports, and with my cats in my free time.



Michael Wong. I am currently a first-year MS student in May Berenbaum's lab. My current research interest focuses on honey bee drone behavior and nutrition, although I am also interested in social insect biology in general. I received my BA in Biology from University of Pennsylvania where I researched behavioral network interactions of pharaoh ants during caste determination. I am looking forward to developing my skills as a researcher here at Illinois!



Luke Zehr. I am a first-year graduate student in the Berenbaum lab. I am broadly interested in the chemical ecology of herbivorous insects and the plants they eat. I also am fascinated with the biodiversity in the Neotropics, and hope to be able to do much of my fieldwork there. Support from an NSF IGERT fellowship at Illinois that partners with the Smithsonian Tropical Research Institute in Panama has allowed me to begin work in the tropics already in my first year. While in Panama at STRI, I plan to study nocturnal herbivores on *Psychotria* plants.

Recent Graduates

Graduation Term	Student	Degree	Thesis Title
May 2012	Lauren Kent	PhD	Evolution of the GR family of gustatory and odorant receptors in mosquitoes (H. Robertson)
Dec. 2012	Tara McGill	MS	Expression of tyramine β – hydroxylase and tyrosine hydroxylase genes in response to odor valence in the brain of the honey bee, <i>Apis mellifera</i> (G. Robinson)
May 2013	Jungkoo Kang	PhD	Modeling insect resistance to transgenic corn and cowpea (D. Onstad)
	Sindhu Krishnankutty	PhD	Systematics and biogeography of leafhoppers in Madagascar (C. Dietrich)
	Doris Lagos	PhD	Contribution to the systematics to the genus <i>Aphis</i> (Hemiptera: Aphididae) (D. Voegtlin)
	Aron Katz	MS	A contribution to species delimitation and taxonomy of North American <i>Entomobrya</i> (Collembola: Entomobryidae) (F. Soto-Adames)
Aug. 2013	Scott Shreve	PhD	Evolution of reproductive mode in the scaly-winged bark louse <i>Echmepteryx hageni</i> (K. Johnson)
	Sarah Hughson	MS	Western corn rootworm (Coleoptera: Chrysomelidae: <i>Diabrotica virgifera virgifera</i> LeConte) emergence and abundance in transgenic cornfields with structured and seed blend refuges (J. Spencer)
	Katherine Noble	MS	Xenobiotic detoxification in the navel orangeworm <i>Amyelois transitella</i> (Lepidoptera: Pyralidae) (M. Berenbaum)
	Alan Yanahan	MS	Vegetative communities as indicators of ground beetle (Coleoptera: Carabidae) diversity (S. Taylor)
Dec. 2013	Alice Vossbrinck	MS	Characterization of the transcriptome and the peptidase and the non-peptidase homologs of <i>Callosobruchus maculatus</i> (B. Pittendrigh)
	Andrea Walker	MS	Surveying house-infesting ants after 87 years: Species identity and economic impact in central Illinois (A. Suarez)
May 2014	Tolulope Agunbiade	PhD	A genomic analysis of the insect pest populations of cowpea in West Africa (B. Pittendrigh)
	Tania Jogesh	PhD	Consequences of global redistribution on the ecology and evolution of the invasive weed <i>Pastinaca sativa</i> and its associated insect fauna (M. Berenbaum)
	Marsha Wheeler	PhD	Molecular analyses of endocrine and nutritional factors that affect division of labor and health in honey bees (<i>Apis mellifera</i>) (G. Robinson)
	Mark Demkovich	MS	Insecticide detoxification in the navel orangeworm <i>Amyelois transitella</i> (Lepidoptera: Pyralidae) (M. Berenbaum)
	Christina Silliman	MS	Factors contributing to variation in cuticular hydrocarbon profiles of two species of longhorned beetles (Coleoptera: Cerambycidae) (L. Hanks)
Dec 2014	Diana Arias Penna	PhD	Taxonomy, phylogeny and resource use of <i>Glyptapanteles</i> (Hymenoptera: Braconidae, Microgastrinae), genus highly diversified in the Neotropics (J. Whitfield)
	Maminirina Randrianandrasana	PhD	<i>Antherina suraka</i> (Lepidoptera: Saturniidae): Ecology, systematics, and potential economic uses to promote conservation in Madagascar (M. Berenbaum)
	Andrew Debevec	MS	Revision of <i>Xanthomicrogaster</i> Cameron, 1911 (Hymenoptera: Braconidae: Microgastrinae) (J. Whitfield)
	Linnea Meier	MS	Species-specific blends of shared pheromone components prevent cross attraction among sympatric species of cerambycid beetles (subfamily Lamiinae) (L. Hanks)



Drs. Tania Jogesh and Tolu Agunbiade (May 2014)



Dr. Mami Randrianandrasana with her family (December 2014)

Entomology Graduate Student Association

2014-2015 Officers

President: Aron Katz
Vice-President: Tanya Josek
Secretary: Charles Dean
Treasurer: Margaret Thairu
Outreach Officers: Tyler Hedlund & Sarah Giers
Faculty Liaison: Nick Anderson
GSAC Rep: Michael Wong
Social Chair: Sarah Hughson

This year has been off to a great start. EGSA has enjoyed a few successful night collecting trips by the Salt Fork River, lunch bunches, and the fall camping trip. As always, EGSA has been keeping up with community outreach events by sharing our enthusiasm for insects with children at the Pollinatarium, Mahomet Science Club, Champaign and Urbana Libraries, Booker T. Washington Elementary School, and many others. These events have been very successful and we plan on continuing our entomology outreach efforts. The 32nd Insect Fear Film Festival is just around the corner and we expect the Female Entomologist Fear Film theme to be a hit!

2013-2014 Officers

President: Kyle Parks
Secretary: Todd Johnson
Treasurer: John Maddux
Outreach Officers: Catherine Dana & Tyler Hedlund
Faculty Liaison: Michelle Duennes
GSAC Rep: Sarah Hughson
Social Chair: Andrew Debevec

2013-2014 was a busy and productive year for EGSA. The 31st IFFF: Insecticide Fear was a respectable follow-up to IFFF 30. About 400 people attended the festival, and graduate student participation was extremely high. EGSA also continued its excellent tradition of community outreach, participating in numerous events at the Pollinatarium, the Urbana Farmers Market, the Champaign and Urbana Public Libraries, the Orpheum Children's Science Museum, several local elementary and preschool schools, and many other venues.



2012-2013 Officers

President: Michelle Duennes
Secretary: Andrea Walker
Treasurer: John Maddux
Outreach Officers: Catherine Dana & Brendan Morris
Faculty Liaison: Katherine Noble
GSAC Rep: Linnea Meier
Social Chair: Alice Vossbrinck



CLUB INSECTA

From Thor Hansen, President (2014):

For the past five years, Club Insecta has continued to provide a great environment with lots of opportunities for undergraduate students. It encourages them to get involved with the science of entomology and to learn about insects. Our club also serves as the conduit for all undergraduate entomology students to work together and also includes the opportunity to work with many students from other majors. Majors such as integrative biology, food science, chemistry, and geology among others have all contributed to the club. We frequently try to reach out to fellow students on campus and with the public in general. Our club members will partake in programs such as Insect Outreach Days on campus in the quad and volunteer their time for outreach with different grade schools. Every semester, we have identification meetings to help fellow collectors and students identify and pin all the insects they have collected. Some of the identified insects from these meetings go into expanding our ever-increasing club collection, which is used for our outreach trips. Other activities our club participates in are collecting trips, insect/tarantula-keeping sessions, movie nights, zoo/museum trips, and dinners at various restaurants around Urbana-Champaign. We are always looking forward to new members joining the fun and various club functions throughout the year!



Photos: left, Club Insecta doing outreach on the Quad; right, Club Insecta on a collection trip at the Vermilion River Observatory

30TH ANNUAL INSECT FEAR FILM FESTIVAL Foellinger Auditorium, February 26, 2013



Our 30th festival was without doubt our largest, thanks in no small part to the theme—“The Ins-X Files”, featuring the X-Files movie and one of at least 9 insect-themed television episodes. Turns out there are a lot of X-Files fans out there—crowd size estimates range upward of 2000. Guests came from near and far—a van full drove down from Wisconsin, at least one fan came from Kentucky and others in the audience traveled from Michigan, Ohio, Iowa, and Missouri. The official fansite XFilesNews.com sent a representative to live-tweet. Festival stalwarts Nathan Schiff (PhD 1988) and Ellen Green (MS 1995, PhD 2000) of course drove from Stoneville, Mississippi with representative Cornell

drawers from Nathan’s spectacular collection. Of course, two very special festival guests also traveled a great distance to attend, about whom more later...

The X-Files was an Emmy-winning television series on Fox Network from 1993 to 2002. The show won critical praise, acquired legions of fans, and generated two feature films (*The X-Files: Fight the Future* in 1998 and *The X-Files: I Want to Believe* in 2008). Both the series and the feature films revolved around two FBI agents, Fox Mulder and Dana Scully, who investigate unsolved cases that may involve paranormal phenomena. It will likely surprise no one that the reason for my interest in the X-Files is that over the life of the franchise insects have figured prominently in multiple story lines. The more than ample entomological content in the franchise is why *X-Files* provided the festival theme. We’ve long tried to have special guests for our “anniversary” festivals: legendary film producer/director/writer Bert I. Gordon came for our 20th festival, and Simon Smith, director of *The Bee Movie* attended our 25th Animated Insect festival. Much to my unspeakable delight and utter amazement, Chris Carter, the creator/writer/producer/director of the X Files series and the films, agreed to come as our guest and honoree.

Chris Carter’s interest in science and science fiction was piqued during his childhood in Bellflower California by his younger brother, now a Professor of Materials Science at MIT, who introduced him to the books of Ursula LeGuin. Growing up the era of the Watergate scandal destroyed his faith in benevolent government and the proliferation of reports of alien abductions along with reruns of *Twilight Zone* and *Kolchak: The Night Stalker* undermined his confidence in Earth exceptionalism. After earning a degree in journalism and writing for a magazine for 13 years, he applied his writing skills to scripts for television films for Walt Disney Studios. Disney youth comedies didn’t leave too many opportunities to explore government cover-ups, extraterrestrial beings and the paranormal so, after moving successively from Disney to NBC to CBS, he was finally positioned to develop the project that ultimately became *The X-Files*. He wrote the pilot in 1992 and from that point on Carter was the creative force behind almost every aspect of the show—casting the leads, designing the opening credits, choosing the location for shooting, and writing more than 70 scripts for the 202 episodes. That the show received 52 Emmy nominations and 16 awards is in no small measure due to his stewardship. The show was a cultural phenomenon—Time Magazine called him a “televisionary”. In October 2012, he received the Outstanding Television Writer award from the Austin Film Festival. I want to believe—that the fact that at least ten episodes (of 202) involve insects might have contributed to its success. In the first season, “Darkness Falls” arose out of his interest in dendrochronology features deadly nocturnal phosphorescent green mites disturbed by logging in old-growth forests. In the second season, “Humbug” includes a sideshow entertainer named The Conundrum, who eats insects, and “F. emasculata” revolves around corpse-infesting maggots that reside in exploding pustules. In the third season, “War of the Coprophages” features a wave of mysterious cockroach-related deaths near an alternative fuel research facility. The fourth season included “Herrenfolk,” about genetically engineered bees that pollinate a possibly alien plant and contain in their stingers a lethal variant of the smallpox virus, and “Zero Sum,” in which the genetically engineered bees with the killer venom make a return appearance. In the fifth season “Folie a Deux” deals with parasitosis that may or may not be delusory and “The Post-Modern Prometheus” chronicles a misguided geneticist who wants to apply to humans his experiments with mutant *Drosophila melanogaster* with legs as mouthparts (probably the first time the word proboscipedia was uttered on primetime television—a homeotic protein gene that when mutated turns labial palps to prothoracic legs). And in the ninth season, “Lord of the Flies,” features more flies that endoparasitically feast on human flesh (especially brains). All of these stories derive at least in part from real aspects of insect biology. Chris Carter could retain his skeptical scientific side by finding his aliens right here on Earth, in the Class Insecta.

Because the festival is only three hours long and *X Files* the movie runs 120 minutes, we could show only one episode. But how to choose? I asked Chris Carter which of the episodes he’d like us to feature, and amazingly

he not only chose “War of the Coprophages”, he invited the writer of the script for the episode, Darin Morgan, to come to the festival, too. This episode, the twelfth of the third season, airing January 6, 1996, was watched by over 16 million viewers. In brief, Agent Mulder has to leave his apartment while it gets fumigated and he ends up in Miller’s Grove, Massachusetts, in the midst of a series of deaths involving cockroaches. He eventually comes to suspect that these cockroaches are not of this earth, despite the reasonable alternative explanations for the deaths offered over the phone by Agent Scully. Investigating the deaths, Mulder encounters and is assisted by an entomologist in town, and the mysteries are solved (maybe). From the script—the scene in which he meets the entomologist:

Cut back to Mulder...He stares at the beautiful woman in front of him.)

BAMBI BERENBAUM: May I ask why you're trespassing on government property?

MULDER: I'm a federal agent.

BAMBI BERENBAUM: So am I.

(Mulder shows her his badge.)

MULDER: Agent Mulder, F.B.I.

(Berenbaum shows him her badge.)

BAMBI BERENBAUM: Doctor Berenbaum, U.S.D.A. Agricultural research service.

MULDER: Doctor Berenbaum, I'm going to have to ask you a few questions.

BAMBI BERENBAUM: For instance?

MULDER: What's a woman like you doing in a place like this?

Darin Morgan is a screenwriter who in 1996 was revered by fans of the X-Files and who had already won an Emmy for the script of the episode “Clyde Bruckman’s Final Repose” (1995) (third season, 7th episode). WOTC was his fourth X-file story/script. He told me that he had consulted some of my books in preparing the script and thus felt “Berenbaum” would be an appropriate name for an entomologist. In response to my question about Dr. Berenbaum's appearance, he replied that he had indeed intended to depict her as a “luscious babe...I needed a rival [for female Agent Scully] and it helps if she's really good-looking.” When I asked him about the inspiration for the story--, “Why cockroaches?”--he replied that “cockroaches have a natural kind of fear factor” and that the place where he was living at the time had cockroaches. In this episode, there are references to such entomological subjects as Ekblom's syndrome, cockroach diversity, the biology of the Asian cockroach and its diurnal habits and anaphylactic allergic responses to cockroaches; Dr. Berenbaum expounds on grooming and acoustical behavior of cockroaches, cockroaches in human ears, and Egyptian worship of scarab beetles and deified dung pats. All of these topics are mentioned in books I've written. Kudos to Darin Morgan for actually conducting research before putting pen to paper and for eschewing scientist stereotypes.

So—in recognition of their success in mining the diversity of Class Insecta for compelling stories, the entomologists of UIUC presented our 2013 Entomology Image award to Chris Carter and Darin Morgan.

Now for the episode, War of the Coprophages. You know the human stars of the X Files—David Ducovny and Gillian Anderson. Cockroach stars include *Periplaneta americana*, *Gromphadorhina portentosa*, and, in the final scene, SPOILER ALERT, *Blaberus giganteus*, the giant cave cockroach. All told, about 300 cockroaches were used in filming the episode (with roach wrangler Debbie Cove). Interestingly, the censors had problems with the script, particularly with the use of the word “crap”, in discussions relating to the material used as the alternative fuel source. They appeared to miss altogether the fact that the name of the Sheriff, Frass, basically means “insect crap.” The censors also had no problem with the fact in the WOTC script Bambi Berenbaum examines the genitalia of a cockroach and exclaims “He’s hung like a club-tailed dragonfly!”

The *X-Files* feature film, which grossed over \$185 million in 1998, was written by Carter with Frank Spotnitz and recounts events in the story arc taking place between Season 5 and Season 6. Key to the story are Africanized honey bees that vector an alien virus in their venom (although the bees themselves get only limited screen time and don’t appear until an hour into the film). But the bees are essential to the plot—they’re the “A transportation system. Transgenic crops. The pollen genetically altered to carry a virus.” It’s a bee sting that leads Scully to be abducted and transported to Antarctica, which in turn leads Mulder to search for her with a vaccine and ultimately to discover SPOILER ALERT an enormous alien spaceship. That bees can vector pathogens was actually first reported here on our campus in 1880 by T. J. Burrill, who showed that bees can carry the bacterium causing fire blight from tree to tree in apple and pear orchards. Today bumble bees are routinely used to vector insect-pathogenic fungi to control whiteflies, thrips and aphids and biotrophic fungal spores to combat gray mold on plants. Why not alien viruses?

All in all, the 30th annual Insect Fear Film Festival was a great success, due not just to the films and the guests but due to the spirit of Bambi Berenbaum—“ Everything about insects is fascinating. They are truly remarkable creatures. So beautiful, and so honest...Eat, sleep... defecate, procreate. That's all they do. That's all we do, but at least insects don't kid themselves that it's anything more than that.”



30th Annual Insect Fear Film Festival. Top: Nathan Schiff shows screenwriter Darin Morgan a club-tailed dragonfly, Scott Robinson with Bugscope, t-shirt sales desk, Nathan Schiff and Ellen Green, Kentucky X-Files fan with “War of the Coprophages” collectible. Middle: Nick Naeger with Chris Carter and Darin Morgan, Tania Jogesh painting faces, crowds at displays, art contest. Bottom: Chris Carter and Darin Morgan, listen, conduct a Q&A, receive their award, and relax with May Berenbaum and Richard Leskosky the next day.



Scenes from the 31st Annual Insect Fear Film Festival (Pesticide Fear Films), 2014.

31st ANNUAL INSECT FEAR FILM FESTIVAL Foellinger Auditorium, February 22, 2014

The 31st Insect Fear Film Festival solidified the status of our IFFF as the longest-running insect film event and oldest college celebration of insects in the United States. This year, we had the usual media attention but we gained a few new fans—for the first time, we were tweeted by Terminix Services and Pestweb Canada by Univar. Again in attendance were Nathan Schiff and Ellen Green. Nathan, by the way, works for the Forest Service—the heroes of our first movie. So, IFFF is 31 years old—but it's not the only IFFF; every year I discover more. Two other IFFFs have an entomological connection: International Federation of Fly Fishers, Livingston, Montana; Institut für Forstentomologie, Forstpathologie und Forstschutz (IFFF) in Vienna, International Fungi and Fibre Federation, Encampment, Wyoming. Speaking of acronyms, how about DDT, known to its friends and fans as dichlorodiphenyltrichloroethane? It was the focus for our festival this year. Here's a chemical banned for use in the US in 1972, >40 years ago, that continues to make headlines. A story appeared January 27, 2014 about a study in *JAMA Neurology* showing patients with Alzheimer's had blood levels of DDE, a metabolite of DDT, four times higher than adults without the condition. Ironically, DDT is the one pesticide everyone else remembers. It won't go away, either literally or figuratively. First synthesized by Viennese chemist Othmar Zeidler in 1874, it sat on shelves until Paul Mueller, a Swiss chemist working for J.R. Geigy, showed that it was extraordinarily effective against an enormous variety of insects (the 350th chemical he tested); moreover, it was dirt-cheap to make and applications seemed to last indefinitely. It was rapidly adopted for use during World War II and was instrumental in heading off the massive epidemics of insect-vectored diseases hitherto an inevitable accompaniment to war (it helped contain a typhus epidemic in Naples, Italy, and reduced casualties from malaria on Guadalcanal from 70% to 5%). Mueller won a Nobel Prize in Physiology or Medicine for his work in 1948. But DDT's virtues were also its problems. 1946--commercially available applied as dust, aerosol, emulsion and wettable powder. Dirt-cheapness meant people used it with reckless abandon. In 1959, the year of peak "domestic disappearance" 35.7 million kg (80 million pounds) were applied in the U.S. By 1972, DDT was famously banned for all uses in the U.S. Its broad-spectrum activity meant there were countless collateral deaths and its environmental persistence meant that it accumulated in food chains, concentrating in tissues (first noticed in robins on the UIUC quad by entomology graduate student Roy Barker).

But it's not just literally in our bloodstream, it's figuratively there too. It's the only pesticide condemned in pop music for destroying the environment; Joni Mitchell wrote "Big Yellow Taxi" in 1970 exhorting "*Hey farmer, farmer, put away your DDT now/ Give me spots on my apples but leave me the birds and the bees, please*", covered by Counting Crows in 2003. DDT is a popular Russian rock band founded in 1980, and in 2004, the hip hop group Jurassic 5 released a rap called "DDT": *Pesticides I'm the double D combine the T/That's DDT/ A chemical more to better to burn/Roaches, germs, mouse, lice, termites and percutaneous bugs/Or try thugs who perpetrate/Nothing within contaminate/Got my gloves on/ So bring turtle doves on/ Watch me pluck em and pick em/ Stick em kick em and vic em/I see you're featherless/You got the birdy disease/Bite any rhymes that I have for ya/ The poison is bad for ya stupid/ You're equal measure to dirt dust grime and puss/You're just a rappin infection/Dirtlizin my section like a six-legga/Ya betta step off and walk ya pure roach.*

DDT remains America's most familiar toxic substance, despite having disappeared from shelves when Nixon was President and J. Edgar Hoover was alive. Like a rap star, it's known just by its initials; it's the Notorious B.I.G. of pesticides, DDT still makes headlines, particularly in the context of whether the potential benefits to be gained by reducing malaria transmission in Africa with the use of DDT outweigh the potential risks to the environment. Why resurrect it for our festival? Every once in a while life imitates art. In April, 2013, Congress authorized H.R. 1526: Restoring Healthy Forests for Healthy Communities Act, mandating salvage logging after forest fires in national forests, even overriding federal environmental laws to do so. Ostensibly to promote rapid recovery of forests, the bill basically contradicts 25 years of forestry research; periodic fires are now known to be a normal part of forest community dynamics and that clearing timber jeopardizes recovery. That's why, on October 30, 2013, 250 scientists (including prominent entomologists) signed an "open letter to members of Congress" voicing their concern about post-fire logging and its adverse ecological effects. Although the scientists didn't say so, it would appear that the clearest, and maybe only, beneficiaries of HR1526 are representatives of the timber and logging industries.

The U.S. lumber industry has long been big business in the U.S.--forest product exports exceeded \$6 billion in 2003, making our country among the world's largest forest product exporters. Timber magnates in fact have a long history of being bad guys in movies. *Riders of the Whistling Pines*, a 1949 feature film starring cowboy legend Gene Autry. Briefly, Henry Mitchell is a lumber magnate suspected of cutting restricted timber; when Forest Ranger Charles Carter discovers a "tussock moth" infestation affecting "60,000 acres" of forest and wants to report it, he is pre-emptively murdered by a lumber company flunky Bill Wright, who frames Gene Autry for the killing. Mitchell wants the infestation to kill trees so his company can salvage the lumber (hissing, "with our exclusive contract with the state we'll have a lot of timber"). Unfortunately for the evildoers, Gene Autry (playing Gene Autry) notices defoliation and the larvae (which he pronounces "lar-vī") and announces that "the only answer is to spray the entire

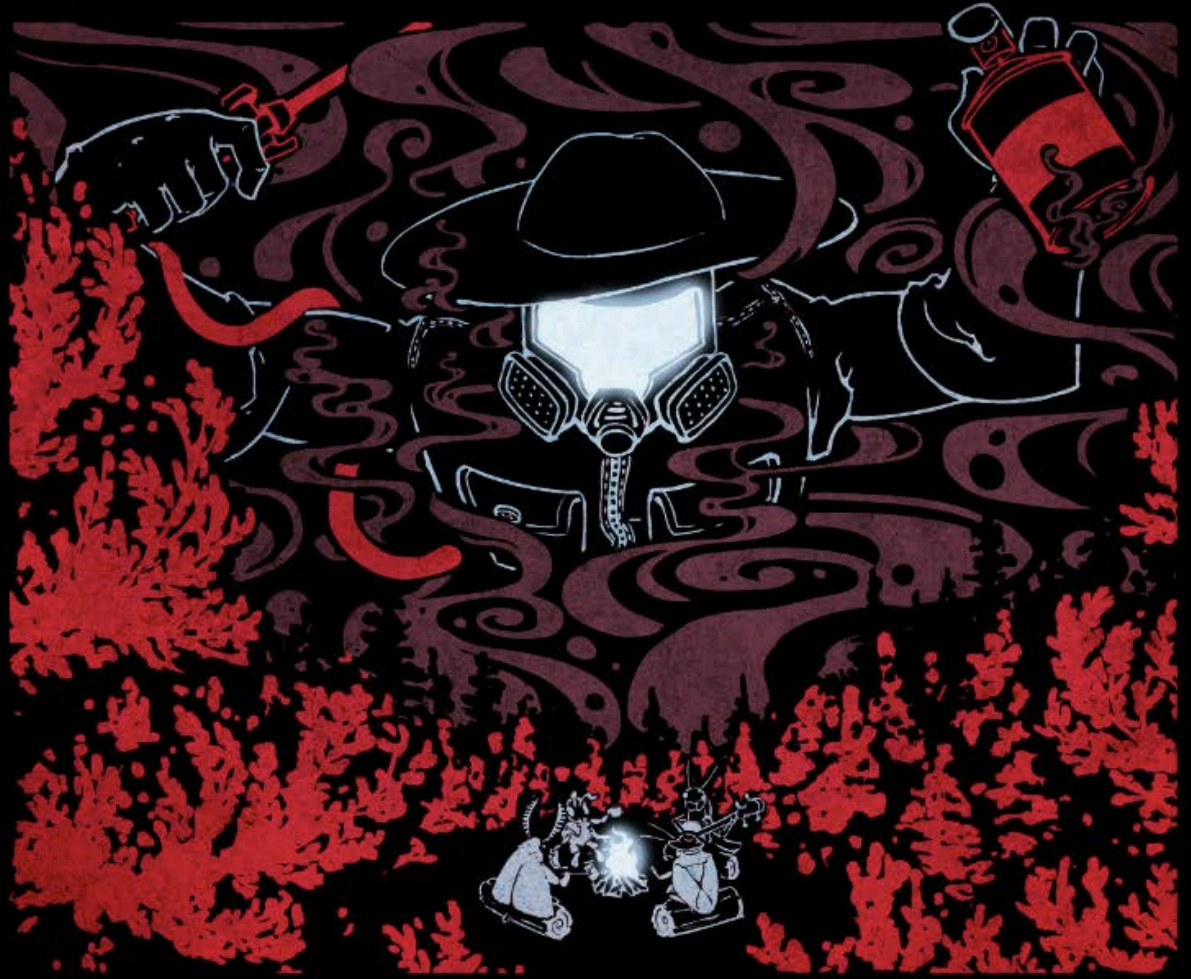
area with DDT solution...Spraying more than 100,000 acres is going to be a difficult operation and dangerous one. If the moth larvae aren't killed before mature, the forest will be gone. According to my calculations we have 30 days." To thwart this effort, the lumber guys decide to besmirch the good name of DDT and inflame the local populace to oppose the spraying by secretly spraying an unspecified deadly poison that kills livestock and wildlife and blaming the deaths on DDT. Long story short, the nefarious plot is revealed, DDT's good name is restored, spraying resumes, and presumably the tussock moth larvae, in good Western fashion, bite the dust.

This film piqued my entomological curiosity in three ways. First, I wondered which species of tussock moths was creating problems for Gene Autry. Whistling Pines notwithstanding, the western setting suggests that the tussock moth in question must have been the Douglas fir tussock moth *Orgyia pseudotsugata*, and not the strictly eastern pine tussock moth *Dasychira griseifacta*. Second, I found it remarkable that an entire screenplay revolves around a tussock moth, not exactly a household name today. As it turns out when *Whistling Pines* screenwriter Jack Townley must have been searching for a plot line, there was an actual dramatic tussock moth outbreak (of the Douglas fir variety) moth in 1946-1947 in the Pacific Northwest. By mid-September 1946, 10,000 to 12,000 acres of conifers in Oregon had been defoliated, with complete tree death on 500 to 600 acres (and, counting Idaho and Washington over 56,000 acres, not far off Gene Autry's 60,000-acre estimate). In the following summer, 14,000 acres across the region were sprayed by a C-457 airplane loaded with 1,000 gallons of DDT in fuel oil, which was followed by 100% mortality in the sprayed area and DDT's white hat was firmly in place. Although DDT was credited with the win, in retrospect, the Oregon tussock moth outbreak was already in its third year when the spray program began and caterpillars in unsprayed areas were dying in droves due to viral infection and predator attack. Mostly, though, I wondered if anyone involved with the film would have believed that 64 years later entomologists would be appalled that Gene Autry would initiate a spray program without informing local residents and that the *bad guys* were the ones telling local residents about adverse nontarget impacts of DDT spraying. Granted, according to the plot, this was a disinformation propaganda campaign aimed at undermining support for the spray program, but it was the worst kind of disinformation is that it was actually accurate. DDT trucks roll through town as people remark, "So that's the stuff, huh? I hate to think what'll happen when they turn it loose from that airplane. If it kills the bugs in the trees it'll kill everything else, won't it?" When a concerned citizen wonders "what'll happen to the fish?" one of Autry's forest ranger colleagues blandly assures him that "the timber's more important than the fish," and the local responds, "Not to the fish, it ain't." Another local wonders: "If everything we own is being exposed to this poison, shouldn't we be given the opportunity to take precautions?" Astonishingly, the answer to that question in 1949 was "no." Autry prevails, driving the lumber guys to acts of desperation, including opening up the spigots on a tanker truck labeled "Operation Flit Gun" and then apparently setting the DDT on fire. In an action-filled but confusing series of events, Autry arrives to put the fire out, multiple fist fights ensue, many people gallop across the landscape on horseback, there's a plane crash that dispatches the bad guys, and I think Autry gets the girl.

In an interesting case of irony, when DDT was finally banned in 1972, there was a provision for a recall of DDT in times of national health or economic emergency. That same year, EPA, under extreme political pressure, acceded to a Forest Service request to control a—you guessed it—Douglas-fir tussock moth outbreak in the Pacific Northwest, and 425,000 acres were sprayed, even though the populations had already started declining. What ramped up, though, were widespread contamination of livestock, game animals, and other nontargets and the glaringly apparent lack of necessity of the spray effort helped cement public attitudes against DDT and its relatives.

Our second feature, Syfy's *Locusts the 8th Plague* (2005), may have seemed familiar because almost every plot element in this movie has appeared in some movie or other we've shown in an earlier festival. Corporate conglomerate Silogen has decided that the best way to control agricultural pests without pesticides is to genetically engineer locusts, agricultural pests that, when they swarm, become essentially unmanageable, so that, instead of eating plants, they eat animal flesh. How could that possibly have unintended consequences? There's gorgeous Vicki Snow (played by Julie Benz), USDA veterinarian, fiancée of the entomologist and daughter of Russ Snow, the corporate executive who cooked up the bioengineered locust idea. Vicki Snow has the best-equipped USDA lab in the country, with a scanner that can in a matter of minutes identify locust stomach contents. There's the evil corporate executive more concerned with the bottom line than with the bloody dismemberment of employees ("We don't say anything about this to anybody. We've come too far, we've invested too much money"), the brilliant scientist who doesn't realize the consequences of his work but comes up with the solution at great personal expense *Brilliant scientist who doesn't realize the consequences of his work but comes up with the solution at tremendous personal expense* There's a pheromone lure. They have to respond because it's hard-wired into their genetic makeup"), *swarms of digital blurs attacking a picnic, a military commander who, after realizing that assault rifles and pistols aren't of much use in killing insects, wants to use a control technique that will destroy the town for the foreseeable future* ("It's the most deadly pesticide in the world. The US government didn't spray it in Afghanistan on the opium fields"), and scientific nonsense ("Spontaneous adaptation—it's a trait fairly common to amphibians and reptiles but in the insect world it's incredibly rare") and an assortment of other IFF tropes... And in a random notes—set in rural Prairie, Idaho, the movie was actually filmed in rural Bulgaria.

31ST INSECT FEAR FILM FESTIVAL



with the feature films:
RIDERS OF THE WHISTLING PINES
LOCUSTS: THE 8TH PLAGUE

FOELLINGER HALL
STARTING AT 6PM
SCREENINGS
BEGIN AT 7PM

FEB. 22, 2014

ALUMNI NEWS

John Anderson. I continue working. My main recent accomplishment was the publication, along with my colleagues at the Connecticut Agricultural Experiment Station, of the arboviruses in North Dakota. This was published in American Journal of Tropical Medicine and Hygiene. Among other findings, we reported the importance of *Aedes vexans* as a vector of West Nile virus. Former UI Entomology Professor William R. Horsfall would have been proud. I am also studying and isolating Powassan virus from the tick, *Ixodes scapularis*. This virus will likely infect humans in Illinois in the future.



Yehuda Ben-Shahar. Both Sarah and I are assistant professors at Washington University. My position is in the Department of Biology while Sarah is in the Psychiatry Department at the Washington University School of Medicine as a physician-scientist. My research is focused on behavioral genetics by using the fruit fly and the honey bee as models. I have a wonderful group of graduate students and postdoctoral fellows, who work on diverse questions that are related to mating behaviors, social interactions in groups, and the role of non-coding RNAs in neuronal and behavioral functions. Sarah continues her work on the genetics of nicotine addiction, as well as on public health issues associated with human genetic studies. We all also enjoy life in St. Louis since we moved here in 2008. Sports are now a major part of our family. Our daughter Noa (7) is a serious swimmer and our son Itai (10) plays club soccer. In contrast, our main sports-related activity is to go downtown to watch our beloved St. Louis Cardinals..!

Joel Coats (Ph.D. 1974, Metcalf student). I am continuing to enjoy my work doing research and teaching on pesticides. The primary research projects are: plant essential oils to enhance efficacy of synthetic pyrethroids on mosquitoes, effects of terpenes on insect nervous system receptors (octopamine, GABA, n-acetylcholine and tyramine receptors), novel natural and biorational repellents and insecticides, and the environmental fate of *Bt* proteins and new biotech traits. I teach the following graduate courses: Pesticides in the Environment, Insecticide Toxicology, Special Topics in Insect Toxicology, and portions of Principles of Toxicology and Laboratory Methods in Toxicology. I'm active in ESA, ACS and SETAC and take students to those conferences. To quote one of our grandchildren "I'm living the life!"

Randy Cohen. I am currently starting my 25th year as professor in the Biology Department here at CSUN. Counting the days until retirement, yet I managed to publish four articles last year. Susan is in semi-retirement—only working two days per week as a roving microbiologist in the Valley. Rachel is in her second year as an Assistant Professor at Minnesota State University in Mankato studying reproductive neuro-endocrinology of green anoles. Sarah is now an Administrative Assistant at CSUN working with her father in the Biology Department. Finally, Josh is starting his 3rd PhD year at the University of Oklahoma and is studying mammalian paleontology concentrating on Cretaceous marsupial teeth. He has made an exciting discovery this past year....look for his paper in Nature next year!

Ed Cupp. Things continue to go well. While being very busy after officially retiring in 2006, Mary and I are starting to slow down and spend more time relaxing and enjoying family and friends. Until early 2014, I had worked closely with colleagues at the University of South Florida School of Public Health and at the Centers for Disease Control in Atlanta as a technical consultant as well serving as a member of the Merck Company's Mectizan Expert Committee and the Carter Center's Onchocerciasis Elimination Program for the Americas. I served as chair of the latter program for 7 years. It was worth all the effort – river blindness has been virtually eliminated from the Americas and we now have an effective trap to collect vector black flies in Africa and the Americas (<http://www.ncbi.nlm.nih.gov/pubmed/24794201>) and know the "secret sauce" that black flies use to find human hosts (<http://www.ncbi.nlm.nih.gov/pubmed/25569240>). It's time to move on.

The big news is that we recently bought a 35-acre farm and plan to grow vegetables, grapes and hops for fun, health and wine-making. We will keep a few bees as well. We had been looking for such a place over the past 5 years and found it by accident coming home from a state-wide Sierra Club meeting. We decided to get off the beaten path (= interstate) and sure enough there it was sitting on top of a ridge with a tumble-down barn in need of repair and several fields with serious bramble problems. This place should keep us busy for the next few years!

Eric Day. I finished my year as President of the Eastern Branch ESA in March 2014 with a great meeting in Williamsburg, Virginia and Carol Anelli was the Banquet Speaker with a presentation on Benjamin D. Walsh! Nan, Graham, and I visited Gordon in Senegal at his Peace Corp. posting, a great trip in an incredible country.



Jodie Ellis. Jodie is the Executive Director of the Idaho Board of Veterinary Medicine.

Harland Wade Fowler, Jr. I am a retired public health officer of the U.S. Army Medical Service Corps. I was a student of Dr. Horsfall's at the University of Illinois (PhD, 1969). Best wishes for an eventful year.



Tugrul Giray. Fellow Entomologists,

It is great to be part of the extended family of UIUC Entomology! Please consider Department of Biology at the University of Puerto Rico, Rio Piedras campus your address in the subtropical San Juan, Puerto Rico. Since the last edition I have become a full professor and currently I am the interim chair of the Department of Biology. We have an excellent intercampus graduate program, and many entomologists within the program! Check out James D. Ackerman (now orchids but also orchid bees, in charge of the Zoology Collection, and the Herbarium with the largest collection of Caribbean flora), Riccardo Papa (Genotyping and Sequencing Facility, with exciting research on *Heliconius* butterfly evo-devo), Jose Luis Agosto-Rivera (fruit fly and honey bee circadian rhythms) and others with research involving insects. We also have an active Visiting Scholar program for short and longer visits for faculty at any stage of their career. Please do check in the near future for an internationally open and competitive postdoctoral fellowship program. [In my photo I am with the honey bee technician Mr. Gabriel Diaz (the one with the swarm of bees on his hand).]



Ellen Green and Nathan Schiff. Howdy y'all. We are both doing well and still living la vida loca in the Mississippi Delta. Our most recent news is that Ellen was named the chair of the Biology Department at Delta State University last July and is enjoying it more than she thought possible (although she now makes Nathan fill out paperwork if he wants dinner). One week after taking the reins, she was tasked with moving ten faculty members and their laboratories into temporary quarters while the science building was undergoing a \$14 million facelift. Shortly after the first round of moves, she was faced with an accreditation visit, a state inventory audit and programmatic review in light of a huge budget shortfall. It all worked out ok, but May, you didn't warn me properly! On the plus side, she was the first ever recipient of the Wayne Walley Award for Academic Excellence (complete with a medal as big as a cowboy belt buckle). She also learned how to bake bread this spring.



On the dark-side, Nathan is still gainfully employed with the Forest Service and was even promoted last fall (we're as shocked as you are). Collecting trips to French Guyana and Vietnam have swelled his ever-burgeoning insect collection. He even collected Alucitidae (look it up) in a malaise trap in Montana. Tragically, *Sirex noctilio* is not killing enough trees but we're hoping the sun will come out tomorrow as emerald ash borer is in central Arkansas. He would like to thank the entire continent of Asia for his continued job security. For fun and

amusement, he now plays basketball three times a week and is willing to go one-on-one with anyone who shows up. Perhaps not hard to believe that the Delta is a significant home court advantage.

When we're not working, we grow roses (over 40 in the yard now) and travel a bit. We went to the Galapagos in 2013 on a National Geographic's ship for a well-needed vacation and highly recommend it to all. Even though we knew what everything was, thanks to our excellent education at the University of Illinois, it was still amazing.



Gail Kampmeier. I retired from the University of Illinois in 2010, but remain active in the Entomological Society of America (ESA), Women in Entomology Network, and Biodiversity Information Standards (TDWG). I am also a Section Convener for the upcoming 2016 International Congress of Entomology for Biodiversity, Biogeography and Conservation Biology. I have taken over the ESA Fellows biography project and will be working with students to add narratives enriching the history of those we have honored for their outstanding contributions to entomology.



John Kane. John Kane is the Division Technical Services Manager for Orkin, Midwest Division, in Chicago, Illinois.



Gene Kritsky, MS 1976, PhD 1977. It has been an exciting and unusual year for Jesse and me. My book on Ancient Egyptian beekeeping will be published by Oxford University Press later this year, bringing to completion a project that has been 30 years in the making. Jesse and I, along with Bruce Noll, edited an e-book, *The American Entomologist Poet's Guide to the Orders of Insects*, which was published by ESA last September. I am still serving as Editor of *American Entomologist* and would welcome more papers from Illinois alums to feature. We look forward to seeing you at ESA and ICE.

Photo: Gene Kritsky at the tomb of Pabasa in Egypt.

Don Kuhlman. Having been retired since 1994, my interests include following events in Pakistan where I worked for two years, Cardinal baseball, Illini football and basketball, and travels around the U.S. and elsewhere in the world. We're also involved in several community activities in Champaign---and spending winters in Arizona !

Katy Lustofin. I was promoted from assistant to associate professor last year and have been awarded my first sabbatical, for next year (fall 2015), to study fluorescent millipedes.



Katelyn Michelini. From 2009-2013, I worked at the University of Chicago with the Howard Hughes Medical Institute managing a Sequencing Core. This gave me a lot of experience working with different labs and helping to design and carry out sequencing projects. After 4 years in the lab, I decided a change was in order and I left the University of Chicago. Since 2013, I have worked as a Field Applications Scientist at Illumina. The transition from the lab to the corporate world, as well as regular travel, was quite a change. I am currently based out of Chicago and cover a large territory encompassing Indiana, Wisconsin, Minnesota, North Dakota, and South Dakota. The majority of my job entails traveling to new customer sites to train users on the use of the technology and troubleshooting with existing customers.

On a personal front, I recently got engaged and will be getting married May 16th, 2015. We are currently looking to buy our first house. All very exciting things!



Rob Mitchell. I have spent the past few years in the Department of Neuroscience at the University of Arizona, courtesy of a PERT postdoctoral fellowship sponsored by the NIH. During my time here I have been able to try my hand at insect olfactory neuroscience in the Hildebrand lab, teach biotechnology at the community college, and (as usual) terrorize the local cerambycid fauna. I also must admit to some small schadenfreude while basking in the sun and watching polar vortices engulf Champaign-Urbana, but now that karmic debt is crashing home as I have accepted a faculty position at the University of Wisconsin campus in Oshkosh. There I will teach entomology, curate a regional insect collection, and build a chemical ecology lab - more than worth the trade in winter temperatures! My wife Lauren,

on the other hand, is thrilled to be returning to a climate that approximates her native New England and will probably force me to learn how to ice skate.



Lance Peterson. I am a retired advisor from Research and Development at Dow AgroSciences in Indianapolis, Indiana, and now live in Tallahassee, Florida. I spend my retirement time wood-carving, singing in several choral groups, along with taking time for traveling and ballroom dancing with my wife, Jan. We are enjoying life to the fullest!

Annie Ray. I am in my fifth year as an assistant professor in the Department of Biology at Xavier University, in Cincinnati OH. My appointment at Xavier is 100% teaching, and each year I am responsible for General Biology I and II, Introduction to Entomology lecture and lab, a study abroad course to Costa Rica, and senior capstone courses. In 2014, I was awarded the Joan G. McDonald Award for Outstanding Teaching in the Sciences.

My research focuses on mate location and recognition in longhorned beetles. I have several ongoing projects in collaboration with USDA APHIS and the US Forest Service, developing methods for monitoring and control of exotic beetle species. In September 2015, I will travel to Brazil as a Fulbright Scholar to study the chemical ecology of native longhorned beetle species that may pose threats to Brazilian and US agriculture.

Craig Reid. It's often said, "Live every day like it's the last day of your life," which of course is a fantastic sentiment...the only problem is, after you've told your boss what you really think about them, quit your job and spend your life savings in 24 hours...you've got the consequence of the next day to deal with. So try not to take it literally. :o)

It's as crazy as naming your pet dog Stay...come here Stay...fetch Stay. Talk about creating a dog with more issues than our government.

On the cool side...life and healing for us continues to be...adventure, adventure.

Each year, we learn more about how chi affects one's emotional, physical and mental health. Our skills are constantly evolving way beyond anything we could have foreseen or expected 27 years ago when we began this far out journey. Silvia has created a map of human emotions based on reading the chi blockages of over 7500 folks. We're finding that these emotional blockages are the keys to how physical and mental issues, and disease develop from over decades of suppressing or not addressing the negative effects of these various emotions.

Word of mouth is still the foundation of how people find us. We've been very fortunate and blessed to be able to continue helping folks worldwide (30 countries, 28 States). Each year brings new and intriguing challenges that solidify past theories into definitive results, and along the way we meet so many amazing and inspiring people. We've also been working with more animals.

San Diego is a major military hub and we continue to volunteer our services helping returning soldiers that hear from their buddies about what we do.

Although we put in 16 hours/day, 6 days/week, Sil has been doing plenty of R&D and has invented another groundbreaking healing tool still in early testing stages...stay tuned on this one...can be used by anyone, anywhere.

It was finally the right time to begin writing my memoirs this year about my adventures in Taiwan (1979-81) and the events leading up to marrying Silvia and overcoming cystic fibrosis (CF). Why now? Most people have heard of CF and know it's a deadly disease that gets worse with age; there's now a greater awareness and acceptance of alternative healing; and the fact I've been off all therapies and meds for 33 years shows a true staying power to what I learned. Of note, medical costs for folks with CF today is \$600,000.00/yr, My med costs since 1981...\$0.00.

The book will be done by my next birthday....3/30/14; I'll be 58. Not bad for a lad being told at 16 he'd be dead by 21, no ifs and or butts...oops, butts...sorry I was thinking about when my friend mooned our professor at Cornell.

We'd love to hear from you and know what you're up to. Please do live each day like it's your last...i.e. have fun with what you do...life's too long to not enjoy what you're doing.

In the meantime, have a fab year, and as always...may the chi be with you.

Robert Snetsinger. Dr. "Butterfly Bob" Snetsinger's mission is to educate the public about the importance of butterfly conservation and ecosystems, many of which are endangered throughout the world. Through his efforts he has encouraged the general public to establish butterfly friendly gardens. In 2011, the Tudek Trust, Ferguson Township, and Centre Region Parks and Recreation recognized Dr. Snetsinger's many years of outstanding work and dedication to the garden by officially designating the habitat as "The Snetsinger Butterfly Garden at Tom Tudek Memorial Park." The Snetsinger Butterfly Garden at Tom Tudek Memorial Park is a diverse ecosystem with over 30 resident species of butterflies and its garden is enriched with more than 200 species of native plants serving as caterpillar hosts and providing nectar for adult butterflies. The Garden was started in 1997.



Keith Solomon. I'm in my 6th year of retirement having just celebrated three score and ten. Highlight of last year was being elected as a Fellow of the Society of Environmental Toxicology and Chemistry. This is a picture of my wife, Sandra, and I in Cape Town.



David Stone. Marian and I, who are now empty nesters, continue to be Urbana residents after all these years. Marian retired as an Assistant Dean from the College of Fine and Applied Arts in June and is now back in the same job as a retiree. I continue at University Laboratory High School on the U of I campus, teaching Introductory Biology, Organismal Biology, Field Biology, and Genetics, co-chairing the Admissions Committee, and chairing the science department on rotational basis. I'm having a great time dabbling in the world of arthropod macrophotography!



Mark Sturtevant. Hello to U of I Entomology! I do not believe that I have provided an update. I live in Michigan, where I teach assorted classes at Oakland University (Intro Bio, Evolution, and our Senior Capstone class). In my spare time I like to travel around the U.S. with the family. While they see the touristy sites I can generally be found turning over rocks and logs, looking for arthropods and reptiles. Well, some things never change. I also have fun raising big insects, as the included picture shows.

Photos: [top] A trip to the Grand Canyon. (From left to right is Nicholas, me, Matthew, Michael, and She Who Makes Everything Amazing (Ann)); [right] (Hickory horned) devil worship. One of them is pooping. Look at the size of that frass!



Chadwick Tillberg. Chadwick Tillberg is an Associate Professor in the Biology Department at Linfield College in McMinnville, Oregon.

John Tooker. I am still at Penn State in a great Department with at least six other folks from the department at Illinois. I have a full lab with three postdocs, five grad students, and two undergrads. We are studying a good range of species, including slugs, but it is all plant-herbivore interactions, mostly in field and forage crops, though two folks are studying some cool interactions between goldenrod and its gall inducers.

James Zahniser. James is an Entomologist (Identifier) at USDA-APHIS PPQ in Puerto Rico.

Academic Alumni

Susan Fahrbach. Greetings from the land of the longleaf pine (*Pinus palustris*). It's hard to believe that more than 10 years have passed since I left the Department of Entomology. I simultaneously continue to miss my friends in Illinois and love the sunny South.

The Department of Biology at Wake Forest University has proved to be a good home for me. We are an old-fashioned, broad-based biology department, encompassing everything biological but purely medical topics. I am happy to teach our introductory course for majors (comparative physiology). My upper division teaching focuses on neuroscience, especially behavioral neuroendocrinology and development of the nervous system. Teaching the latter inspired me to write a textbook (*Developmental Neuroscience: A Concise Introduction*), which was published in 2013 by Princeton University Press. My lab continues to work on experience-dependent plasticity in the honey bee brain. Perhaps the most surprising aspect of this work to those who knew me at Illinois is that we have shifted more and more to field studies of honey bee foraging behavior. I have had several talented PhD students and many inspiring undergraduates to help me with these projects, and the National Science Foundation has been unexpectedly generous in its support. For several years another alumnus of Entomology at UIUC, Rodrigo Velarde, was a research professor in my laboratory. He even taught a very well-received advanced course in Insect Biology. He left last year to try his luck in the South American academic job market. We were very, very sorry to see Rodrigo go.

I became Chair of Biology in July 2014. I think that at last count we had 26 tenure track and teaching professors in our department, about 35 graduate students, and more than 200 majors, so life is busy. Every day I encounter situations that leave me asking "What would May do?" I married Wake Forest Professor of Theatre Jon Christman in lovely Asheville, NC, last May, which means that the part of my life not filled with science is now filled with the performing arts. My older son, Abe, is now married and works in Washington, DC, in the DC bureau of the Asahi Shimbun, the second largest daily newspaper in Japan. His beat is Capitol Hill. My younger son, Nate, is a senior in high school. His stated goal in life is "to be able to get a job after college without having to go to graduate school." To accomplish this he plans to study computer science with a specialty in cybersecurity.



Photo: Peter Price with one of the trees planted in 2010. ©Tom Bean

Peter Price. As I age, time appears to accelerate, so I am never sure how the World and I keep synchronized. But my weekly activities remain routine: cooking, running, hiking with Maureen, volunteering at the Flagstaff Family Food Center, and splitting wood to satisfy the rapacious appetite of the wood stove during the cold winter months at 7,000 feet a.s.l. in Flagstaff, Arizona.

I finished field work in 2013 and submitted in 2014 what is probably my last paper – on my 30-year study on the population dynamics of the arroyo willow stem-galling sawfly, *Euura lasiolepis*. This shows the strong bottom-up effects of precipitation and drought on willow growth, and the positive response of the sawfly's maternal preference for, and larval performance on, vigorous growth after high precipitation.

During the growing season I work on a reclamation project to transform the ditched Rio de Flag into a green belt. We now have about 400 trees and shrubs planted, all with drip irrigation, mostly narrow-leaf cottonwood and local willows, so watering, fertilizing, and weed whacking are necessary activities for much of the year.



Amy Toth.

Obituaries



URBANA – **James "Jim" Gordon Sternburg**, 95, of Urbana died at 7:40 a. m. Friday (April 11, 2014) at Meadowbrook Healthcare Center, Urbana. Jim was born Feb. 22, 1919, in Chicago, the son of Paul Charles and Eva Schild Sternburg. He married Margaret Eileen Mayer on Nov. 27, 1954, in Urbana; she died March 1, 1989. Jim grew up in Wellsville, New York and Glen Ellyn, Ill. During World War II, he served as a Photographer's Mate First Class in the U.S. Navy, Atlantic Fleet. After his discharge in 1945, he began what became a long and productive association with the Department of Entomology at the

University of Illinois at Urbana-Champaign. He entered the department in 1945 as a freshman; as an undergraduate, he took the last class taught by Clell Metcalf, renowned entomologist and second Head of the Department. Sternburg thus had the distinction of being personally acquainted with all but one of the heads of the department, which was formed in 1909. In fact, he himself served as acting head twice, in 1964-65 and 1983, when department heads Clyde Kearns and Stanley Friedman, respectively, went on sabbatical.

By 1952, Jim had earned bachelor's, master's and doctoral degrees from the University of Illinois in entomology. In his PhD work in the department in the early 1950s, he carried out pioneering biochemical work on how insects become resistant to insecticides. In particular, under the supervision of his doctoral advisor Clyde Kearns, he identified and characterized the enzyme DDT-dehydrochlorinase in pesticide-resistant house flies, thereby demonstrating for the first time a biochemical mechanism underlying resistance to DDT. This short doctoral thesis (under 100 pages) was probably the most influential thesis to come out of the department during the decade; his 1954 paper with Kearns and Moorefield in *J. Ag. Food Chem.*, was cited as recently as 2013. During the course of this work he observed that the extensive use of DDT to save the campus elms from Dutch elm disease, carried by European bark beetles, was linked to the death of robins on the UIUC Quad and suggested that DDT accumulation in the tissues of earthworms and other prey were responsible for those deaths; Jim was thus one of the first people to recognize adverse environmental effects of overuse of persistent insecticides.

Later in his career Jim carried out fundamental research in conjunction with fellow entomology faculty member Gilbert Waldbauer on the evolution of mimicry in swallowtail butterflies and other insects, work which was featured in *National Geographic* and in several introductory biology textbooks. Graduate students whom he supervised have continued to enhance understanding of butterfly biology after graduating; among others, Michael Toliver, as a member of the faculty at Eureka College, served in multiple leadership positions within the Lepidopterists' Society, including serving for several years as editor of the *Journal of the Lepidopterists Society*.

Throughout his career Jim was a beloved teacher, always enthusiastic and generous with students at all levels, especially if he was talking about butterflies. Classes he taught over the course of his career included Introductory Entomology, Insect Morphology, a summer course for teachers, and a general education course called "Insects, Man and the Environment." Even after he retired officially in 1988, he gave numerous lectures in biology courses, with his final campus appearance, in an Honors Biology course, in 2006. As an octogenarian retiree, he served as an instructor in three-day field classes on butterflies and dragonflies, sponsored by the Illinois Natural History Survey; participants in these courses decades younger had trouble keeping up with him in the field, particularly in pursuit of butterflies.

Jim served in the US Navy from 1942 to 1945, working as an aerial photographer. For one year during his hitch, he was based in Trinidad, BWI, where he pursued his passion for entomology collecting tropical insects when not on duty. After the war, he combined his photography skills with his entomological expertise and became a world-class insect photographer. His images, always taken of living, not pinned, insects, formed the basis of three field guides: "Field Guide of the Butterflies of Illinois," "Field Guide of Silk Moths of Illinois" coauthored by John Bouseman, and "Field Guide to the Skipper Butterflies of Illinois," coauthored by Jim Wiker. Inexhaustibly generous, Jim shared his immense photo library with the department and his images graced class lectures in multiple entomology courses for generations of graduate and undergraduate studies. His spectacular and meticulously curated insect specimens as well continue to serve as invaluable teaching aids for students today.

An ardent conservationist, Jim was a longtime member of the Izaak Walton League of America and in 1998 wrote a history of the Champaign County Chapter with Bruce Larson, in commemoration of the 75th anniversary of its founding. Blessed with the greenest of thumbs, he raised fish (including native Midwestern species) and orchids. Jim was an extraordinary naturalist, a superb scientist, a gifted teacher, and a profoundly and fundamentally nice man; he is sorely missed.

Wallace LaBerge



URBANA – Dr. Wallace Edmund LaBerge, 86, passed away Monday (July 22, 2013) peacefully at Carle Foundation Hospital, Urbana, surrounded by family.

Wally was born Feb. 7, 1927, in Grafton, N.D., to Emelia Flora Lessard and Daniel Joseph (Dieu Donne) LaBerge. He was the second child of seven and is survived by brothers Tom LaBerge, Dick LaBerge and Donny LaBerge, and his sisters Frances Ensminger and Suzanne

Burns. His older sister, Georgette LaHaise, as well as his parents, precede him in death.

He married Betty LaMont, a native of Grafton, N.D., on Aug. 9, 1958; she survives. Also surviving is a son, Daniel (Venus) LaBerge of Arlington, Va.; a daughter, Lesle (Dick) Joanis of Cary, N.C.; a daughter, Laura (Tom) Carroll of Silver Spring, Md.; and three grandchildren, Brian, Daniel and Emelia Carroll.

Wally studied Zoology at the University of North Dakota, where he received a B.S. in 1949. As an undergraduate assistant in Biology, he was asked to teach fellow students due to the demand of veterans returning from World War II. In 1951 he studied under Dr. Charles Michener at the University of Kansas, Lawrence, as a research assistant. In 1952 he was appointed a National Science Fellow at the University, where he served as an instructor and assistant professor in Entomology.

Wally and Betty moved to Ames, Iowa, where Wally worked from 1956-1959 as an associate professor in Zoology and Entomology. In 1959 they moved to Lincoln, Neb., where their three children were born and where Wally was a professor in Entomology at the University of Nebraska.

Moving again in 1965 to Urbana, Ill., Wally worked at the Illinois Natural History Survey until his retirement in 1994. Beginning as an Associate Professional Scientist, he was also an Adjunct Professor in Entomology training new scientists. In 1969 Wally was honored to be appointed Principal Professional Scientist, Center for Biodiversity, Illinois Natural History Survey. He also served as acting chief of the Survey, as well as section head.

In 1982 Wally and Betty spent a year in Washington, D.C., where he served as Program Director of Systemic Biology at the National Science Foundation. A close work associate and neighborhood friend nominated Wally for the Thomas Say Award. As was written in the nomination: "In the last 34 years, Wally has amassed an unprecedented record of the systemic and evolution of new world bees." At the time of the nomination, Wally had revised 10 genera of Hymenoptera: Apidae and Andrenidae, with *Melissodes* and *Andrena* being his focal point. He examined over 1,088 type-specimens, stabilized the names of 514 species, described 166 new species, relegated 408 species names to synonymy or homonymy and examined over 153,789 specimens.

Wally was very thorough in his research: he updated the nomenclature of each species, constructed keys for identification, in addition to interpreting the phylogenetic

relationship of the species within each subgenus. He also recorded the host plants, established feeding habits, and habitation, and mapped distributional patterns of the bees he studied. In addition to this research, he also investigated the zoogeography of bumblebees and the biology of various ants, spending time in Mexico studying solitary ground inhabiting bees. One of his sons-in-law, who studied Plant Biology at the University of Illinois, considered Wally the "James Joyce of bees."

Wally was a person of multiple talents. He was artistic and had a flair for baking. He kept a large garden and greatly enjoyed flowers; zinnias, irises, wild prairie sunflowers, and roses were among some of his favorites. He was known for his excellent tomatoes in particular, which his family admired and relished. He was a skilled craftsman renovating the kitchen of their home, adding rooms to their basement, constructing an entertainment center, and a tree house for his children to enjoy. He participated along with Betty in the construction of their community playground, and with the Care-a-Vanners group in over a dozen builds for Habitat for Humanity.

A committed Catholic, who was comforted by his faith, Wally was a member of the St Patrick's Church community, where he was elected onto the Parish Council, and served as a Eucharistic minister. He was an enthusiastic fan of Illini basketball and held season tickets, striving to attend every game.

Among Wally's passions was music, especially classical music, and he loved neighborhood sing-a-longs in the summers and holidays. He played the piano; classical pieces as well as 1930s and '40s tunes from musicals and movies. He played French horn and Glockenspiel in the Grafton band while growing up in North Dakota.

He also enjoyed the French language, which he spoke as a child, and French Canadian culture, and foods. He loved camping with his family and being in nature, sharing his delight in unique insects and plants. He once remarked that his first love in science was Botany.

Wally was offered a job at Harvard University but he had already accepted a position at the University of Kansas and felt he needed to keep his word. Edwin O. Wilson was offered the job at Harvard, and went on to become a popular and well-known author of social insects, ants in particular, and biology. Wally remarked that this was meant to be because E.O. Wilson had more talent.

Wally was a shy, gentle and unfailingly kind man; revered by his children. His delight in the details within nature was a great gift to his family. Always a gentleman, complimentary of others, his family and friends will sorely miss him. He delighted in children, in particular his grandkids, and he was unbounded in his gratitude for his family and his special neighborhood friends. He enjoyed comparing gardens with his dear neighbors. He also enjoyed reading mysteries, putting together puzzles, and playing card games or board games with his grandchildren.

William Delaplane Jr.



OAK PARK – William K. Delaplane Jr., former co-owner of Illini Pest Control Inc., located from 1950-2008 on South Neil Street, Champaign, died quietly on March 22, 2013, in Chicago. He was 98.

Bill, as he was known by all family and friends, was a colorful character with an unusually outgoing personality. He thrived on meeting people and had an incredible ability to remember names, even decades later. He truly never knew a stranger.

He had a penchant for humor, always looking to share a laugh with others through often-corny jokes and silly pranks. He never lost his ability to spontaneously insert a pun or one-liner into conversations, even in his final weeks.

As a retiree, his business card presented his name as "Sweet Old Bill," with the caption, "sometimes people call me Sweet Old Bill, but more often they just use the initials..."

Bill was born at home on Sept. 1, 1914, in Burlington, Ind., and graduated from Purdue University in 1938.

He first came to Champaign as a graduate student in entomology at the University of Illinois in 1940, with his wife, Nancy. His studies were interrupted for service in the U.S. Navy in New Guinea from 1943-46.

Upon returning to Champaign, he resumed his graduate studies and took a job at the Illini Pest Control (IPC). He and his wife then purchased the fledgling company in the late 1940s from a fellow entomologist and friend, Dr. Dwight Powell, and his associates, and Bill went on to serve as the company's business manager for more than 40 years. He finally completed his Ph.D. in 1958, and in the years ahead, IPC expanded to provide pest control service throughout East Central Illinois and part of Indiana.

In the early 1950s, Bill and Nancy built a rural family homestead west of Champaign near White Heath, where he and Nancy raised their five children, Montrew, Bill III, Dietra, Diana and Gary. He named this home, located on the Sangamon River, Heaven for Seven.

The kids went to school in Mansfield, and the family attended Centerville Methodist Church, near White Heath. He relished any of the kids' social events, as he was a kid at heart and delighted in entertaining their friends with practical jokes.

Despite his success in business, Bill was restless. In 1963, he accepted an academic position with Ohio State University, where he was a professor and agricultural extension specialist for three years, after which he returned to IPC. In 1969, he joined the United States Agency for International Development and served for more than two years in Orissa, India, as a plant protection adviser, teaching Indian farmers how to increase rice production. But the political relationship between the U.S. and India soured in late 1971, and all American contractors were evacuated. He and Nancy relished their years in India, developing family friendships that survive today. They returned to Heaven for Seven and Bill's work at IPC.

In 1987, Bill turned over the manager role at IPC to his younger son, Gary, though he remained active in their general business affairs. Several years after Gary's unexpected death in 1994, his youngest daughter, Diana, assumed management of IPC. The company was sold in 2008.

As a young businessman, Bill was actively involved in the Champaign-Urbana Chamber of Commerce, as well as the Jaycees, serving as president in 1948. He held a lifetime appointment as a senator in Jaycees International.

Bill served as president of the Illinois Pest Control Association and vice president of the National Pest Control Association in the early 1960s. He remained active in various other local service groups, including a longstanding membership with the Elks Club, the Moose Lodge, as well as his college fraternity, Acacia.

Bill's older son, William K. Delaplane III, was killed in an Air Force training mission in 1973. That event provoked a strong emotional depression and a personal reassessment for Bill. Eventually he and Nancy divorced in 1978, remarried briefly in 1983, followed by a second divorce. Nancy continued to live in the family home until it was sold in 1997, when she moved to Oak Park, a suburb of Chicago, to live with her daughter, Dietra, and her family.

Bill always retained close ties to Nancy, who died in 2007. His daughter, Montrew Batson, currently lives in Orange Beach, Ala., and his daughter, Diana, lives in Champaign. His son Bill's widow, Wanda Delaplane, lives in Lexington, Ky., and Gary's widow, Dawn Janich, lives in Bala Cynwyd, Pa.

From his youngest years, Bill loved music and sang in many vocal groups throughout his life. He learned to play the trombone in high school, and he joined the marching band at Purdue so he could have free admission to the football games. He had an extraordinary memory for song lyrics, and his favorites were those of the 1920s, '30s and '40s.

In 1987, Bill married Elaine Cox of Urbana. They were dancing partners and spent winters in St. Petersburg, Fla., where there were many musical and dancing venues for seniors. Both in Champaign-Urbana and in Florida, Bill regularly performed as a singer/dancer in musical shows for retirees, the Geritol Follies at Sunshine Theater in Champaign and the Town Shores Chorus in Florida. They made their last trip to Florida in 2006.

After a mild stroke in 2010, Bill moved to a retirement facility in Oak Park to be near his daughter and family. As his health deteriorated, he was confined to a wheelchair in his last months, though he remained sharp mentally, singing songs and spewing jokes and puns at his visitors and caretakers.

With his gregarious personality, Bill was often invited to emcee various events. But he was also stubborn and opinionated. He loved to discuss politics, policy and people, and enjoyed a strong argument. If the topic was geography, music or insects, he was virtually always right. He was an avid reader, especially of magazines and newspapers, and he clipped articles and cartoons rabidly to mail to friends and family.

Bill is survived by his wife, Elaine. He outlived his younger brothers, Robert and Joseph, and his younger sister, Ellyn. Humor was a pervasive talent in the Delaplane family, with Bill often playing second fiddle to his brother Joe. A younger half sister, Jackie Higley, of Peru, Ind., and a stepsister, Jeannette Hipskind, of Wabash, Ind., also survive. He remained in close contact with many lifelong friends and family members scattered around the country, including numerous nieces and nephews.

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