



EEB's new home: the Biological Sciences Building, southern view of east atrium. Image: ©Bruce Damonte.

Biological Sciences Building brings EEB into 21st century

The changing sky reflects off the exterior of the three-towered, five-story, 312,000 square foot building. Finished with terracotta baguettes interspersed with reflective glass, the unique design can appear almost as an optical illusion to passersby. However, this is the very real new home for the Department of Ecology and Evolutionary Biology.

As EEB faculty, students, postdocs and staff moved just up North University Avenue to their new work home in phases throughout the spring, everyone started to adjust to this shiny, new reality. How will the move into the \$261 million Biological Sciences Building affect EEB's future? A large part of the answer is that the BSB facilitates a much more collaborative environment.

"It is exciting to have all the departments together for the first time ever," said Professor Deborah Goldberg, EEB's former associate chair for space and facilities. Sharing the new space are the Department of Molecular, Cellular, and Developmental Biology; the Museum of Paleontology faculty, students, and staff; teaching collections and some research collections for the Museums of Paleontology and Zoology and the Herbarium; and the completely renovated and state-of-the-art Museum of Natural History (reopens in April 2019).

A major feature of the new building is the shared lab environment. "It changes the way we are working, with greater interaction across labs – without losing interaction within labs. That's how modern science works," Goldberg added. "Many of the new faculty are especially excited about the move. They've grown up in this environment." As part of the move, five research neighborhoods were created that now comprise EEB: biodiversity; biogeochemistry; field biology; molecular biology and microbiology (aka MB²); and theory.

"As a new incoming faculty, I think the change is really great and that the timing is perfect with respect to the new cohort of faculty we have coming in together," said Jake Allgeier, assistant professor of EEB, who is part of the biogeochemistry neighborhood. "We are pretty united as an incoming group, and I think this move will help maintain this drive for a strong cohort bond and that this will feed well into the existing collegiality and integrative nature that the department has had for its history. I also think it is great for the students to be able to interact with one another with increased frequency. I think this bond is among the most important aspects for any department's success.



Photo credit: Dale Austin

Diarmaid Ó Foighil
Chair and Professor of Ecology and Evolutionary Biology
Curator, Museum of Zoology

Season's greetings from Ann Arbor! This is the Department of Ecology and Evolutionary Biology's 16th volume of *Natural Selections* and it differs from its predecessors in being a single-topic edition. Its focus is on our remarkable new home, the Biological Sciences Building (BSB), built over the past three years just north of Ruthven on the footprints of the former North Hall and Museums Annex buildings. I hope you enjoy reading about the BSB and its many attributes, as well as how we are settling in and adapting to our shiny, light-filled new work environment.

For those of you who remember taking classes and/or doing research in Kraus (built in 1915, the future home of the School of Kinesiology) or in Ruthven (built in the 1928, the future home of the U-M's central administration), the small number of BSB photographs included in this edition will give you some inkling of the scale of the change. Experiencing it in person, it feels as if we have passed through a radical metamorphosis – the building equivalent of transitioning from a caterpillar to a monarch butterfly. We are just emerging from our equivalent of a pupal stage (the unglamorous and somewhat fraught process of lab downsizing, moving and setup) into a wholly-changed work environment that will enable our program to take flight.

One of the more immediate benefits of the BSB is enhanced programmatic integration. For the first time in the history of our department all our faculty and their labs are in the same building and this is paying dividends. Many personnel report much higher levels of interaction and cooperation, a process facilitated by the predominance of shared lab spaces. I see this play out also in our shared administrative space where we interact daily with members of the other units moving into the BSB: our sister Department of Molecular, Cellular, and Developmental Biology, the Museum of Paleontology, the Museum of Natural History and the Biological Station.

Many people have worked hard on BSB planning over the years but none more than Deborah Goldberg, who is quoted extensively throughout the newsletter. As our founding and long-time chair, Deborah was centrally involved in the initial planning and, as our associate chair for research and facilities for the past three years, she oversaw every aspect of construction and the highly complicated process of moving our program. Thank you Deborah!

I want to briefly touch on a few other notable departmental happenings. The multi-year move of the Museum of Zoology collections to the Research Museums Center on Varsity Drive (home of the Herbarium since 2001) is finally complete. This has involved a significant upgrade in facilities (e.g., new shared molecular lab, enhanced cryopreservation facility, new micro-CT and X-ray instruments). Our graduate program is performing well, based on 2018 U.S. News & World Report rankings. We were ranked joint-sixth among the nation's top "Ecology and Evolutionary Biology" programs by peer assessment. The last time they released comparable evaluations for a biology specialty was in 2014 when the U-M placed 12th, so we seem to be heading in the right direction.

We are in the middle of a wave of change in faculty composition and our most recent recruits are Assistant Professor Fernanda Valdovinos and Associate Professor Hernán López-Fernández. Dr. Valdovinos is a theoretical ecologist whose work links next-generation models of ecological complexity with data from a variety of field and experimental systems. Dr. López-Fernández is an expert in Neotropical fish biodiversity and serves as our UMMZ curator of fishes. We also had three retirements involving long-serving faculty members: Paul Berry, Robyn Burnham and Paul Dunlap, but note that Berry and Burnham remain curators *emeriti* in the Herbarium.

I am sad to report the passing of Professor and Curator *Emeritus* Richard "Dick" Alexander on August 20, aged 88. A member of the National Academy of Sciences and former UMMZ director, Dick joined the U-M faculty in 1957. Trained as an entomologist, he contributed to many areas of evolutionary biology and introduced the first ever course in evolution and/or behavior at the U-M with his popular "Animal Evolution and Behavior." A prolific and influential writer and thinker, Dick was involved in developing the field of sociobiology. Together with his students, he studied the evolution of eusociality in insects and, famously, developed naked mole rats as a vertebrate model system for studies of social evolution. A rich and productive academic life lived to the full!

I invite you to stay in touch over the coming year using the many electronic portals to our departmental news and events, including our website (lsa.umich.edu/eeb), Facebook, Twitter, Instagram, EEBlog, YouTube channel and newsletter. If you are visiting Ann Arbor, feel free to drop in to see me at BSB 2244.

With my best wishes for a peaceful holiday season and a happy and prosperous new year!

Diarmaid Ó Foighil

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Students and faculty share conversation and laughs over doughnuts and coffee during a weekly gathering. L to R: Chau Ho, Elizabeth Feliciano, Khadijah Payne, Tom Duda, Siria Gamez. Image: Dale Austin.

Graduate students are essential for success and we want to make sure our students are well integrated with one another and happy.”

Fernanda Valdovinos, assistant professor of EEB, said, “I really enjoy having my colleagues so close. I’m next door to Aaron (King) and Stephen (Smith) and I’m coteaching with Annette (Ostling), so it’s very useful to have her so close. I’m going for coffee or water and I see her and we’re able to chat right away, without wasting time of emailing back and forth to find a time. I’ve seen a reduction of time sending emails to talk with somebody. I’d much rather enjoy talking directly with people than replying to emails.”

How lab sharing is implemented varies greatly across research neighborhoods. As an extremely diverse department with different work flows, each neighborhood will settle in to their own routines and processes.

Each tower floor houses a pair of neighborhoods, strategically placed together based on shared equipment and workflow similarities. “It’s a highly conceptual structure that expands on the individual lab,” Goldberg said. Many faculty could fit within multiple neighborhoods and to some extent, the new arrangement may change how people identify and expand their interactions. Goldberg recently heard two students from very different labs talking about working on a software analysis program together. “That’s the kind of thing that just happens naturally when you’re interacting more with each other.”

“I have interacted with more people in the department in a few weeks in the new building than in the six years before,” said Vincent Deneff, assistant professor of EEB, who is part of the MB² research neighborhood. “We held a one-day retreat with the neighborhood to share science and get to know each other at a personal and professional level, and discuss best practices in the new shared environment.

“Students come check in with me more frequently. There are definitely more interactions with other PIs (principal investigators) and students, for example during lunch in the shared kitchen area.” Deneff noted a more efficient use of space and resources as compared to the Kraus Natural Science Building.

Allgeier is enthusiastic about the increased interactions that the new space facilitates. “Already, and even during the summer months, I see and interact with so many more students, postdocs and faculty. I think this will increase the cohesiveness within the department and end up stimulating collaborations and creative thinking among labs.

“I am always excited about taking alternative and creative steps towards my research and having all my colleagues nearby will certainly facilitate alternative approaches to my work and, ideally, integrative collaborations,” Allgeier said. “For example,

“I have interacted with more people in the department in a few weeks in the new building than in the six years before.”

~ Vincent Deneff

Hernán López-Fernández and I have very different fundamental interests but having him nearby, along with the fish collections, I certainly foresee some collaborative work in the future.” López-Fernández is an associate professor of EEB and associate curator of fishes, Museum of Zoology.

BSB has higher quality facilities much more suited for modern science than the over 100-year-old Natural Science Building. The building seamlessly blends research, teaching and museums.



Benjamin Winger, assistant professor and assistant curator of birds, shown here teaching EEB 433 (Ornithology), appreciates the specimen-based classroom's flexible layout and technology, such as the ceiling telescope camera that projects a view of a small specimen on screen. Image: Teresa Pegan.

For example, “The facilities for plant growth are fantastic for those of us who experiment with plants or plant-insect interactions, far beyond anything we’ve had,” Goldberg said. There are multiple plant growth rooms, more controlled-growth chambers, and rooms for potting, soil and fertilizer storage, autoclaves and procedure rooms.

The aquatic facility is primarily used by MCDB currently, but there’s some capacity for expansion if EEB hires someone whose research would utilize this resource.

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Wonderful specimen-based classrooms and labs for teaching biodiversity are on the first floor. Classrooms feature computers with shared monitors and microscope views can be projected for the whole room to see. “I am excited to teach Diversity of Mammals in the new specimen-based classroom,” said Priscilla Tucker, professor and curator. “The classroom is

equipped with the technology to display microscopic images on large wall monitors and this will allow students to compare and contrast the finer points of mammalian skull and tooth morphology.”

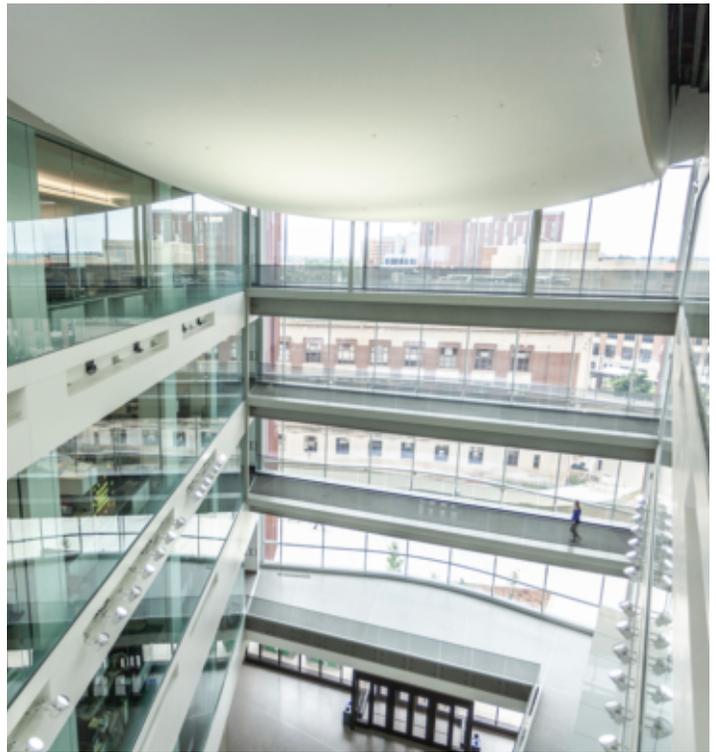
“We use over 600 specimens from the UMMZ to teach avian diversity in lab,” said Benjamin Winger, assistant professor and assistant curator of birds. “It’s important that the students can see the specimens up close, which is difficult in a classroom with a fixed layout. The flexible layout of the new room, and technology such as the ceiling telescope camera that can project a view of a small specimen onto a screen, makes it much easier to effectively use the specimens for teaching. I also like the new room because I can integrate lecture and lab material more fluidly.”

There’s an active learning classroom for teaching the large introductory biology courses. Active learning means that even in large classes, the focus is on students engaging with each other and more directly with material, rather than the classic “sage on a stage” style of lecturing, methods supported by the literature as being more effective. An example is that students answer instructor questions using clickers that provide immediate feedback, usually projected in aggregate on the screen. As a result, instructors can modify how they’re explaining material, if needed. Moveable tables, chairs and computer monitors allow for easy reconfiguration to enable students to collaborate. In addition, BSB is located next to the

Undergraduate Science Building, where the rest of EEB's undergraduate teaching takes place, allowing for greater integration with the Program in Biology.

The BSB towers are connected by walkways overlooking five-story glass enclosed atriums with natural light copiously spilling into the east atrium. Prehistoric whale skeleton fossils of a *Basilosaurus* and *Dorudon* "swim" overhead between towers. Building residents have an exciting front row view as the Museum of Natural History begins to take shape.

The integration with the Museum of Natural History facilitates classes working with the museum and its resources. Additionally, museum visitors will be able to view ongoing research in one of the research neighborhoods through a glass partition. "There's no question it's exciting for the public to see science at work. Not surprisingly, the researchers are a bit concerned about how it will work," said Goldberg. Needs will



Walkways connecting the towers with views into labs from the 5th floor west atrium, looking south toward the Ruthven Building. Image: Bob Foran.



Rachel Cable, research lab technician in the lab of Melissa Duhaime, assistant professor, works on marine viruses sampled from Antarctic waters. Image: Bob Foran.

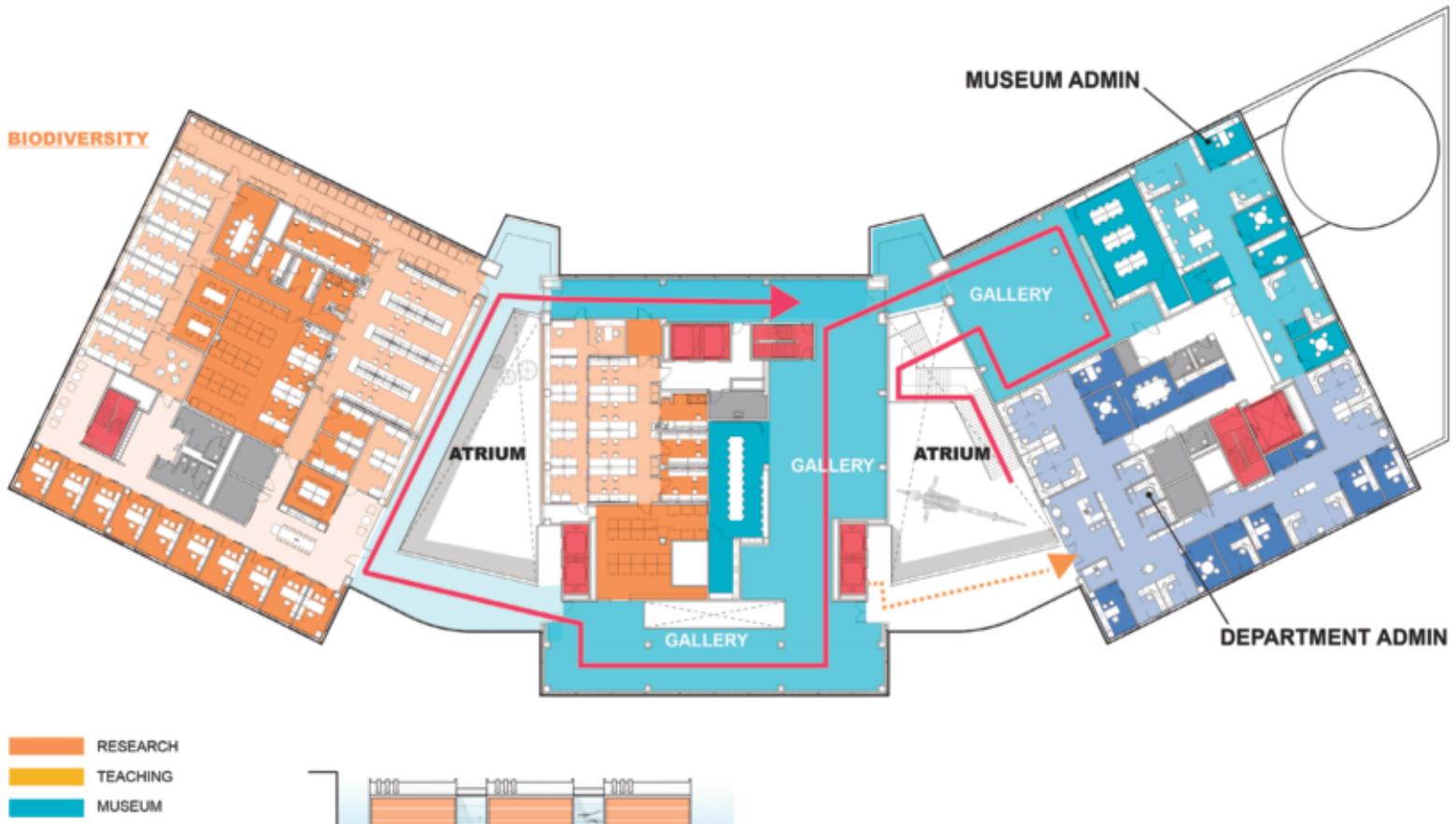
be balanced and interesting exhibits and displays that explain ongoing research and its real world implications are being developed for those areas.

Although the bulk of the wet and dry collections from the Museum of Zoology moved to the Research Museums Center on Varsity Dr. in Ann Arbor, there is substantial space for teaching and research collections (wet and dry) in BSB. Effective ways to transport people between campus and RMC, which is about 15 minutes south of campus, are in place, including a regular shuttle service.

"The shuttle gets students to the RMC where they interact with expert staff and work with any of the nearly 15 million natural history specimens that are housed there," said Professor Christopher Dick, curator and associate chair for museum collections. "The collection facilities at BSB permit faculty and students to seamlessly integrate campus activities and specimen based research and teaching."

As part of the move, five research neighborhoods were created that now comprise EEB: biodiversity; biogeochemistry; field biology; molecular biology and microbiology (aka MB2); and theory.

Interaction spaces are located throughout the BSB for faculty, students and staff, in stark contrast to the Natural Science Building. Places to sit and talk were limited in Nat Sci, evidenced by students often sitting on the floor and on staircases, especially outside the auditorium.



Biological Sciences Building floorplan of level two. Drawing: Ennead Architects.

“When we tried to keep our office or lab doors open, the fire marshal would make us close them. There was no way to make it a welcoming environment.” The new building is full of places to sit and talk and writable surfaces, such as whiteboards and interior glass walls, abound. For the first time, EEB will be able to hold seminars and symposiums in the same building where much of the EEB community works, facilitating interactions before and after events.

Terrence McDonald was the driving force behind bringing the building to fruition when he was dean of the College of Literature, Science, and the Arts. He is currently the director

Goldberg recently heard two students from very different labs talking about working on a software analysis program together. “That’s the kind of thing that just happens naturally when you’re interacting more with each other.”

of the Bentley Historical Library, and an Arthur F. Thurnau Professor of History.

The design process began in 2013 with meetings between

faculty and architects to discuss needs. Goldberg pointed out that everything doesn’t stand still after a building is designed. With new faculty hires, new equipment and assorted other requirement changes, designs had to be updated.

Goldberg knows the building intimately. She began working on BSB when she was EEB chair and has been the department’s point person since. “I’ve been the liaison for architects, for everything about the design and the move. I feel like I could do a much better job the next time we move into a new building,” she joked. “I’ve learned a lot about architecture and code. I really enjoyed the design phase; we’re now in the detail and logistics phase, which is just as important, but somewhat less fun.”

Goldberg is most excited about “little things, but they’ve driven me crazy for 35 years. We had no cold rooms. We had nowhere to put samples until we got them processed. So, samples would get full of fungus. You come in from the field and there’s nowhere to wash waders and equipment. We’d bring them in and wash them in a lab sink. Now, we have a field storage room where we can wash equipment.” While she said BSB was primarily designed as a lab building, there are features that make it better suited for field work than previously.

The Natural Science Building did not have the necessary infrastructure or sufficient air handling capacity for the modern day needs of EEB or MCDB. On the top floors, the weight of equipment was a concern. The use of space was inefficient



Meagan Simons, EEB graduate student, researches wasp behavior in the lab of Professor Elizabeth Tibbetts. Image: Bob Foran.

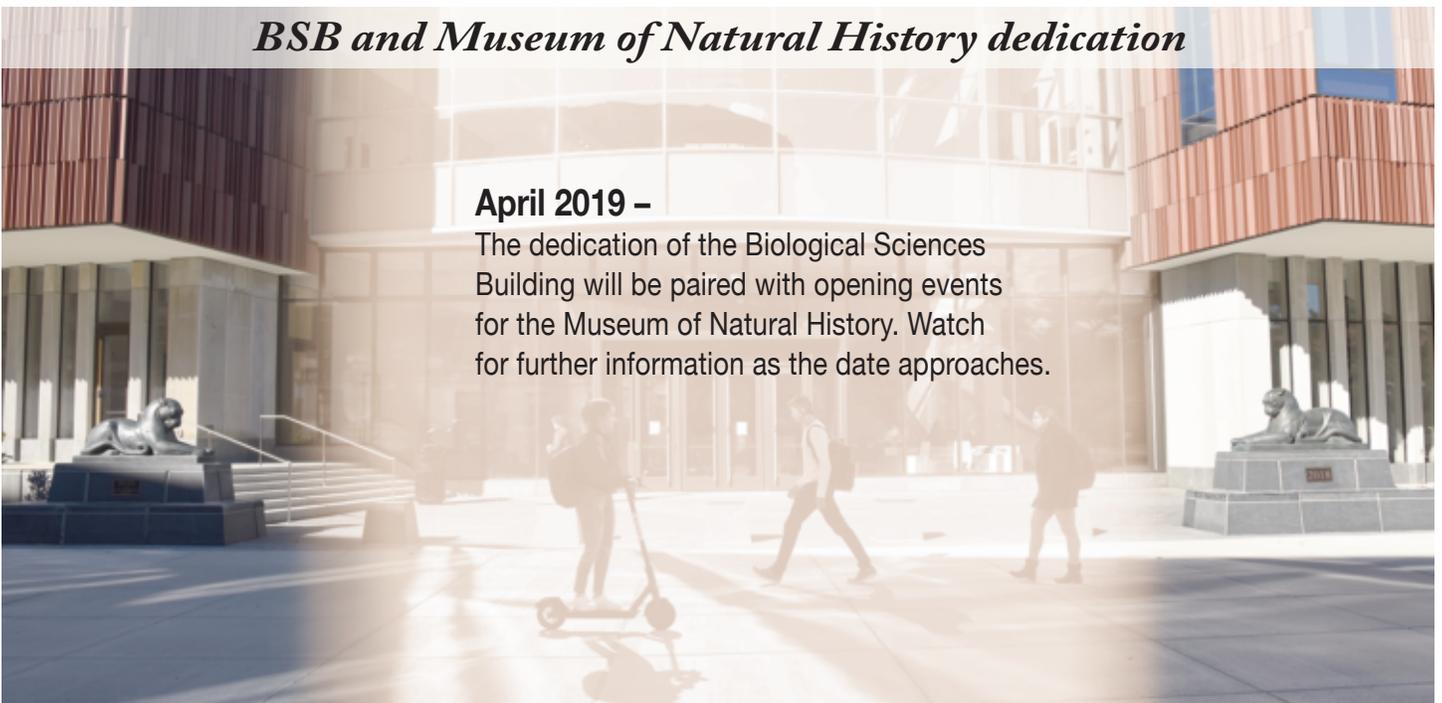
for research programs that naturally ebb and flow. Getting researchers enough space was a constant struggle because of fixed walls. The Natural Science Building will be renovated for the School of Kinesiology. The Ruthven Museums Building will be preserved and renovated to house classrooms, U-M administration and the Office of the President.

As each neighborhood moved in to the BSB from April through July, EEB held a series of neighborhood warmings to bring the EEB community together in the new space. It's a sea change for the department but it would appear the tides are turning for an even brighter and more promising future. 🍃

BSB and Museum of Natural History dedication

April 2019 –

The dedication of the Biological Sciences Building will be paired with opening events for the Museum of Natural History. Watch for further information as the date approaches.



The pumas have migrated about 100 meters to BSB from Ruthven. Image: Dale Austin

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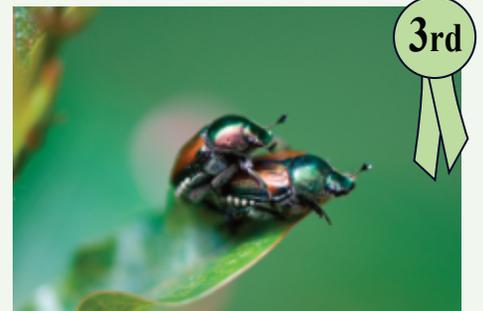
A venomous frog hops to first place EEB Honorary Photographer at Large Contest 2017



Anat Belasen



Dan Rabosky



Marc Ammerlaan

1st place: Anat Belasen “More venomous than a pitviper (yes, venomous),” Bahia, Brazil

2nd place: Dan Rabosky “Mushrooms in a floodplain,” lowland Amazonian rainforest, southern Peru

3rd place: Marc Ammerlaan “Spoon in June,” Ann Arbor, Mich.

Honorable mentions:

Rumaan Malhotra “EEB Ph.D. students enjoy a starry sky at Sleeping Bear Dunes, Mich.”

Kristel Sanchez “I scratch you, you scratch me,” Galapagos Islands

Rudolph von May “Vernal pool, San Joaquin Valley, Calif.”

Honorable mentions



Rumaan Malhotra



Kristel Sanchez



Rudolph von May

The 10th annual photo contest was held in memory of David Bay, “photographer at large” for EEB and its predecessor departments for 34 years. View all of the 2017 photos: myumi.ch/abb05. The 2018 contest is underway.