

Biospheres



GLOBAL PERSPECTIVES



**DEPARTMENT OF ECOLOGY,
EVOLUTION, AND
ORGANISMAL BIOLOGY**

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ON THE COVER: Biology 394B students at
Xuantunich, a Mayan ruin in Belize. *Photo
credit: Jordan Satler*



Photo by Christopher Gannon.

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LETTER FROM THE CHAIR

Greetings former Students, Friends, and Alumni! It is a pleasure to write to you again to share with you the many activities and successes of our EEOB community!

I have enjoyed the many new challenges of serving as a first-year department Chair and have appreciated the reward of representing a wonderfully productive and collegial department. At Iowa State, the three pillars of our land grant mission are teaching, research, and service, and as illustrated in this issue of Biospheres, EEOB faculty and students excel at all three.

Increasingly, there is the need to foster dialog and mutual understanding among individuals with diverse points of view, both within the US and abroad. A global perspective is an important element of EEOB that is illustrated through the multiple complementary activities described in this issue. From study abroad in Belize to research activities in Mexico, the Mariana Islands, and elsewhere, we provide Iowa State undergraduate and graduate students with opportunities to see the world and gain cultural and learning experiences that enhance personal development and career opportunities. The international theme continues with the College of Liberal Arts and Sciences recognizing the unique contributions of Drs. Dean Adams and Lynn Clark to teaching and research abroad, honoring each with an International Service

Award. Further international awards have been granted to Drs. Amy Toth and Jonathan Wendel, who have received prestigious Fulbright US Scholars Fellowships to spend significant time in Argentina and Spain, respectively, and interact with scholars in those countries. These fellowships are extremely competitive and it speaks very highly of our faculty to have two Fulbright Scholars within the same department at the same time.

The international perspective extends to our efforts in promoting diversity and inclusion at Iowa State. Indeed, EEOB faculty and graduate students are actively involved in the Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS), which promotes the success of students from diverse backgrounds in the fields of science, technology, engineering, and math (STEM). Of special note, two EEOB graduate students have received special recognition by SACNAS: Bryan Juarez, who received an award for best student presentation at this year's annual meeting, and Daniella Flores, who has been elected to serve on the SACNAS Board of Directors. These are distinctive honors and we are proud of their efforts and the very positive way in which they represent EEOB and Iowa State University.

Other significant news includes a successful move this past fall into much needed teaching and research space in the new Bessey



Addition. In this past year, EEOB has also been extraordinarily successful in competing nationally for research support, with all of our pre-tenure faculty and many of our tenured faculty obtaining major external research grant awards. This enables EEOB faculty to lead world-class research programs, and to provide mentored, hands-on field- and lab-based training of Iowa State undergraduate and graduate students

You too can support EEOB! Indeed, there are many ways you can make a difference in the success of our teaching and research programs. Towards this end, we have included for your use a form on the last page of this issue of Biospheres and if you have an interest in our activities and the future of EEOB, I encourage you to contact me directly!

A handwritten signature in black ink, appearing to read 'John Nason', written in a cursive style.

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A group selfie of the Biol 394B course in Belize.
Photo by Tracy Heath



BIRDS, BATS & BIOLUMINESCENCE IN BELIZE

By Jacki Hayes

Imagine encountering a bioluminescent landscape straight out of the movie *Avatar*. This was the experience of eleven undergraduates this past May when they visited Belize with Dr. Tracy Heath, assistant professor, and Dr. Jordan Satler, post-doctoral candidate. As part of the Biology 394B course, the students spent one week on the mainland of the Central American country and one week on an island in the Keys.

Heath, Satler, and students began meeting weekly after Spring Break to prepare for the trip. During these meetings, students were introduced to the country and its culture. Students also created group presentations on a various aspects of Belize.

The course offered experiential learning in tropical forest, limestone cave, and marine ecosystems. One focus of the class was to gain experience in techniques used in the study of tropical ecology. During the first week, students stayed at the Toucan Ridge Ecology and Education Society (T.R.E.E.S) research and education center in the foothills of the Maya Mountains.

“We did some bird banding one morning, so we saw how researchers will band migratory, as well as resident birds. We did mist netting for bats. The students got to see how you handle bats, the measurements you take, and how you properly identify these things. We did some mammal tracking, as well. We also did some black-lighting for insects at night, which was my personal favorite,” said Satler.

Another focus of the course was the cultural experience of interacting with Belizeans, including Mayan and Garifuna people, and the exploration of Xunantunich, a Mayan archeological site. The second week of the course took place on an island owned by a Garifuna family. This was the highlight for some students.

Senior in Biology and Environmental Science, Juan Carlos Mungaray, said, “My absolute favorite part had to be between either the dead man dance with the islanders of Billy Hawke Caye or the bioluminescence in the mangroves. The dance was absolutely fun to watch and a joy to take part in. I have never seen the human body gyrate like how I saw during that dance. Shakira had

nothing on our host family. The bioluminescence on the other hand was magical. It felt kind of like a scene from the movie *Avatar*. It is fairly hard to put into words how beautiful it was and it’s certainly something I will remember for the rest of my life.”

Two aspects of visiting a new culture that can be challenging are navigating a language barrier and experiencing new foods. The official language of Belize is English, which makes the country very accessible for Iowa State students. But the foods are different than the traditional Midwestern fare, which had Heath concerned.

“We had a really great group of students who were open to eating everything. I was preparing myself to have to coach students to eat the food. But they ate everything and no one complained about anything. It was a really easy group to make happy,” said Heath. “I love birding, and I love being outside, but I enjoy traveling mostly to meet people and eat food. And I was glad they were up for that too.”

The course, which is partially funded by an NSF grant, will be offered again in the Spring/Summer of 2019.

RESEARCH SOUTH OF THE BORDER

By Jacki Hayes

Over the years, many graduate students have enjoyed the opportunity to explore new countries while completing their degrees. Two students, Garrett Janzen and Justin Van Goor, have spent time in Mexico in order to collect data from their international research sites.

As a member of Dr. Matthew Hufford's lab, Janzen investigates domesticated maize in central Mexico. Domesticated maize spread to vastly different environments than that of its origin. Some of these environments include the highlands of Guatemala, the U.S. Southwest, the Mexican Central Plateau, and the Andes mountains. The Hufford Lab is investigating questions surrounding the genomic evolution of maize as it adapted to the various environments. Janzen, in particular, is exploring how ancient maize landraces adapted to diverse conditions across the Americas.

When asked about the challenges he faced working in a different country, Janzen said, "You're in a new climate and a new environment. I know some Spanish, but I still struggle. I spent an hour trying to find anti-itch

cream. I couldn't find the word for mosquito."

While Janzen traversed central Mexico, Van Goor explores northwestern Mexico, specifically Baja California. As a member of Dr. John Nason's lab, Van Goor investigated the evolution of species interactions. His study system comprises a wild fig, its species-specific fig wasp, and a nematode parasite. He has visited Mexico six times, his trips lasting two weeks to two months. His research trips begin in the northern section of Baja, sampling and camping as he and fellow lab members move south. Along the way, they stop at nine field sites to complete field experiments, such as exclusion and longevity experiments.

Like Janzen, Van Goor's time in Mexico has not been without challenges. During his last trip, he suffered a cornea ulcer after running into a tree branch. The local medical clinic was able to start him on a round of antibiotics. But he had to travel over a



Justin Van Goor and Dr. Derek Houston in Baja California, Mexico.

mountain to La Paz, 45 kilometers north for further treatment.

"I had an infected eyeball, in Mexico, in the summer, driving a stick shift into a major Mexican city, over a mountain, and this is the day we also got hit with a tropical storm," recounted Van Goor. "If there was one thing that was nice, it was cloudy."

When asked what he enjoyed about international work, he said of Mexico, "I love Mexico. The people are really friendly, the food is awesome, the landscape is amazing, too. With the way we've done the field work in Mexico, there's a lot of freedom. You're seeing all these cool places, and you're staying in all these different cities, and meeting all these people."

FULLBRIGHT FELLOWSHIPS

OFFER PRESTIGIOUS INTERNATI

By Jacki Hayes

Two EEOB faculty members are now 2019 Fulbright Scholars. Associate Professor Amy Toth will receive support to extend her research to the Patagonia region. Dr. Jonathan Wendel, Distinguished Professor, will use his grant to mentor early-career researchers in Madrid, Spain.

The Fulbright Program is sponsored by the U.S. Department of State's Bureau of Educational and Cultural Affairs and operates in 160 countries. The program serves to increase understanding between U.S. citizens and citizens around the world through an exchange program. It is considered one of the most widely recognized and prestigious scholarships in the world. Five hundred grants are awarded to the Core Fulbright Scholar Program each year, which funds teaching, research, or combination teaching/research grants in over 125 countries. Grants are offered in all academic disciplines, with the exception of medical research involving patient contact.

The Fulbright Scholar Program

will help support Toth in her upcoming sabbatical studies at the Universidad Nacional del Comahue in Bariloche, Argentina. She will collaborate with Argentine ecologists to study *Bombus dahlbomii*, the giant Patagonian bumblebee. Native to South America, specifically Argentina and Chile, *Bombus dahlbomii* is the largest bumblebee species in the world. It is sometimes described as a "flying mouse."

The species has experienced a 54% population decline in the last ten years, landing it on the endangered species list. In Argentina, the species has been almost completely replaced by an invasive European bumblebee. A survey of the eastern slopes of the Andes in 2011 failed to find any bees where they had been reported abundant in 2004. In 2011, southernmost subpopulations were still numerous, but a new survey in 2013 found the invasive species encroaching in this region as well.



Dr. Amy Toth's first encounter with *Bombus dahlbomii* at York University.

Toth and her collaborators hope to find specimens in these refuge areas and generate the first-ever genetic information for this bee species. The information may help them understand and counteract the causes of the population decline.

Sequencing the genome of *Bombus dahlbomii* is step one. The genetic

ONAL RESEARCH OPPORTUNITIES

information has the potential to help answer several questions. For instance, do the genetics of the bees in refuge populations help them survive in some way? Toth will also examine the genetic variations of the populations to determine if too much inbreeding has occurred. Lastly, they will sequence the RNA to look at patterns of gene activity. This can show them whether the bees are encountering disease and/or starvation.

“I do genetics and genomics as related to basic questions. I’m usually ask ‘how do things evolve?’ and ‘what are the evolutionary processes that give rise to complex phenotypes?’. Those are the questions I’m usually asking. This is very different. This is ‘how can you use genetic information and apply it to conservation. It’s a field of conservation genomics, and it’s new for me. That’s exciting,” said Toth.

In addition to her research, Toth will also teach during the year she spends in Argentina. She hopes that her time will also establish a trans-American partnership for bee conservation as well as facilitate ecological genomics research in

Argentina.

While Toth will use her Fulbright grant for research in South America, Wendel will travel to Madrid, Spain. There he will serve at the Royal Botanical Garden. His research while in Spain will focus on plant genomes. However, a large portion of his time will center on mentoring early-career researchers, teaching a short-course in plant evolutionary genomics, presenting lectures, and organizing a scientific conference on ecological and evolutionary genomics of plants, with a focus on early-career and female scientists as invited speakers.

“I thought this would be a nice opportunity to see a different way to do science, participate, and see if I could help, and also learn,” said Wendel.

Wendel will spend autumn of 2019 in Spain. Prior to his Fulbright work, he will also serve as the “Leverhulme Professor” at the Royal Botanic Gardens in Kew, London for the first half of 2019. While there, he will co-organize two meetings, present seminars across the U.K. and teach a Masters of Science course on plant and fungal taxonomy, diversity, and conservation.



Dr. Jonathan Wendel with the Pohl Conservancy cotton collection.

REWARDS

OF INTERNATIONAL SERVICE

By Jacki Hayes

Each year, the College of Liberal Arts and Science presents a limited number of ISU faculty members with the International Service Award. The award recognizes faculty for outstanding international service in terms of teaching, research, or administration, within the United States or abroad. EEOB was recently honored to have two faculty member presented with this award - in 2017, Dr. Lynn Clark, and in 2018, Dr. Dean Adams.

Fluent in English, Portuguese, and Spanish, Clark conducts research and teaches in countries throughout Latin America and elsewhere. With a research focus on grasses, and a specialization in

bamboos, she must go where the plants are. She has organized research and collection expeditions to Argentina, Brazil, Chile, China, Colombia, Cost Rica, Ecuador, Mexico, Puerto Rico, and Venezuela. Clark shares her international activities regularly, in classes here at Iowa State, via a “virtual tropical field trip” that she acts out in full tropical-research garb and character, embellished with all the details of a seasoned jungle explorer.

Clark was a founding member of the Grass Phylogeny Working Group and established the Bamboo Phylogeny Group, both consisting of a team of international scholars. As Director of the Ada Hayden Herbarium, Clark is on call to provide assistance to herbaria around the world.

In the last 17 years, Adams has organized 15 international workshops in eight different countries, sharing his quantitative approaches to morphometrics with hundreds of researchers representing nearly 40 different nationalities. This summer, he taught a workshop in Sweden, Organized by Geneco, which a consortium of Nordic countries. Workshop participants hailed from Sweden, Norway, Finland, Denmark, and Iceland. Another workshop is planned for Chile in 2019.

When asked about the experience of teaching workshops internationally, Adams said, “We get to see and train the next generation of scientists around the world. Many countries don’t have graduate education like we have it set up here [United States]. Some countries, even European countries, are light on coursework and very heavy on research. And so students who need to learn a new skill, workshops are the only way they can do it.”

He has published extensively with his international collaborators. Of 120 peer-reviewed publications, 28 included at least one international collaborator, and altogether, they included 54 international co-authors from 17 other countries.

Adams was appointed as a Visiting Associate Professor at Università degli Studi di Firenze, Italy in 2009-2010 and Professeur Invité at the Université de Bourgogne, France in 2015-2016, as well as Chercheur Invité (Invited Researcher) at the Conseil Régional de Bourgogne, France. He has given 12 international talks and research seminars in eight different countries, including Canada, France, Greece, Italy, Mexico, Portugal, Spain, and the United Kingdom.



Dr. Lynn Clark during a research trip in Colombia. Photo by Eduardo Ruiz-Sanchez



MARIANA ISLANDS RESEARCH STUDIES WHAT HAPPENS

IN A FOREST WITHOUT BIRDS

By Elizabeth Peterson

The island of Guam presents a unique study opportunity for students in the lab of Haldre Rogers, assistant professor of ecology, evolution and organismal biology.

On Guam, the brown tree snake was accidentally introduced after World War II on military cargo. In the decades following, the snake caused the total disappearance of birds on the island.

North of Guam, other Mariana Islands have similar plant communities and still have a similar population of birds to what used to be on Guam. This presents a unique opportunity to compare the islands.

“The whole accidental experiment allows you to ask some really unique questions that you couldn’t answer in other systems,” said Brittany Cavazos, graduate student in ecology, evolution and organismal biology.

Cavazos studied how plants on Guam have adapted to the loss of

birds in their environment. With birds no longer facilitating seed dispersal are plants changing? Cavazos studied whether plants put more resources into their fruit in terms of fruit size, fruit number, and seed number. Two undergraduate students working with Cavazos looked at the same question but focused on leaf size and thickness in relation to gaps in the forest.

The research in Rogers’ lab also considers the conservation effort to successfully reintroduce birds to Guam. If birds are successfully brought back, the snake will have to be controlled, but this could lead to an increase in another invasive species – rats.

“Guam is struggling with these different management scenarios,” Ann Marie Gawel, a graduate student in ecology, evolution and organismal biology, said. “It’s really difficult to control snakes and bring birds back. That’s a really tall order. Do we control all the other things as well? And what happens when you do? Is it a step in the right direction or are you making things worse?”

Gawel spent last summer investigating how well rats in Guam disperse seeds. Rats, like birds, eat many seeds, but it is unclear whether their digestion aids in dispersal or destroys the seeds. She hopes to make this clearer through her research.

She is also interested in the public’s perception of conservation issues. She spent time with focus groups to see what conservation issues were important to them. She found that people on Guam have grown used to the brown tree snake and are not as likely to be focused on it as other species. One of those species is the coconut rhinoceros beetle, which is harming coconut trees.

“People have a strong cultural connection to coconut trees, so they are very concerned with this, while they’ve lived without native birds for twenty to thirty years,” Gawel said.

INTERNATIONAL EFFORTS TO SAVE

THE MONARCH

By Barbara Pleasants

Monarch butterflies don't recognize national borders. For example, a female butterfly that began her life in Canada at the end of summer will migrate through the US to reach her winter roost on one of a few mountains in central Mexico. In early spring she will fly to Texas and lay eggs on milkweed plants. Subsequent generations will move north, breeding in the Midwest, the Northeast and Canada. Thus, conservation efforts require international collaboration.

The Trinational Monarch Conservation Science Partnership was established for this purpose with funding from the governments of all three of these countries. Dr. John Pleasants, Adjunct Associate Professor in EEOB, frequently participates in the group's meetings, most recently in Montreal, Canada and Morelia, Mexico. Participants present their research and discuss future directions for conservation efforts.

In Mexico, the main issue is preservation of the monarch's winter roost sites. These isolated mountain forests are threatened by climate change and illegal logging. Researchers are growing fir trees to revegetate logged areas and are also planting genetic variants at the appropriate elevation in

anticipation of climate change. For American and Canadian scientists, the monarch's breeding habitat is the major focus. Monarch caterpillars feed exclusively on milkweed plants, which have declined dramatically due to use of glyphosate herbicide on fields of genetically engineered glyphosate-tolerant corn and soybeans. The result has been a corresponding decline in the monarch population. Increasing the abundance of milkweeds is the key to preserving the monarch butterflies and many organizations are encouraging milkweed planting throughout the monarch's breeding range.

Scientists from United States and Canada are engaged in research evaluating methods to establish milkweeds on the landscape, determining which milkweed species are preferred by monarchs and observing the foraging behavior of the butterflies. These topics are the focus of research by Dr. Pleasants and others at Iowa State who are part of the Iowa Monarch Conservation Consortium (for more information, visit <https://monarch.ent.iastate.edu/>).



The Trinational Monarch Conservation Science Partnership meeting in El Rosario, Mexico in March of 2018. Photo taken at butterfly reserve.

A key to successful conservation is to engage ordinary citizens in all three countries in the conservation efforts. For Mexico that means engaging the local people in ecotourism as an alternative to logging. For the U.S. and Canada, it involves recruiting citizen scientists to monitor local populations throughout the breeding range. It also means encouraging homeowners, farmers and members of nature organizations to plant milkweed where they live. The love that people feel for the monarch butterfly motivates scientists and non-scientists alike, in different countries, speaking different languages (butterfly is *mariposa* in Spanish, *papillon* in French), to find a way to keep this species from further decline.

IOWA STATE REPRESENTATION CONTINUES TO GROW AT

SACNAS CONFERENCE

By David Ortiz

On Oct. 21, 2017, Bryan Juarez was recognized for giving the best graduate student oral presentation in Ecology/Evolutionary Biology at the Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) conference. The multidisciplinary, national SACNAS conference attracted more than 4,000 scientists from undergraduates to faculty and everyone in between. Hundreds of universities, several government agencies, and private tech companies traveled to Salt Lake City, Utah for the event.

In four years, the Iowa State SACNAS chapter has expanded to 20 active members. The goal of the organization is to promote the involvement of all students in science, technology, engineering, and math (STEM); helping students learn about research opportunities; and offering personal and professional development workshops during chapter meetings every two weeks.

This year the chapter sent eight students from the Departments of Ecology, Evolution and Organismal Biology and Mathematics as well as from the Environmental Science and Bioinformatics and Computational Biology interdepartmental programs. Six of

the students presented research in oral and poster presentations. Six Iowa State faculty members also attended the conference.

“As a Central American student I feel that I can represent and be supported as a Central American at SACNAS, as opposed to just being another generic Latino student at other conferences,” said Kevin Quinteros, doctoral student in genetics and genomics and SACNAS chapter secretary.

As the largest multidisciplinary and multiethnic STEM diversity organization in the country, SACNAS is an excellent place to find talented underrepresented minority scientists from undergraduates to postdocs. Several of ISU’s attendees were either recruited or have successfully recruited individuals to Ph.D. or postdoctoral positions while at the conference.

DANIELA FLORES

ELECTED TO SACNAS BOARD

By Barb McBreen

Daniela Flores is the first ISU graduate student elected to serve on the board of directors for the Society for the Advancement of Chicano/Hispanics and Native Americans in Science (SACNAS).

“The organization has been a huge driving factor in my career and I am excited to have a voice in shaping the future of an organization that has helped me so much,” said Flores, a doctorate student in interdepartmental genetics.

When Flores arrived at Iowa State she wanted to continue her involvement in SACNAS, so she and other graduate students started the SACNAS student chapter on campus. That was four years ago. Since then, she’s served as secretary and president of the club. Now she’s serving on the SACNAS board at the national level.

Flores begins her three-year term in January and will attend the annual national conference next fall in San Antonio.

GROVER HONORED FOR RESEARCH EXCELLENCE



The Iowa State University Office of the Senior Vice President and Provost office honored Dr. Corrinne

Grover with the Professional and Scientific Research Award in 2018. The award recognizes professional and scientific staff member for excellence in research.

Grover, an Associate Scientist with Dr. Jonathan Wendel's lab, is an internationally recognized plant genomics researcher. Grover juggles graduate students, postdoc and faculty research projects with her personal research. She has 35 peer-reviewed publications to her credit and is first author on 14. She has been a co-PI of two NSF grant projects, and she was named a

Postdoctoral Fellow by Cotton, Inc. These three awards total more than \$1 million.

Her scientific contributions are impressive in their breadth and depth. Grover has delved into the phylogenetics of the cotton genus, has surveyed evolution of genome size, and provided novel insights into the evolution of gene expression and transposable element content in polyploid cotton genomes. This award recognizes her boundless scientific curiosity and ability to guide complex projects to completion.

STUDENTS RECOGNIZED FOR EXCELLENCE

Amy Geffre received the Research Excellence Award, which recognizes student for outstanding research or creativity as seen in their theses or dissertations.

Kaitlin Barber, Justin Van Goor, Casey Judge, Sean Satterlee, Katie Thompson, Alex Walton, and LingSze Lee received the Teaching Excellence Award. This award recognizes and encourages outstanding achievement in teaching.



Amy Geffre, Justin Van Goor, Katie Thompson, Casey Judge, and LingSze Lee pose outside Bessey Hall. Photo by Jacki Hayes



HUFFORD RECOGNIZED AS RESPECTED LEADER ON CAMPUS

Five faculty in the College of Liberal Arts and Sciences (LAS) have received awards that recognize their excellence in research and their leadership and service in their fields. The awards are made possible through special donor support.

“The College of Liberal Arts and Sciences is fortunate to have generous alumni and friends who understand the critical role that superb faculty play for the reputation of the college and the success of our students,” said Beate Schmittmann, dean of the college.

Three faculty members received Dean’s Emerging Faculty Leaders Awards: Matt Hufford, assistant professor in ecology, evolution and organismal biology; Michael Young, assistant professor in mathematics;

and Kathleen Hilliard, associate professor of history.

The Dean’s Emerging Faculty Leaders Awards are funded by generous donations from members of the LAS Dean’s Advisory Council as well as LAS alumni to recognize early to mid-career LAS faculty members who are rising stars in their fields and are respected leaders on campus, across the nation and throughout the world.

Hufford was selected based on his research in plant biology, specifically the evolution and ecology of crops and their wild relatives, as well as his strong contributions to teaching and service. Hufford focuses especially on the evolution of maize and teosinte. Recently he received two collaborative

Dr. Matthew Hufford (front center) with his lab members, Aimee Schulz, Kelsey Bryant, Sarah Pedersen, Nancy Manchanda, David Hufnagel, Garrett Janzen, and Samantha Snodgrass.

grants from the NSF Plant Genome Research Program to map the genomes of 26 lines of corn and to evaluate the genetic basis of high elevation adaptation in corn. The research into corn genetics may uncover a wider diversity of genes for plant breeders and could lead to corn varieties with better yields and stress resistance.

In addition to the Dean’s Emerging Faculty Leaders Awards, Dr. Javier Vela, associate professor of chemistry, received the Cassling Innovation Award and Alan Wanamaker, associate professor of geological and atmospheric sciences, received the Trapp Innovation Award.



ATRIUM ART IN BESSEY

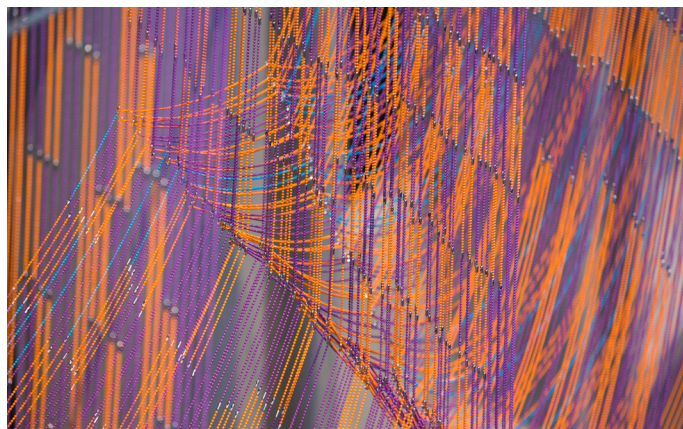
By Erin Rosacker

Bessey Hall, home to bioscience offices, labs and greenhouses, also is home to Iowa State's newest public artwork. The sculpture, with a working title ("Y in the Road") that is likely to change, features 6.5 miles of colorful, stainless steel ball chains suspended in the four-story atrium linking the addition to the original building. Designed and fabricated by Ball-Nogues Studio, Los Angeles, artists Benjamin Ball and Gaston Nogues embraced the biosciences with a conceptual representation of a phylogenetic tree -- a branching diagram that shows evolutionary relationships among species.

The sculpture is part of the Iowa Art in State Buildings program, which designates 0.5 percent of new construction and remodeling funds for public art. The 2017 Legislature repealed this requirement, but projects underway were grandfathered in.

Ball-Nogues Studio produced two sculptures for Iowa State's \$88 million combined biosciences facilities project -- one installed in the four-story Bessey addition (\$265,000) and another for the newly

constructed Advanced Teaching and Research Building (\$135,000). The ATRB artwork will be installed later this spring.



A close-up of the stainless steel balls which make up the sculpture now suspended in the Bessey Hall atrium. *Photo by Christopher Gannon.*

Above: Pat Webb of U.S. Erectors works to install the "Y in the Road" sculpture in the Bessey Hall atrium on Tuesday. *Photo by Christopher Gannon.*

WHERE ARE THEY NOW?

While a graduate student at Iowa State University, **Dr. Shyam Thomas** studied the spatial distribution of the invasive plant species, Purple Loosestrife (*Lythum salicaria L.*). After graduating in 2013, Thomas served as a postdoc in Matt Daugherty's lab at University of California Riverside. There, he worked on developing spatiotemporal models aimed at understanding the landscape-level dynamics of a recent insect invasion.

Currently, Thomas is a postdoc in Stephanie Melles lab at Ryerson University, Toronto. His current research involves the study of fish mercury pollution in inland lakes of Ontario. Thomas is developing geospatial visualization tools and spatial models that improve on current understanding of mercury contamination in sport fishes.



After receiving her Ph.D. in 2010, **Dr. Claudia Ceballos Fonseca** returned to her home country of Colombia. She now serves as an Associate Professor at the Veterinary Medicine School of the University of Antioquia.

Over the last seven years, she has worked on several research studies on reptiles, including reproduction, anatomy, and the thermosensitive period of the endemic Colombian river turtle *Podocnemis lewyana*, the natural history and phylogeography of the mud turtle *Kinosternon leucostomum*, and sex determination of the tortoise *Chelonoidis carbonarius*.



Dr. Andres Fuentes-Ramirez received his Ph.D. in 2015 working under Dr. Kirk Moloney. His dissertation focused on understanding the impacts of fire on arid shrublands in the U.S. southwestern deserts. Currently, he is a postdoc researcher in Universidad de La Frontera, Temuco, Chile.

His research interests include the ecology of fire in forest ecosystems, the ecology of invasive plant species, and spatial modeling as applied to human-disturbed ecosystems. His current research utilizes the forest fires of the China Muerta National Reserve as a natural laboratory for assessing their ecological impacts.



IOWA STATE UNIVERSITY

OF SCIENCE AND TECHNOLOGY

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MAKE A DIFFERENCE

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For more information about making a gift to EEOB or including ISU in your estate plans, please contact the College of Liberal Art and Sciences Development Office at 515-294-3607 or the College of Agriculture and Life Science Development Office at 515-294-9328.

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