



MUSEUM *of*
COMPARATIVE
ZOOLOGY



HARVARD UNIVERSITY

ANNUAL REPORT

2024 • 2025

ABOUT THE MCZ

The Museum of Comparative Zoology at Harvard University is a global center for research and education focused on the biology and evolution of animal life. The MCZ collections comprise approximately 21 million extant and fossil invertebrate and vertebrate specimens, which are a focus of research and teaching for the MCZ, Harvard, and students and researchers around the globe.

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DIRECTOR'S MESSAGE

I write to you this year with heartfelt gratitude for the tremendous support you have shown our beloved institution during a year full of challenges for both our University and the Museum.

Never before have I felt such a threat to our mission of teaching, research and stewardship of our collections. Federal funding that has long supported our research and specimen care is at risk, and the possibility of future grants is uncertain. The MCZ therefore continues to rely on its strong endowment to ensure our mission for the greater community is not severely impacted.

We are also facing additional challenges, including uncertainty regarding the future of the Concord Field Station and research spaces for our faculty-curators in the MCZ Laboratories building. University-wide, well-justified hiring freezes are beginning to affect some of our collections where we have vacancies in curatorial staff and curator positions. Many obstacles lie ahead in the coming years, but I believe these difficulties will ultimately bring our community even closer together.

Despite these challenges, there is also much to celebrate. We are delighted to welcome Professor of Organismic and Evolutionary Biology Mandë Holford to the MCZ. Mandë brings groundbreaking research on animal venom, particularly among molluscs, and strong connections to other University departments. Her large research group will be based at the Biological Laboratories, where a new cephalopod aquatic facility has recently been established. Additionally, just days before the University announced a hiring freeze, Caroline (Carrie) Albertin accepted an appointment as Assistant Professor in the Department of Organismic and Evolutionary Biology,

bringing her cutting-edge research on the evolution and embryogenesis of cephalopods to the MCZ. Both Mandë and Carrie will serve as curators in Malacology.

The MCZ continues to fulfill its core mission of bringing new specimens to our campus and inviting researchers from around the world to study our collections. Regrettably, this year we must pause some of our programs for international scholars due to uncertainties in the visa process and threats of visa cancellations for Harvard researchers. This difficult decision will allow us to focus our resources on supporting those already here or about to arrive, including our 2025 cohort of Biodiversity Postdoctoral Fellows.

Once again this year, our curatorial staff has been outstanding in facilitating research visits, as well as expanding and digitizing our collections. The dedication of everyone in the MCZ to behind-the-scenes activities—such as imaging, data entry, permitting and accessions—is remarkable. Our MCZ family also continues to grow: Curatorial Associate in Malacology Jennifer Winifred Trimble and Curatorial Associate in Ornithology Jeremiah Trimble welcomed baby Winnie this year, who is already debating whether molluscs or birds will become her passion!

Finally, I wish everyone a happy and productive year ahead, focused on the things that truly matter and those within our control. Please reach out to your closest colleagues and friends if you need support.



Melissa Aja

Gonzalo Giribet
Director

On the cover: A googly-eyed glass squid (*Teuthowenia pellucida*) collected in mid-water at around 350 meters near South Georgia. Photo by Gonzalo Giribet

Inside cover: Open drawers of shell specimens from the Malacology collection. Photo by Juan Giribet



COLLECTIONS: BACK TO THE FUTURE

Biological specimens are like time capsules, a snapshot of each organism's existence in its own time and space. Scientists strive to unlock their secrets, using increasingly sophisticated technologies to tease out insights about their anatomy, chemistry, genomics, behaviors, environment and evolution.



Juan Giribet (all)

The Museum of Comparative Zoology's collection of natural history specimens is made up of 21 million specimens across the major collections of Entomology, Herpetology, Ichthyology, Invertebrate Paleontology, Invertebrate Zoology, Malacology, Mammalogy, Ornithology and Vertebrate Paleontology. Many of these collections date back to the founding of the MCZ in 1859, the same year Charles Darwin published *On the Origin of Species*. In fact, the Invertebrate Paleontology collection contains a fossilized sand dollar collected by Darwin himself in 1834. Some specimens were acquired even earlier, with a number of dried fish—collected in the late 1700s—still in the MCZ's care.

These research collections have been built steadily over the years by their curators, adding specimens through field research and accession in order to assemble some of the most extensive and scientifically valuable biological collections in the world, which are now being used in ways that collectors from the 1800s couldn't even imagine.

Just as research technologies have advanced over the years, so have technologies for collections. As genetic and genomic studies became an increasingly important part of biological research, the MCZ's Cryogenic Collection was created to house the genetic resource holdings across the MCZ extant collections, including frozen tissues, chemically preserved tissues and/or associated extracts.

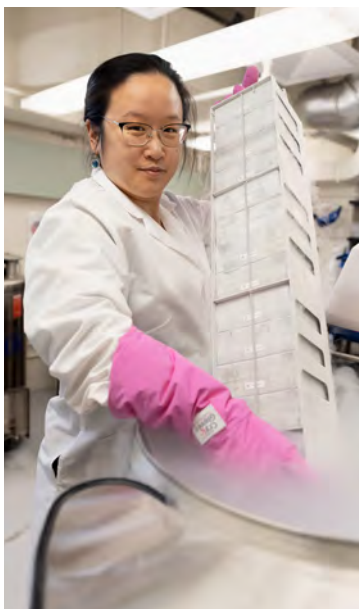
And decades of efforts by the Collections staff have made MCZbase, the Museum's collections database, a robust research resource, with millions of specimen records remotely accessible and freely available to scientists worldwide. Many of these records include photos of live specimens, images of preserved specimens, video, sound, associated publications or direct links to GenBank, a database for genetic resources.

"I want the MCZ to be welcoming and accessible to all," says Director Gonzalo Giribet. "The specimens are not ours, really, we're just taking care of them. They're specimens for everyone to see and use and study."

Research with the MCZ Collections: Case Study, Ornithology

When most people consider collections research they might think of the discovery of new species, and that is a common use of the collections. In academic year 2022–2023 alone, 50 new species were described using specimens from different MCZ departments. And every year, the MCZ awards 20 to 30 Ernst Mayr Travel Grants to researchers from around the world so that they can work on neglected taxa or undescribed species found in natural history collections around the globe.

However, biological specimens are useful in many more areas of scientific inquiry, as illustrated by one of our collections, Ornithology.



“The birds in the MCZ’s Ornithology collection are commonly used by scholars to study their anatomy,” says Curator Scott V. Edwards, “but their tissues also function as a way to understand the world in which they lived, and their DNA can help us understand how they evolved.”

For example, analyzing chemical compositions in historical specimens can help researchers assess environmental conditions, trends and impacts. To evaluate the rise in mercury levels over time, **researchers analyzed mercury levels in feathers of the Museum’s specimens of the Black-Footed Albatross**, collected from 1880 to 2002, to correlate them with emissions from increasing industrialization.

Genetic information extracted from museum specimens can also provide crucial insights into the genetic history of species and offer clues about evolutionary processes and adaptations. In a recent study, researchers in the Edwards lab constructed a **House Finch pangenome**—a complete collection of all the variations found in a population—based on the DNA of 16 specimens in the collection, leading to new insights of how the bird co-evolved with a pathogen and offering clues about how other animals, even humans, might genetically respond to infectious diseases over time.

Bones can even be used to study species and their evolution millions of years after they went extinct. Researchers used bones of extant birds in the collections of the MCZ and other museums to **study the relationship between furcula (wishbone) shape and flying style**, and then analyzed the fossilized furculae of extinct birds from the Mesozoic era to infer how they flew, noting that some of their flying styles could be rather unfamiliar to us now.

And research using natural history specimens can even inspire the design of solutions with the potential to positively affect our daily lives.

A study of a unique bird’s nest constructed of steel wires in the Ornithology collection—made by pigeons near a construction site—was used to help investigate how such seemingly fragile tangles of twigs can remain remarkably stable despite wind and other disturbances, offering insights for designs in material science.



The Future of the Museum’s Collections

It is imperative to maintain the entirety of the MCZ collections—from the largest fossils to the tiniest insects and invertebrates to frozen tissues for genetic sampling—for future researchers employing as-yet-unknown technologies to address societal needs we can’t yet anticipate.

Grant funding from U.S. government agencies has made possible decades of research, collection facilities upgrades and improvements in specimen housing and storage, plus many of the digitization projects that have helped build MCZbase into such a valuable scientific resource.

We can just hope that research and collections-related federal grants continue to support our mission.

“The MCZ remains committed to serving as the steward of these important collections while striving to provide broader access to our data and specimens, so they can be studied and enjoyed by as many people as possible,” says Director Giribet.



FACULTY-CURATOR PROFILES

Kris Snibbe/Harvard University



Scott V. Edwards

*Professor of Organismic & Evolutionary Biology
Alexander Agassiz Professor of Zoology
Curator in Ornithology Chair, Department of Organismic & Evolutionary Biology*

Prof. Edwards' research focuses on the evolutionary biology of birds and related species, combining field,

museum and genomics approaches to understand the basis of avian diversity, evolution and behavior. Current projects in the Edwards lab use genomics technologies to study the evolution of flightlessness and other traits in birds, phylogeography and speciation in Neotropical and Australasian birds, and the genomics of host-parasite coevolution between House Finches and a recently acquired bacterial pathogen, *Mycoplasma*.

Brian D. Farrell

*Monique & Philip Lehner Professor for the Study of Latin America
Professor of Organismic & Evolutionary Biology
Curator in Entomology*

Prof. Farrell's research is broadly concerned with the evolution of ecological interactions between host plants and animals and their parasites, pests and pathogens, such

as insects and other tiny consumers. His current projects include applying comparative genomics to speciation and phylogenetic studies of associated species of beetles and plants, documenting biodiversity in the Dominican Republic, and repatriating digital information from scientific specimens of insects and fossils in museums to their countries of origin. He is working on bringing together ways of measuring biophilia for a book project.



Casey Dunn



Gonzalo Giribet

*Professor of Organismic & Evolutionary Biology
Alexander Agassiz Professor of Zoology
Curator in Invertebrate Zoology
Acting Curator in Malacology
Director, MCZ*

Prof. Giribet's primary research focuses on the evolution, systematics and biogeography of invertebrate animals,

including biodiversity discovery as well as genomics. Current projects in the Giribet lab include a study to characterize the radiation of velvet worms in the Neotropics and exploring techniques to use degraded DNA from old museum specimens in phylogenomics and population genomics. Ongoing research focuses on evolution of a diversity of terrestrial arthropod lineages, including arachnids and myriapods, as well as evolution of molluscs and several marine invertebrates.

Hopi E. Hoekstra

*Edgerley Family Dean of the Faculty of Arts & Sciences
C.Y. Chan Professor of Arts & Sciences
Xiaomeng Tong & Yu Chen Professor of Life Sciences
Curator in Mammalogy (on leave)*

Prof. Hoekstra combines field and laboratory work to understand the evolution of mammalian diversity. Her research focuses on the genetic basis of morphological and behavioral variation, primarily in rodents, identifying both the evolutionary processes and the molecular mechanisms responsible for traits that help organisms survive and reproduce in the wild. Research in the Hoekstra lab integrates ecological, behavioral, genetic, developmental and neurobiological approaches. She is currently the Edgerley Family Dean of the Faculty of Arts and Sciences.



Kris Snibbe/Harvard University





Mandè Holford

*Professor of Organismic & Evolutionary Biology
Alexander Agassiz Professor of Zoology
Curator in Malacology (incoming July 2025)*

Prof. Holford’s research demonstrates the scientific path from molluscs to medicine—examining how venoms evolved, developed and function over time, and how we

can use this knowledge as a roadmap for discovering and characterizing peptide natural products with therapeutic potential. Her work combines scientific research, education and diplomacy to understand marine biodiversity and transform this knowledge for the benefit of nature and humanity. She is cofounder of Killer Snails and 2030STEM, two initiatives focused on advancing K–12 STEM education and the professional careers of underrepresented STEM practitioners across sectors.



Javier Ortega-Hernández

*Associate Professor of Organismic & Evolutionary Biology
Curator in Invertebrate Paleontology*

Prof. Ortega-Hernández’s research focuses on the evolution of metazoans that appeared and diversified during the Paleozoic Era. His group specializes in the study of exceptionally preserved

Cambrian and Ordovician fossil biotas around the world, with interests in the morphology, ecology, phylogeny and development of invertebrate animals. The lab combines collection and fieldwork-based paleontology with cutting-edge imaging and analytical techniques to obtain new data from key fossil specimens, test macroevolutionary hypotheses through deep time, and better understand the origin of the major animal groups that have shaped the biosphere for more than 500 million years.

George V. Lauder

*Henry Bryant Bigelow Professor of Ichthyology
Curator in Ichthyology
Acting Curator in Herpetology*

Prof. Lauder’s research focuses on the biomechanics of fishes and the development of robotic models for studying aquatic locomotion. Using mechanical systems to understand vertebrate structure and function

allows controlled studies of how changes in structure affect performance, and provides inspiration for the design of biomimetic devices. His current studies focus on the structure and function of shark skin and other fish surface structures, shark and ray sensory systems, and research with various robotic fish models. Additional broad interests include biological fluid mechanics and theoretical approaches to the analysis of form and function in organisms.



Melissa Aja

Naomi E. Pierce

*Sidney A. & John H. Hessel Professor of Biology
Curator in Lepidoptera*

Prof. Pierce’s research focuses on behavioral ecology and symbiosis, particularly the coevolution between plants, pathogens and herbivores, and interactions between ants and

other organisms. Her laboratory integrates approaches from phylogenetics, ecology, behavior, genomics and comparative methods to investigate reciprocal adaptations and patterns of species diversification. Recent work has explored the extent to which insects perceive and use signals in the near-infrared, and how the evolution of multimodal sensory systems has influenced diversification of pollination systems and symbioses between lycaenid butterflies and ants.

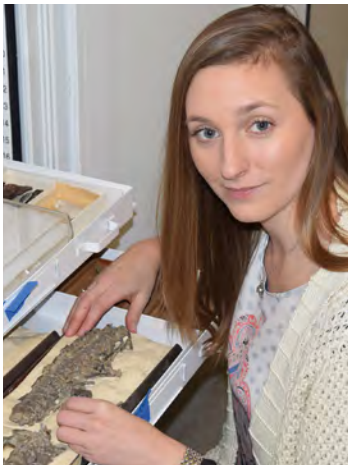


Isabella Kirkland



FACULTY-CURATOR PROFILES

Paul Whatmough



Stephanie E. Pierce

Professor of Organismic & Evolutionary Biology
Alexander Agassiz Professor of Zoology
Curator in Vertebrate Paleontology
Acting Curator in Mammalogy

Prof. Pierce's research is focused on major morphological and ecological transitions in vertebrate evolution

through an examination of the fossil record. Her work spans almost all vertebrate groups, from the earliest tetrapods to emerge onto land through to modern-day amphibians, reptiles and mammals. Studies in the S. Pierce lab tend towards transformation of the musculoskeletal system, including feeding and locomotion, with particular attention on the link between form and function across macroevolutionary timescales.

Mansi Srivastava

Professor of Organismic & Evolutionary Biology
Curator in Invertebrate Zoology
Co-Chair, Department of Organismic & Evolutionary Biology (incoming July 2025)

Prof. Srivastava's research focuses on understanding the evolution of animal development and regeneration. Her group utilizes the three-banded panther worm, *Hofstenia miamia*, which she has developed as a new acoel model system. Acoels represent an understudied phylum that is distantly related to other well-studied regenerative species, which allows her group to study genetic mechanisms from a comparative perspective. Current projects in the lab range from identifying gene regulatory networks for regeneration to determining the embryonic origins of pluripotent stem cells to understanding the evolution of centralized nervous systems.



Melissa Aja

MCZ History

The Great Auk (*Pinguinus impennis*) is a well-known example of human-caused extinction. Closely related to the Razorbill (*Alca torda*), this large, flightless diving bird once numbered in the millions across the North Atlantic, breeding on islands off Newfoundland (including Funk Island), Iceland (especially Eldey Island), and Scotland, and it was even found as far south as Florida and the Mediterranean. Although it had been hunted for food since prehistoric times, intensive hunting by European seamen in the 16th century, followed by commercial hunting for feathers, decimated Great Auk populations across their range. The resulting rarity made Great Auk specimens and eggs extremely desirable for private and institutional collections.

The last documented pair was captured on Eldey Island in June 1844, with no reliable sightings afterward, all before the MCZ was founded. Nevertheless, the Museum holds 25 Great Auk accessions—including skins, skeletons, eggs and numerous skeleton fragments—mainly from Funk Island, with one from Eldey.

Genetic studies using specimens preserved in multiple museums have shown that the Great Auk populations were healthy and diverse, indicating that human hunting alone likely drove the species to extinction. This teaches us that even species with abundant and healthy populations can be vulnerable to intense and localized exploitation in their nesting grounds. It also shows that even if collectors and museums contributed to the extinction of a species, the specimens can potentially be used to better understand—and hopefully prevent—future extinctions. Museum specimens are thus extremely valuable genetic repositories of past biotas that we must continue to steward, whatever the cost.



Juan Giribet

Great Auk accessions in the MCZ Ornithology collection



EMERITUS PROFILES



Andrew A. Biewener
Charles P. Lyman Research Professor of Biology
Charles P. Lyman Professor of Biology, Emeritus

Prof. Biewener studies the biomechanics and neuromuscular control of animal movement on land and in the air. His goal is to understand general principles that govern the biomechanical and physiological design

of vertebrate animals related to movement in natural environments, work with engineers to develop bio-inspired robotic designs, and develop improved neuromuscular models for treating human movement disorders. He served as director of the Concord Field Station from 1998 to 2024 and as chair of the Department of Organismic and Evolutionary Biology from 2001 to 2010. He is a Fellow of the American Association for the Advancement of Science.

A. W. "Fuzz" Crompton
Fisher Professor of Natural History, Emeritus

Prof. Crompton was the director of the MCZ from 1970 to 1982, having served as director of both the Peabody Museum of Natural History at Yale University and the South African Museum in Cape Town. His primary research

interests include the origin and evolution of mammals, functional anatomy, and neural control and evolution of feeding in recent and fossil vertebrates. Prof. Crompton received two Guggenheim fellowships for his research on vertebrate paleontology and functional morphology, and in 2011 received the Romer-Simpson Medal for lifetime achievement from the Society of Vertebrate Paleontology.



Justin Ide



James Hanken
Research Professor of Biology
Professor of Biology, Emeritus

Prof. Hanken utilizes laboratory-based analyses and field surveys to examine morphological evolution, developmental biology and systematics. Active areas of research include the developmental basis of morphological novelty and life-history

evolution, the systematics and evolution of Neotropical and Southeast Asian frogs and salamanders, and collections-based digital imaging. Together with students, postdoctoral fellows and other collaborators he has discovered and formally described more than 45 species of living amphibians. He came to the MCZ in 1999 and served as director from 2002 to 2021. His current work is supported by the U.S. National Science Foundation.

Robert M. Woollacott
Professor of Biology, Emeritus

Robert M. Woollacott is a professor of biology emeritus. He joined the Harvard faculty in 1972 and retired in 2018. Prof. Woollacott is the founding chairman of the Department of Organismic and Evolutionary Biology.

His focus is human impact on life in the sea.



Catherine Weisel



COURSES LED BY FACULTY-CURATORS

Academic Year 2024–2025



Javier Ortega-Hernández

OEB 56: The History & Evolution of Life on Earth

Organismic & Evolutionary Biology

OEB 10: Foundations of Biological Diversity

Brian D. Farrell, Mansi Srivastava (and Ognenka Avramovska, Elena Kramer, Anne Pearson)

An integrated approach to the diversity of life, emphasizing how chemical, physical, genetic, ecological and geologic processes contribute to the origin and maintenance of biological diversity.

OEB 56: The History and Evolution of Life on Earth

Javier Ortega-Hernández (and Nadja Drabon)

Investigation of the ways that Earth and life interact, focusing on the biogeochemical cycles of major elements, providing a framework for interpreting the history of life reconstructed from fossils and phylogeny.

OEB 125: Genome Analysis, Ecology and Evolution

Scott V. Edwards

A survey of theory and applications of DNA technologies to the study of evolutionary, ecological and behavioral processes in natural populations. Topics include the evolution of genes, genomes and proteins;

the neutral theory of molecular evolution and molecular clocks; population genomics and phylogenetic principles of speciation and phylogeography; metagenomics of microbial communities; relatedness and behavioral ecology; molecular ecology of infectious disease; and conservation genetics.

OEB 207: The Fishy Aspects of the Human Body

Stephanie E. Pierce

Exploration of how the human body evolved through readings, discussions and hands-on activities with MCZ specimens. By touching on anatomy, development and function, students discover how different parts of the human body can be traced back to creatures that lived eons ago.

OEB 213: Macroevolution in Deep Time

Javier Ortega-Hernández

Examination of how processes acting through deep time affect fundamental biodiversity patterns, including topics such as the origin of animals, the rapid diversification of major clades, and the impact of extinction.



Brian Farrell

OEB 10: Foundations of Biological Diversity



Freshman Seminar

FRSEMR 22T: Why We Animals Sing

Brian D. Farrell

Investigates the sounds and structures of different kinds of acoustic animals—including birds, mammals, frogs and insects—and the different kinds of habitats in which they produce their songs and calls.

Life Sciences

LIFESCI 1B: An Integrated Introduction to the Life Sciences: Genetics, Genomics, and Evolution

Scott Edwards (and Andrew Berry, Monica Boselli, Maria Ostapovich)

This course takes an integrated approach, showing how genetics and evolution are intimately related, together explaining the patterns of genetic variation we see in nature and how genomics can be used to analyze variation.

LIFESCI 2: Evolutionary Human Physiology and Anatomy

George V. Lauder, Stephanie E. Pierce (and Daniel E. Lieberman, Joanne Clark Matott, Andrew Yegian)

Explores human anatomy and physiology from an integrated framework, combining functional, comparative and evolutionary perspectives on how organisms work.

Graduate Courses of Reading & Research

OEB 306: Invertebrate Paleobiology and Evolution

Javier Ortega-Hernández

OEB 310: Metazoan Systematics

Gonzalo Giribet

OEB 320: Biomechanics and Evolution of Vertebrates

George V. Lauder

OEB 321: Evolution of Regeneration and Development

Mansi Srivastava



Melissa Aja

OEB 207: The Fishy Aspects of the Human Body

OEB 323: Advanced Vertebrate Anatomy

Stephanie E. Pierce

OEB 341: Coevolution

Brian D. Farrell

OEB 362: Research in Molecular Evolution

Scott V. Edwards

FRSEMR 22T: Why We Animals Sing



Brian Farrell



HIGHLIGHTS OF FACULTY-CURATOR GRANTS

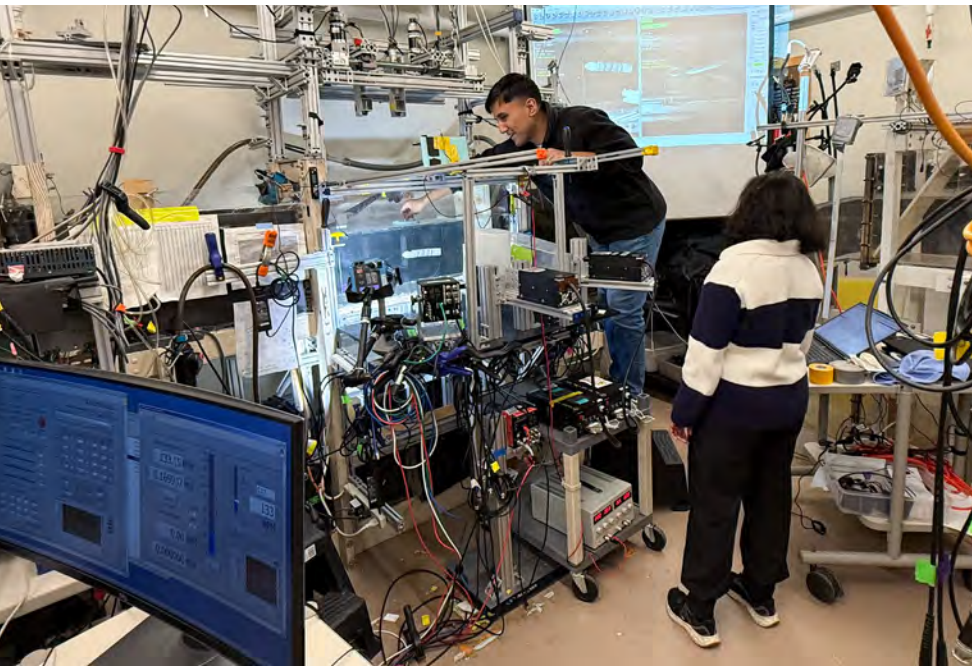
In addition to their teaching responsibilities, curatorial duties and research efforts, MCZ faculty-curators obtain grants to lead long-range, often multi-institutional research projects.

“Faculty-curator grants constitute the basis for a large component of the research happening in the MCZ,” says Director Giribet. “They showcase the cutting-edge nature of the work undertaken by our faculty-curators and their students and postdocs. The competitive grants highlighted here are examples of such diverse research on biologically inspired robot design, whole-body regeneration and innovative approaches to STEM education. However, there is uncertainty about federal funding in areas of inquiry close to the museum’s mission.”

forms of fluid-structure interaction for underwater locomotion. Fish are intelligent swimmers that embody this intelligence in their structure and movements and the ability of their neural systems to utilize sensory information to adjust their swimming. This allows them to navigate challenging hydrodynamic conditions. Despite recent advances, current robotic fish remain limited to swimming in calm water or slow laminar flows, failing to match the capacities and performance levels of their biological counterparts.

This research proposes a pioneering approach that utilizes artificial evolution, reinforcement learning, and 3D-Printing and Electronic Packaging (3DPE) to co-design the body and control of modular robotic swimmers, with the ultimate goal of enabling novel functions such as stabilizing in turbulent hydrodynamic conditions, navigating towards wakes of underwater objects, and performing stable adjustments to fluid flow while minimizing energy expenditure through dynamic adjustments to the robot’s body stiffness and shape.

Specifically, this research will first modularize fish-inspired robotics to create a Modular, Mutational, Morphing Underwater Robot (MuBot) design space. Next, asynchronous evolution will be performed directly in the physical MuBot design space for evolving body morphologies and learning motor control programs for modular swimming behaviors such as rapid turning, acceleration, steering, and forward or backward swimming. The large-scale robot evolution in physical space will be made possible by innovating 3DPE for rapid design and automatic fabrication of MuBot modules. Finally, selected prototypes from the evolved MuBot population will be equipped with hydrodynamic pressure sensors and then undergo reinforcement learning for feedback



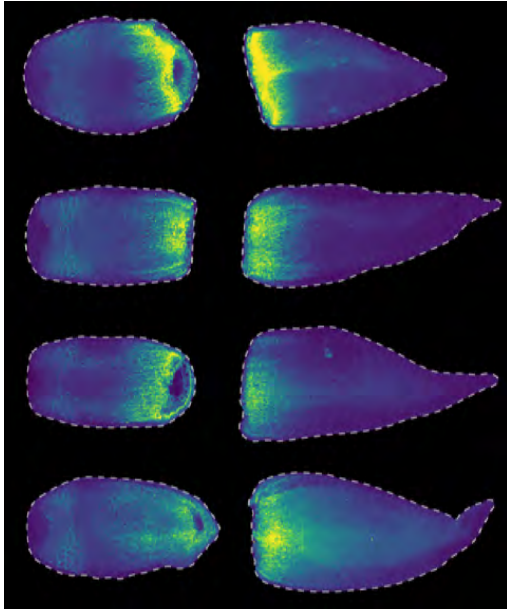
Experiments on the MuBot fish robot showing Penn State Graduate Student Kundan Panta positioning the robot, with Postdoctoral Fellow Divya Ramesh preparing to start recording. The MuBot is visible within the flow tank, which generates flow that the robot swims against. Photo by George Lauder

George Lauder is the Principal Investigator for *Collaborative Research: Artificially Evolved Modular Robotic Swimmers for Enhanced Mobility and Survivability in Challenging Hydrodynamic Environments*, a three-year \$302,687 research grant from the U.S. National Science Foundation.

The diversification and ecological success of fish species rest on 530 million years of evolution that successfully explored various



control and decision-making that combine modular behaviors to navigate in challenging hydrodynamic conditions.



Mansi Srivastava is the Principal Investigator for *Mechanisms for the Establishment of Polarity During Whole-Body Regeneration*, a \$1,000,000 three-year research grant from the U.S. National Science Foundation.

Whether it is a vertebrate re-growing a limb or an invertebrate building an entire body from a small fragment, a regenerative animal can create precisely the tissues it needs to replace what was lost to injury, such that newly made structures can integrate with existing tissues to restore organismal function.

How does the animal know which tissues it needs to regenerate? This feat is strikingly evident during whole-body regeneration, during which an animal bisected along its head-tail axis regenerates a new head and tail at the correct wound sites. This research seeks to understand the mechanistic causes of this phenomenon, which is referred to as regeneration polarity.

Across animals, Wnt signaling manages axis patterning during regeneration: high Wnt activity tells a wound to form a tail. Yet the true root of regeneration polarity is an open question: How do only tail-forming wounds establish high Wnt activity upon injury? While some upstream mechanisms are known in planarians and cnidarians, the injury-induced

decision-making that controls regeneration polarity is not understood in any species. The research team will systematically study the regulation of a key group of genes that are expressed asymmetrically between head and tail wounds just hours post-amputation, indicating the establishment of regeneration polarity.

Mandë Holford is the Principal Investigator for *The 2030STEM Champions and Fellows Network*, a two-year \$150,000 research grant from Burroughs Wellcome Fund (BWF). This project is also supported by Heising-Simons and the Unleashing Potential (UP) Foundation.

2030STEM was created to reimagine a STEM enterprise that reflects and supports all. The BWF-supported Champions and Fellows Network expands 2030STEM's conviction that change is empowered by people.

The Champions and Fellows Network is modeled on theories of collective impact that demonstrate how an interdependent web of relationships from different sectors and institutions may achieve a common objective. Specifically, this project will build an innovative and supportive model pathway for early to mid-career STEM researchers and professionals across STEM sectors (academia, industry, government, business and finance). At the same time, it will spotlight and reward those senior researchers and professionals who are invested as changemakers within their institutions through their intentional championing of a new generation of diverse STEM professionals.

The project will be conducted in two phases. In Year 1, the first class of Champions and Fellows will be established. In Year 2, pathways to access capital will be provided and the impact of the Champions-Fellows dyad will be evaluated to determine reproducibility and scalability of the model. The inaugural class of 2030STEM x BWF Fellows will be announced in the fall of 2025.



2030STEM advisor Dr. Angélica Cibrián-Jaramillo and her team in the field. Photos by Angélica Cibrián-Jaramillo

At left: Amputated tails and heads of acel worms showing fast activation of a regeneration protein at cut ends. Photo by Catriona Breen



RESEARCH MAKING HEADLINES

Getting Their Wiggle On



Amandine Gillet measuring vertebrae

Cetaceans—dolphins, porpoises and whales—are aquatic mammals descended from a land-dwelling ancestor that returned to the sea approximately 53 million years ago. To survive in the water, their body plan made remarkable adaptations, developing a streamlined shape, reducing the hindlimbs and evolving a tail fluke. A striking, but less visible, adaptation occurred inside the animal, in the backbone, making their undulating swimming style possible.

Stephanie E. Pierce, Postdoctoral Fellow **Amandine Gillet** and former lab member Katrina Jones propose a new method to study

the organization of the cetacean vertebral columns, dividing them into precaudal (torso) and caudal (tail) segments, which are then subdivided into modules and regions, allowing comparison among species with as few as 42 to

almost 100 vertebrae. Building on a statistical model developed by Jones and Prof. Pierce to study terrestrial mammals, the team used the new program, MorphoRegions, to analyze the massive data set prepared by Gillet during her PhD work, when she visited six museums around the world, gathering information on 139 specimens from 62 cetacean species and measuring 7,500 vertebrae.

The team discovered that the precaudal segment has fewer regions than in terrestrial mammals, but the caudal segment has more regions, possibly to provide propulsive force. They also found that species living near the shore in rivers and bays, versus the open water, have fewer vertebrae and regions but more differentiation between them, giving the former increased maneuverability and the latter more speed.

Gillet A, Jones KE, Pierce SE (2024) Repatterning of Mammalian Backbone Regionalization in Cetaceans. *Nat Commun* 15:7587 DOI: [10.1038/s41467-024-51963-w](https://doi.org/10.1038/s41467-024-51963-w)

Huge News About Tiny Bears

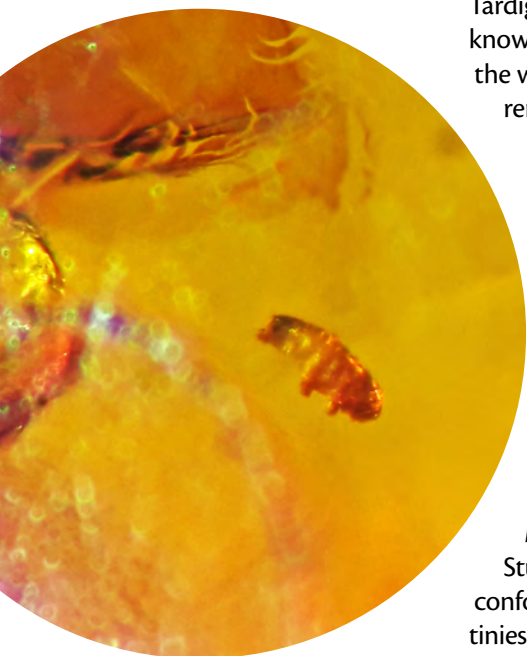
Tardigrades, charismatic creatures popularly known as “water bears,” are found throughout the world wherever there is water and are renowned for their ability to survive in the harshest conditions, even the vacuum of space, by going into a type of stasis called cryptobiosis.

Even though they have been around for millions of years, only three fossilized tardigrade ancestors have been found, all encased in amber, making research into their evolution difficult. The first fossil tardigrade was discovered in the 1960s in Cretaceous Canadian amber and was named *Beorn leggi*. Using the same specimen, Graduate Student **Marc A. Mapalo** employed confocal laser microscopy to examine the tiniest structures of *B. leggi* in detail, thus updating its morphological description for the first time in decades and repositioning it taxonomically. The amber also contains a

second tardigrade, previously deemed too poorly preserved to describe. Using the same imaging technology, Mapalo, **Javier Ortega-Hernández** and former lab member **Joanna M. Wolfe** were able to document its morphology and determine that it is a new species, which they christened *Aerobius dactylus*.

The formal redescrptions of these two fossils help in estimating the timing of key evolutionary events, suggesting that modern tardigrades likely diverged during the middle Cambrian (~499 million years ago) and may have developed their miniscule bodies around the same time. The research also points to the origin of cryptobiosis during the mid-to-late Paleozoic (180–420 million years ago), which could have helped tardigrades survive the end-Permian mass extinction.

Mapalo MA, Wolfe JM, Ortega-Hernández J (2024) Cretaceous Amber Inclusions Illuminate the Evolutionary Origin of Tardigrades. *Commun Biol* 7:953 DOI: [10.1038/s42003-024-06643-2](https://doi.org/10.1038/s42003-024-06643-2)



Tardigrade *Beorn leggi*



A Backyard Discovery

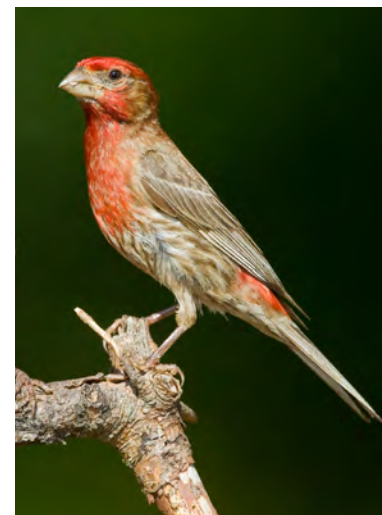
The House Finch, *Haemorrhous mexicanus*, may be a common backyard bird, but it is also a model organism for studying host-pathogen coevolution. A widespread disease outbreak of *Mycoplasma gallisepticum*, a conjunctivitis-causing bacterium, occurred in the eastern U.S. House Finch population from 1994 to 1998 and in the western U.S. population in 2002. To shed light on how the populations adapted to this pathogen, **Scott V. Edwards** and Postdoctoral Fellow **Bohao Fang** applied a pangenomic approach usually limited to humans, microbes, livestock and crops.

The researchers constructed a House Finch pangenome—a complete collection of all the variations found in a population—based on the DNA of 16 specimens in the MCZ Ornithology collection. The pangenome is based on high-resolution long-read DNA sequence data, which can better reveal structural variants—large DNA changes in the genome—that can affect fitness. Their approach contrasts with the traditional approach of mapping the sequences of

the population to the genome of a single reference individual. Their approach revealed a DNA inversion that occurred more than 10 million years ago. They found that the frequency of this inversion, estimated from the DNA of 135 birds sampled temporally and geographically, increased steadily over the 25 years since House Finches were first exposed to *M. gallisepticum*, indicating that this inherited structural variant may contribute to disease resistance.

The research illustrates the utility of combining population-scale long-read sequencing and pangenomic methods for studying wild animal populations and provides a real-life example of how a species deals with a new pathogen. It also offers clues about how other animals, even humans, might genetically respond to infectious diseases over time.

Fang B, Edwards SV (2024) Fitness Consequences of Structural Variation Inferred from a House Finch Pangenome. *Proc Natl Acad Sci USA* 121:e2409943121
DOI: [10.1073/pnas.2409943121](https://doi.org/10.1073/pnas.2409943121)



House Finch (*Haemorrhous mexicanus*)

Antenna Array

Myliobatid rays—eagle rays, cownose rays and manta rays—glide through the ocean, their long, slender tails trailing behind, but the structure and function of the tail has remained unknown. In a study by **George V. Lauder** and Postdoctoral Fellow **Júlia Chaumel**, the anatomy of the tail is examined to provide insights into its purpose.

The researchers studied eight specimens of cownose ray (*Rhinoptera bonasus*), six of them preserved in the MCZ Ichthyology collection and two from recently deceased animals. Micro-CT scans generated high-resolution 3D images of the tail structure and thin slices of stained tissues were examined under a microscope, revealing an elaborate internal anatomy. The micro-CT scans showed that the tail contains an extension of the vertebral column, where the nerves and blood are protected by mineralized cartilage that

becomes solid towards the tip. This lack of flexibility and musculature indicates that the tail is not used for propulsion. But the presence of a lateral line canal on both sides of the tail, along with numerous other sensory organs, suggests the tail is a complex sensory structure able to detect stimuli generated by movements of the surrounding water. Cownose rays are active swimmers living in diverse environments where background noises, like surface waves, are high. This sensitive tail structure seems to be able to detect relevant stimuli, such as prey and predators, with the ability to filter out unwanted stimuli. Therefore, the researchers propose that the tail acts as a hydrodynamic antenna.

Chaumel J, Lauder GV (2025) A Hydrodynamic Antenna: Novel Lateral Line System in the Tail of Myliobatid Stingrays. *Proc R Soc B* 292:20242192
DOI: [10.1098/rspb.2024.2192](https://doi.org/10.1098/rspb.2024.2192)



School of spotted eagle rays (*Aetobatus narinari*), a type of myliobatid ray



Heels Over Head



Charles Darwin's frog (*Minervarya charlesdarwini*) and its eggs

S. D. Biju (2)

Charles Darwin's frog, *Minervarya charlesdarwini*, has unusual mating behaviors. Native to the Andaman Islands of India, mating pairs cling to inner walls of water-filled tree cavities or root buttresses and do their business upside down, the only known frog to do so. But why?

An Indo-American team of biologists, including **James Hanken**, study leader and MCZ Associate **S. D. Biju** and co-leader and Biodiversity Postdoctoral Fellow **Sonali Garg** spent 55 days in the field over three years to document these behaviors, which have other interesting aspects.

Adult males compete aggressively for females, with complex calls to attract them. When other males try to break up a mating pair, they are met with punches, kicks and bites from the mating male. This need for defense seems to lead to the upside-down mating position, above the small puddle of water and away from “bachelor” males. Once mating is successful, the female deposits eggs on the

inner tree walls so that tadpoles will drop into the water upon hatching, safe from predators.

In addition to its natural habitat, the research team observed frogs breeding in unnatural sites in disturbed forests, such as rain-filled containers left as trash at the forest edge. The study highlights the need for conservation of the already threatened species and protection of its microhabitats to ensure adequate natural breeding sites.

While a Radcliffe Fellow during academic year 2023–2024, Biju directed production of a **short video documenting the unusual reproductive biology of Charles Darwin's frog**. In addition to rare footage of mating behavior, the video features an original score by composer and Radcliffe Fellow William Dougherty.

Biju SD, Garg S, Gokulakrishnan G, Sivaperuman C, Upadhyaya RK, Bee MA, Hanken J (2024) Tree Holes to Trash: Unique Upside-Down Terrestrial Spawning, Agonistic Interactions, Complex Mating Calls and Unnatural Breeding Alterations in *Minervarya charlesdarwini* (Anura, Dicroglossidae). *Breviora* 577:1–33
DOI: [10.3099/0006-9698-577.1.1](https://doi.org/10.3099/0006-9698-577.1.1)

Staff Highlight

“My mom tells me that as soon as I could walk, I would be out in the yard picking up rocks,” says **Jessica Cundiff**, curatorial associate in Invertebrate Paleontology. “For some reason I just loved rocks. In fourth grade we learned about earth science and that geologists are the scientists that study rocks, so I went home and told my parents that I wanted to be a geologist.” By high school, she knew she would pursue a geology degree and then specialize in paleontology.

After receiving her master's in geology at the University of Kansas, Jessica was hired as a curatorial assistant in the MCZ Invertebrate Paleontology collection, later becoming the curatorial associate, a position she has held for 17 years. “The collection has a long history and continues to be relevant, as new and exciting discoveries are still being made from these very old collections. Advances in technology, like CT scanning, have resulted in new discoveries being made with specimens that have been in the collection for close to 150 years, underscoring the importance of maintaining our specimens to make them available for future research.”

The Invertebrate Paleontology collection is made up of around two million specimens and just over 10,000 type specimens. While not the largest in North America, it contains the most diverse and significant holdings of classical material from European localities. These early specimens were often obtained through purchases from large private collections from Europe, such as the Schary Collection from the Czech Republic, which was sold to the MCZ in 1881. With about 100,000 specimens, it is the largest collection of Czech fossils outside of Prague.

But when asked which specimen she would save in a disaster, if she could save only one, she doesn't hesitate. “It would be a fossil sand dollar type specimen collected by Charles Darwin in 1834 in Patagonia while on the *Beagle* voyage.”



Melissa Aja



HIGHLIGHTS FROM THE COLLECTIONS

Collecting in the Antarctic



Gonzalo Giribet (all)

In February and March 2025, **Gonzalo Giribet**, curator in Invertebrate Zoology and Malacology, sailed the Southern Ocean aboard the RRS *Sir David Attenborough*. The cruise was run by the British Antarctic Survey, and Giribet was invited to be a member of the Benthic team, researching and sampling in the deep sea and along the ocean floor.

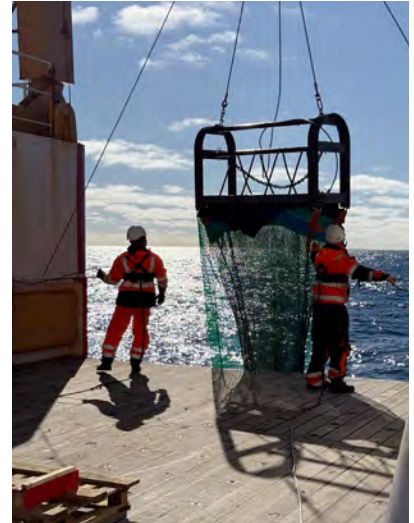


The RRS *Sir David Attenborough* is a multidisciplinary research platform operating in the polar regions and providing scientists with state-of-the-art facilities to research the oceans, seafloor,

ice and atmosphere. The 129-meter-long ice-breaking ship has built-in laboratories and remotely piloted science instruments to capture data from the deep ocean and previously inaccessible locations under the ice.

For seven weeks during the Antarctic summer, around 60 scientists operated in multiple interdisciplinary teams. The cruise departed from Punta Arenas, Chile, in early February, crossing towards the Atlantic via the Strait of Magellan and sailing past the Falkland Islands towards South Georgia, a British Overseas Territory.

“Sampling began in South Georgia,” Giribet explains, “and our team deployed the Agassiz Trawl, retrieving our first deep-sea samples from a depth of 550 meters. We also used an epibenthic sledge to collect much smaller bottom-dwelling organisms.” When not collecting specimens, the team was busy sorting samples and identifying and imaging specimens. On February 26, the Benthic team did the first scanning electron microscopy ever in the Southern Ocean, which led to the discovery of a new deep-sea gastropod.



After the South Georgia phase, the cruise headed south to the Scotia Arc, sailing among a superpod of perhaps 500 whales. “It was really one of these uplifting moments where you see what happens if you just leave nature alone. If you don't kill them, they come back. It was really, really fantastic in that sense.”

On March 21, the ship arrived at the southwest corner of A23a, the largest iceberg in the world. It calved from the ice shelf in 1986 but stayed stuck on the seabed until it began moving in 2020. Recently it was confirmed that A23a had again run aground.

“At one point we traversed A23a with the ship for four hours, it's so massive. We went to study a bit of its influence on the plankton and how it has affected the benthic community there, but despite swathing the seafloor for hours, we were unable to detect the scar of the iceberg on the sea floor.”



Although most of the samples went back to the British Antarctic Survey, Giribet obtained approximately 300 benthic and planktonic specimen lots for the Invertebrate Zoology and Malacology collections and added samples to the Cryogenic Collection. These small animals are important Antarctic specimens for the MCZ, supplementing groups that were previously poorly represented in the MCZ collections and providing soft-body specimens for species that were previously represented only by shells. Several research projects around these new samples are already nearing completion.



MCZ Expands Collection of Cichlids

In 2023, the MCZ arranged to accept the Axel Meyer Collection, Konstanz (AMCK), containing roughly 50,000 preserved fish samples. The collection consists primarily of Nicaraguan midas cichlids—the species complex that has been key to Meyer’s landmark research on speciation. The collection also includes large numbers of African cichlids and many more fishes, reflecting the Meyer lab’s interest in species diversification and evolution.

The MCZ is renowned for its outstanding collection of African Rift Lake cichlids. “The inclusion of these Central American Crater Lake cichlids significantly enhances the breadth of our holdings, addressing a previously underrepresented segment of the family,” says Curatorial Associate **Andrew Williston**.

MCZ staff traveled to Konstanz, Germany, to inventory, pack and prepare the collection for shipment to the MCZ. Three trips were made over the past year to ship almost 17,000 specimens, including genetic samples, whole fishes and heads of fishes. Additional

trips will occur through 2026 to prepare and ship the rest of the collection. This enormous accession will be cataloged and all available data will be integrated into

MCZbase, the Museum’s collections database, making the information available to researchers worldwide. The project relies on the hard work of **Anne Everly**, **Meaghan Sorce** and **Andrew Williston** in Ichthyology, **Cynthia Wang-Claypool** in Genetic Resources, and Harvard undergraduate **Florian Abruzzi**.



Amphilophus labiatus

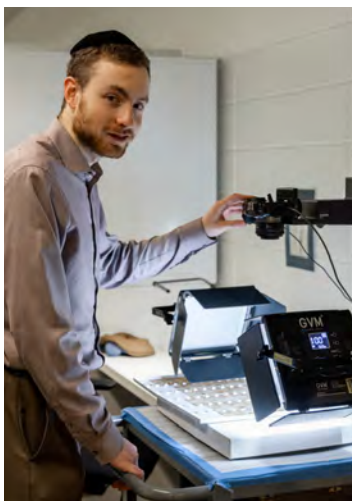
Meaghan Sorce



Meaghan Sorce sorting and preparing specimens for shipment

Cynthia Wang-Claypool

The Importance of the Microscopically Small



Even Dankowicz

Over the years, U.S. federal funding has supported a multitude of projects related to the MCZ collections, specifically those maintaining and restoring specimens and creating or improving digital specimen records. That federal support has facilitated decades of digitization efforts by collections personnel, resulting in more than two million digital specimen records in the Museum’s collections database, MCZbase.

Rehousing and Digitization of the Museum of Comparative Zoology Recent Invertebrate Microscope Slide Collections (InSLiDE), led by **Mansi Srivastava** and **Naomi E. Pierce**

and Curatorial Associates **Adam Baldinger**, **Crystal Maier** and **Jennifer Winifred Trimble**, is such a project. “Specimens mounted on glass slides enable examination of microscopic morphological structures of invertebrates and also serve as a long-term preservation method for whole invertebrate animals or their parts,” says Srivastava. There are approximately 50,000 slide-mounted specimens in the

collections that are being restored and their digital records created or enhanced. Additionally, high-quality photos are being taken of the approximately 3,000 slide-mounted type specimens—the physical specimen from which a species was originally described—that are of particular value to the scientific community. The resulting digital records will be accessible to researchers and the public through MCZbase, and restoring and rehousing the slides will ensure that they remain available for posterity.

This project, funded by a three-year \$639,620 grant from the U.S. National Science Foundation, supports the restoration and digitization efforts of slide-mounted specimens in the invertebrate collections of Entomology, Invertebrate Zoology and Malacology and the hiring of two curatorial assistants dedicated to the project, **Even Dankowicz** and **Amelia Lawson**.



Amelia Lawson

Juan Giribet (2)



PROJECTS & INITIATIVES

New Director of Exhibitions at the Harvard Museums of Science & Culture

The exhibition team for the Harvard Museums of Science & Culture collaborates closely with MCZ personnel to bring science to life at the public galleries in the Harvard Museum of Natural History. This year, after working as an exhibit designer at Harvard for nearly 25 years, Sylvie Laborde was promoted to director of exhibitions at the HMSC.

“Creating exhibitions with the MCZ is always an amazing experience,” says Laborde. “The faculty and students understand the importance of creating exhibitions for visitors, and they are great thought partners to guide us with the exhibit storyline and content development.” Her favorite part of any project with the MCZ is meeting with the collection managers and exploring the collection to find the perfect specimens to illustrate the topic being presented. This special collaboration results in exhibitions rich in current science and MCZ specimens.



Melissa Aja

Projects in development with the MCZ include an exhibition on velvet worms, a photo exhibit of visually striking slide-mounted specimens and a major exhibition planned for spring 2026 that will feature treasures from the MCZ, the Department of Earth and Planetary Sciences, and the Harvard University Herbaria.



Wendy Heywood

Gonzalo Giribet & Scott V. Edwards

Our Birds: Through a Lens of Hope

Our Birds: Through a Lens of Hope, a natural history photography exhibit in the Harvard Museum of Natural History entrance, displays stunning photographs by **Gonzalo Giribet** as he turns his lens on North American bird life to tell the story of the recovery of birds all around us. This series began in 2020 when the Covid-19 pandemic curtailed Giribet’s remote fieldwork plans. A passionate wildlife photographer driven by a need to be outdoors, he became familiar with many birds that were once threatened and extremely rare, from Piping Plovers to Bald Eagles, and how habitat restoration and conservation measures have brought them back.

“These wonderful photos capture some really amazing aspects of bird behavior and how they thrive in diverse habitats. The conclusion is clear: Gonzalo should consider a career change and become a full-time ornithologist!” jokes Scott V. Edwards, curator in Ornithology.



Gonzalo Giribet (2)

Atlantic Puffin (*Fratercula arctica*) in flight & Great Horned Owl owllet (*Bubo virginianus*)

Not Just Spring Cleaning

MCZ Collections staff work alongside Harvard Museums of Science & Culture staff to clean and protect specimens on display in the public galleries. “The purpose is partly visual—dusty exhibits don’t look that nice!—and partly for pest management,” says **Jeremy Kisala**, assistant registrar. “Dust and accumulated dead insects provide food sources for live pests and make it more difficult to notice ongoing issues with live insects during my monthly inspections of the cases.”

To clean a gallery, they first employ a HEPA vacuum to remove any dust and debris then wipe down all the surfaces. The team also takes the opportunity to fix any minor issues they discover, like burned-out light bulbs or other small repairs. Their efforts protect the integrity of the specimens while keeping the exhibitions ready for visitors to enjoy.



Stevie Kennedy-Gold holding a specimen of a screaming hairy armadillo (*Chaetophractus vellerosus*)



GRANT RECIPIENTS

Grants-in-Aid of Undergraduate Research

GUR grants support research by Harvard College undergraduates under faculty supervision. Priority is given to projects that utilize MCZ research collections, laboratories and facilities. Support for these grants comes from the MCZ's Myvanwy M. and George M. Dick Scholarship for Students.

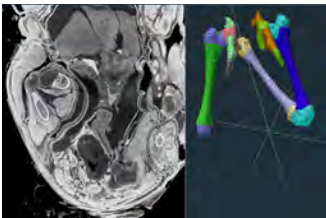


Inbar Maayan

Nia Lewis



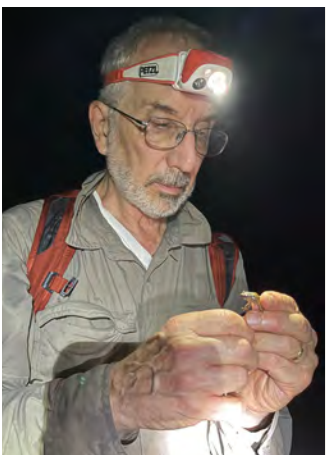
Ellie Fithian



Joi Gonzales

Aotus sp.

Recipient	Academic Dept./ Faculty Sponsor	Project Title	Amount
Lauren Bartel	OEB/Scott Edwards	Measuring <i>De Novo</i> Mutations in Florida Scrub Jays Using Pangenomic Methods	\$6,000
Connor Coffman	OEB/Gonzalo Giribet	<i>Paranuncia</i> Phylogeny and Species Delimitation	\$1,200
Miah Ebels-Duggan	SEAS/Elsie Sunderland	Soil, Produce, and Toxicant Analysis of Boston's Urban Farm Network	\$5,055
Ellie Fithian	OEB/Andrew Davies	Assessing the Impact of Wild Prey Abundance on Livestock Depredation by Lions in Laikipia, Kenya	\$4,981
Joi Gonzales	HEB/Terence Capellini	Novel Characterization of Human and Primate Embryonic Hindlimb Development	\$1,200
Nicholas Harpe	OEB/Andrew Davies	Investigating White Rhino Middens as Biodiversity Hotspots in Kruger National Park	\$1,905
Nia Lewis	OEB/Robin Hopkins	Investigating Genetic Clines in Jamaican Anoles	\$3,500
Hannah Nguyen	OEB/Stephanie Pierce	Form and Function of the Axial Skeleton Across the Tetrapod Water/Land Transition	\$1,200
Ananya Salem	OEB/Mansi Srivastava	Molecular Organization of a Diffuse Brain	\$1,200
Ashwin Sivakumar	OEB/Scott Edwards	Genetic Architecture of Wing Morphology Across the Oscine Radiation	\$5,000
Aditya Tummala	Economics/David Laibson	Exploring Local Community Involvement in Kafue National Park, Zambia	\$5,500
Total Awards			\$36,741



James Hanken



Javier Ortega-Hernández, Rudy Lerosey-Aubril & Walker Weyland



Paulino Siqueira Ribeiro



Field Research Grants

Field research by those at the MCZ is sponsored by generous gifts from donors and enables field research and specimen collection that may otherwise not be possible.

A gift from family and friends of Professor Jenkins established the **Farish A. Jenkins Jr. Fund** to support student fieldwork in comparative zoology. Andrew V. McQuilling, AB 1988 and MBA 1994, and Mirtha M. Cabral, MBA 1994, created the **McQuilling-Cabral Fund** to support research by MCZ faculty-curators, postdoctoral fellows and graduate students in the Dominican Republic. The **Ken Miyata Fund in Herpetology** and the **Ken Miyata Fund for Field Research** were established by gifts from Barbara Jil Wu, PhD 1981, and Eric Larson, AB 1977, and other close friends of Dr. Miyata to support research by graduate students and others in herpetology. **Putnam Expedition Grants** support MCZ faculty-curators, postdoctoral fellows and graduate students collecting specimens and data relating to the study of comparative zoology and are made possible by a gift from Mr. George Putnam Jr., AB 1949 and MBA 1951, and Mrs. Nancy Putnam.

Recipient	Grant Source	MCZ Department/ Faculty Sponsor	Project Title	Amount
Kaylin Chong & Paulino Siqueira Ribeiro	McQuilling-Cabral	Entomology/Farrell	Exploring the Biodiversity of <i>Wyeomyia</i> Mosquitoes and Argasidae Ticks in the Dominican Republic	\$10,000
Juli Cosgrove	Putnam	Invertebrate Zoology/Giribet	Puerto Rican Island Shelf Biogeography: A Tale of Two Poor Dispersers	\$12,421
Scott V. Edwards	Putnam	Ornithology	Collection of High-Quality Tissues for Seasonal Gene Expression and Metabolic Profiling of Passerine Birds of the Southwestern U.S.	\$4,821
Gonzalo Giribet	Putnam	Invertebrate Zoology	A Survey of the Benthic Deep-Sea Fauna of the Southern Ocean	\$5,162
James Hanken	Miyata	Herpetology	Cryptic Diversity of Miniaturized Vertebrates: Mexican Salamanders of the Genus <i>Thorius</i>	\$5,648
Jordan Johnson	Jenkins Jr.	Entomology/Farrell	Investigating the Convergent Host Shifts of a Holarctic Group of Tree-Feeding Beetles	\$11,800
Kelsie Lopez	Jenkins Jr.	Ornithology/Edwards	Evaluating the Extent of Regulatory Convergence in Arid-Adapted Typical Antbirds (Thamnophilidae) with Comparative Transcriptomics	\$4,250
Inbar Maayan	Putnam	Ornithology/Edwards	Chromosome Evolution and Diversification in the Jamaican <i>Anolis</i> Adaptive Radiation	\$19,667
Javier Ortega-Hernández	Putnam	Invertebrate Paleontology	Rediscovering the Long-Lost Red Wheeler Fossil Lagerstätte and Its Extraordinary Middle Cambrian Burgess Shale-Type Biota	\$5,315
Stephanie E. Pierce	Putnam	Vertebrate Paleontology	The Australian Record of Earth's Greatest Mass Extinction	\$5,850
Stephanie E. Pierce	Putnam	Vertebrate Paleontology	The Rise of Crown Tetrapods During the Carboniferous Period	\$5,900
Lily Shapiro	Jenkins Jr.	Invertebrate Zoology/Giribet	Characterizing the <i>Eoperipatus</i> Velvet Worms of Singapore	\$9,900
			Total Awards	\$100,734



Lily Shapiro

Juli Cosgrove



Lauren Bartel



Damary Calder

Inbar Maayan



Juli Cosgrove

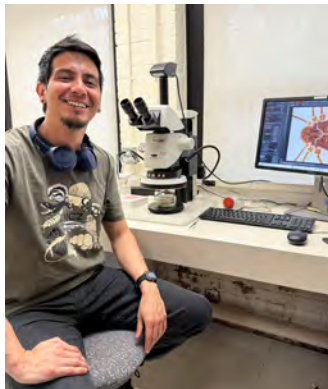
Anadenobolus monilicornis



Christian Thrane



Daercio Lucena



Miguel Medrano

Gonzalo Giribet



Harshil Patel

Ernst Mayr Travel Grants in Animal Systematics

Ernst Mayr Grants support travel for research in animal systematics and are open to the scientific community worldwide. The principal objective of these grants is to stimulate taxonomic work on neglected taxa and/or poorly described species. Ernst Mayr Grants typically facilitate visits to institutional collections, with preference given to research that uses MCZ's collections. These grants are made possible by a gift from Professor and former MCZ Director Ernst Mayr.

Recipient	Institutional Affiliation	Project Title	Amount
Olivier Béthoux	National Museum of Natural History, Paris	Reflectance Transforming Imaging to Illuminate Palaeozoic Insects	\$2,100
Valentine Bouju	Harvard University	What Does Miocene Dominican Amber Unveil About the Past Diversity of Formicidae? Revision and Investigation of the MCZ Collection	\$1,740
Arnau Calatayud	University of Idaho	Understanding the Generation and Maintenance of <i>Euagrus</i> Biodiversity	\$2,000
Erik Ciaccio	University of Idaho	<i>Antrodiaetus</i> Evolution	\$2,000
Omar Entiauspe-Neto	University of São Paulo	A Reappraisal of the Herpetological Collection of Afrânio Pompílio B. Gastos do Amaral (1894–1982) at the Museum of Comparative Zoology, Harvard	\$2,500
Rafael Ferreira	University of Idaho	Reconnecting the Trapdoors: Taxonomy, Phylogenomics and Biogeography of Trapdoor Spiders of the Family Idiopidae Simon, 1889	\$2,500
Misha Hernández-Lozano	National Autonomous University of Mexico	Revision of <i>Mycale cecilia</i> (Porifera: Demospongiae) from Mexico Deposited in the Museum of Comparative Zoology, Harvard	\$2,400
Jane Herrera-Uria	Cuban Society of Zoology	Taxonomic Revision and Conservation Status of Endemic Genus <i>Pineria</i> Poey, 1854, from Isla de la Juventud, Cuba	\$1,500
Matias Izquierdo	National University of Córdoba	The Systematics of the American Metaltellinae (Araneae, Desidae)	\$2,500
Breanna Jordan	Harvard University	Taking a Deeper Look: Relationships of Pycnogonida Using Genetics and Morphology	\$2,485
Laura Laino	Federal University of Paraná	Taxonomic Review of the Ant Genus <i>Acanthognathus</i> (Formicidae: Myrmicinae)	\$2,500



Likely undescribed genus of the family Podoctidae, MCZ.IZ:18809, by Miguel Medrano



Adelphe brasiliensis

Daercio Lucena





Dorymyrmex sp.,
by Jill Oberski

Recipient	Institutional Affiliation	Project Title	Amount
Yu-Hsiu Lin	Texas A&M University	Phylogeny, Taxonomy, and Biogeography of the Pit-Building Antlion Tribe Myrmeleontini (Neuroptera: Myrmeleontidae)	\$2,110
Daercio Lucena	National Museum of Natural History, Smithsonian Institution	Unveiling the Hidden Diversity of Cuckoo Wasps from the Neotropical Region (Hymenoptera: Chrysididae)	\$2,500
Miguel Medrano	Federal University of Rio de Janeiro	Bridging the Knowledge Gap: Taxonomic and Morphological Investigations of Understudied Caribbean Cosmetids (Opiliones)	\$2,400
Nelson Novo	National Scientific and Technical Research Council, Argentina	Morphological Variability and Adaptations of the Postcranium in Living and Extinct New World Monkeys (Platyrrhini: Primates): Phylogenetic Implications	\$2,400
Jill Oberski	Senckenberg Natural History Museum and Research Institute	A Taxonomic Revision of Nearctic <i>Dorymyrmex</i> Ants (Formicidae: Dolichoderinae)	\$2,500
Harshil Patel	Thackeray Wildlife Foundation, India	Taxonomy and Systematics of Some Poorly Known Squamates of the Indian Subcontinent	\$2,200
Maria Paula Pereira	Bernardino Rivadavia Natural Sciences Argentine Museum	Revisiting Type Specimens and MCZ Collection: A Comprehensive Taxonomic Review of the Kimulidae (Opiliones: Laniatores: Zalmoxoidea)	\$2,500
Karol Szawaryn	Polish Academy of Sciences	Revision of the New Zealand Ladybird Beetles from the Tribe Coccidulini (Coleoptera: Coccinellidae)	\$2,500
Christian Thrane	University of Copenhagen	Investigating the Exceptional Morphological Diversity of the Viviparous Toads of Tanzania Using Integrative Taxonomic Methods (Anura: Bufonidae: Nectophrynoidea)	\$2,051
		Total Awards	\$45,386



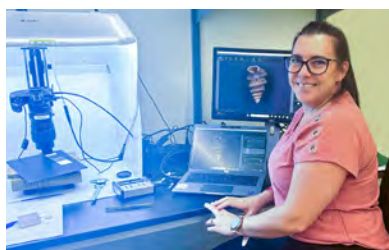
Omar Entiauspe-Neto



Maria Paula Pereira



Misha Hernández-Lozano



Jane Herrera-Uria



Nelson Novo



Saguinus geoffroyi,
by Nelson Novo



AWARDS & RECOGNITION

Juan Giribet



Breda Zimkus



Paulino Siqueria Ribeiro

Paula C. Rodríguez-Flores



Munidopsis giribeti



Teresa Pegan

Faculty-Curators

Scott V. Edwards received the 2024 Presidents' Award for Lifetime Achievement by the Society of Systematic Biologists and was featured in the first Veritalk episode from Harvard Faculty of Arts and Sciences, a short-form video discussing bird biology and evolution.

Brian D. Farrell and Postdoctoral Fellow **Paulino Siqueria Ribeiro** were awarded a Lemann Grant for their proposal "Phylogenetics and Genomics of *Wyeomyia* Mosquito Adaptations to Different Breeding Sites in Brazil and Elsewhere."

A new species of deep-sea squat lobster was named after **Gonzalo Giribet**. *Munidopsis giribeti* honors his inspirational passion and dedication to invertebrates.

Mandë Holford (incoming July 2025) was elected a Fellow of the American Association for the Advancement of Science.

George V. Lauder was a co-awardee of a 2024 Star-Friedman Challenge for Promising Scientific Research award for the project "How to Regenerate a Limb? Integrating Analyses of Metabolism and Developmental Biology."

Javier Ortega-Hernández and Research Scientist **Rudy Lerosey-Aubril** were awarded a Dean's Competitive Fund for Promising Scholarship award for their project "A Fresh North American View into the Cambrian Explosion—New Insights into the Paleobiology and Exceptional Preservation of the 500-Million-Year-Old Marjum Biota from Western Utah."

Naomi E. Pierce received the 2025 Lifetime Achievement Award from the Society for the Study of Evolution.

Postdoctoral Researchers

Paul Bump, in the Srivastava lab, received a Postdoctoral Individual National Research Service Award from the National Institute of General Medical Sciences.

Teresa Pegan, in the Edwards lab, received a James G. Cooper Early Professional Award by the American Ornithological Association.

Trey Scott, in the N. Pierce lab, received a fellowship from the Jane Coffin Childs Memorial Fund for Medical Research.

Yangfan Zhang, in the Lauder lab, was featured in the *Journal of Experimental Biology* Spotlight on Researchers.

Graduate Students

RJ Knecht, in the N. Pierce Lab, became a Research Affiliate of the Turkana Basin Institute in Kenya.

Tina Kuang, in the S. Pierce lab, was awarded a Robert A. Chapman Memorial Scholarship for Vertebrate Locomotion from the Harvard Faculty of Arts and Sciences.

Catherine Strong, in the S. Pierce lab, was awarded an American Association for Anatomy Predoctoral Fellowship and a Robert A. Chapman Memorial Scholarship for Vertebrate Locomotion from the Harvard Faculty of Arts and Sciences.

Wendy Valencia-Montoya, in the N. Pierce lab, received a Harvard Junior Fellowship.

Staff

Ognenka (Ogie) Avramovska, education and outreach manager for the Department of Organismic and Evolutionary Biology, received a Dean's Distinction award.

Caroline Fernald, executive director for the Harvard Museums of Science & Culture, received an Inspire Award from the Cambridge Chamber of Commerce.

Breda Zimkus, director of Collections Operations, celebrated her 15-year anniversary of working at the MCZ.



FINANCIAL DATA

These charts describe the income and expenses of the Museum of Comparative Zoology in fiscal year 2024.

Endowment income funds much of the Museum’s activities, such as acquisition and maintenance of collections, faculty and staff salaries, capital projects, and facilities renovation and maintenance. It includes the annual distribution (payout) and endowed funds decapitalized per donor request.

Gifts are donations received in support of Museum activities that are available for current use; does not include donations for endowed funds.

Other Income comprises miscellaneous income from publication subscriptions, royalties, sales and fees, and cost recovery from other MCZ-sponsored activities.

Overhead is funds paid from sponsored projects to cover associated facilities and administrative costs. It is shown as both income (**Overhead Earned**) and expenses (**Overhead Charged**).

Accumulation of Restricted and Unrestricted Reserves indicates net growth of balances in restricted and

unrestricted gifts and endowments from, for example, interest payments and unspent portions of the current year’s endowment payouts.

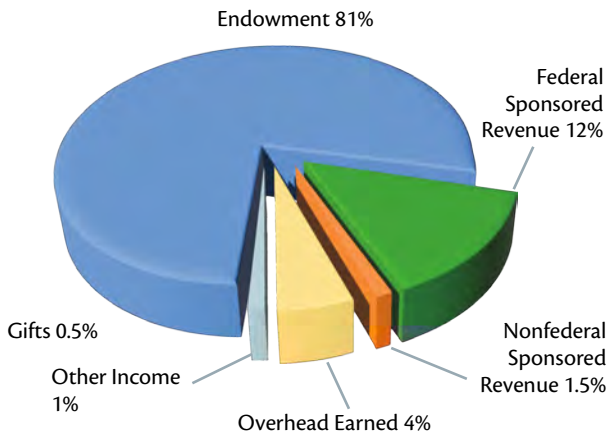
Building expenses such as maintenance, facility improvements and utilities are captured in the **Space & Occupancy** category.

Operating Expenses consist of equipment purchases, supplies, and consultant and conference fees, as well as annual subventions for administrative services and MCZ support for faculty-curator research.

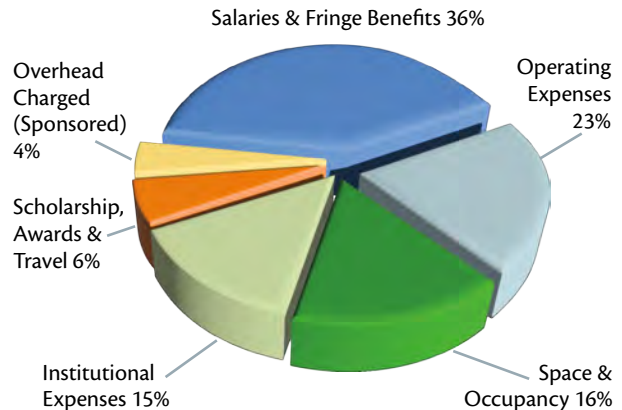
Support for MCZ-affiliated graduate students in OEB is included in **Scholarships, Awards & Travel**.

Institutional Expenses are support for other University activities outside the MCZ, including FAS and University initiatives and general operating support to the Harvard Museums of Science & Culture.

INCOME



EXPENSES & NON-OPERATING FUNDS



Income

Endowment	\$20,303,525
Federal Sponsored Revenue	\$2,974,294
Overhead Earned	\$970,339
Nonfederal Sponsored Revenue	\$350,205
Other Income	\$342,864
Gifts	\$118,857
Accumulation of Restricted Reserves	(\$117, 205)
Accumulation of Unrestricted Reserves	(\$1,455,818)
Total	\$23,487,061

Expenses

Salaries & Fringe Benefits	\$8,551,554
Operating Expenses	\$5,276,238
Space & Occupancy	\$3,630,989
Institutional Expenses	\$3,534,474
Scholarships, Awards & Travel	\$1,523,468
Overhead Charged (Sponsored)	\$970,338
Total	\$23,487,061



PUBLICATIONS IN 2024

- Ahuja N and 10 others including **Lord A** (2024) Giants Among Cnidaria: Large Nuclear Genomes and Rearranged Mitochondrial Genomes in Siphonophores. *Genome Biol Evol* 16:evae048 DOI: [10.1093/gbe/evae048](https://doi.org/10.1093/gbe/evae048)
- **Alegre A**, Pérez-González A (2024) Two New Species of *Caribbiantes*, with the Redescription of the Type Species and a Review of Male Genital Patterns in Antillean Stenostyginae (Opiliones: Laniatores: Biantidae). *Zootaxa* 5514:401–430 DOI: [10.11646/zootaxa.5514.5.1](https://doi.org/10.11646/zootaxa.5514.5.1)
- Ament DC, **Pereira TPL** (2024) Diversity, Distribution and General Knowledge of the Brazilian Phoridae (Diptera), the Family of Flies with Most Species Known in the Country. *Zoologia (Curitiba)* 41:e24010 DOI: [10.1590/S1984-4689.v41.e24010](https://doi.org/10.1590/S1984-4689.v41.e24010)
- Bentley AB and 15 others including **Zimkus BM** (2024) Community Action: Planning for Specimen Management in Funding Proposals. *BioScience* 74:435–439 DOI: [10.1093/biosci/biae032](https://doi.org/10.1093/biosci/biae032)
- **Biewener AA**, Wilson AM (2024) Integrating Biomechanics, Energetics and Ecology Perspectives in Locomotion. (Commentary) *J Exp Biol* 228:jeb249585 DOI: [10.1242/jeb.249585](https://doi.org/10.1242/jeb.249585)
- **Biju SD**, **Garg S**, Gokulakrishnan G, Sivaperuman C, Upadhyaya RK, Bee MA, **Hanken J** (2024) Tree Holes to Trash: Unique Upside-Down Terrestrial Spawning, Agonistic Interactions, Complex Mating Calls and Unnatural Breeding Alterations in *Minervarya charlesdarwini* (Anura, Dicroglossidae). *Breviora* 577:1–33 DOI: [10.3099/0006-9698-577.1.1](https://doi.org/10.3099/0006-9698-577.1.1)
- **Bishop PJ**, **Pierce SE** (2024) The Fossil Record of Appendicular Muscle Evolution in Synapsida on the Line to Mammals: Part I—Forelimb. *Anat Rec* 307:1764–1825 DOI: [10.1002/ar.25312](https://doi.org/10.1002/ar.25312)
- **Bishop PJ**, **Pierce SE** (2024) The Fossil Record of Appendicular Muscle Evolution in Synapsida on the Line to Mammals: Part II—Hindlimb. *Anat Rec* 307:1826–1896 DOI: [10.1002/ar.25310](https://doi.org/10.1002/ar.25310)
- **Bishop PJ**, **Pierce SE** (2024) Late Acquisition of Erect Hindlimb Posture and Function in the Forerunners of Therian Mammals. *Sci Adv* 10:eadr2722 DOI: [10.1126/sciadv.adr2722](https://doi.org/10.1126/sciadv.adr2722)
- **Bishop PJ**, **Pierce SE** (2024) Reconstructions of Hindlimb Musculature in Extinct Pre-Therian Synapsids. *Bull Mus Comp Zool* 163:417–471 DOI: [10.3099/MCZ82](https://doi.org/10.3099/MCZ82)
- Blackburn DC and 38 others including **Gage MW**, **Hanken J** (2024) Increasing the Impact of Vertebrate Scientific Collections Through 3D Imaging: The openVertebrate (oVert) Thematic Collections Network. *BioScience* 74:169–186 DOI: [10.1093/biosci/biad120](https://doi.org/10.1093/biosci/biad120)
- Boeger W and 937 others including **Pereira TPL** (2024) Catálogo Taxonômico da Fauna do Brasil: Setting the Baseline Knowledge on the Animal Diversity in Brazil. *Zoologia (Curitiba)* 41:e24005 DOI: [10.1590/S1984-4689.v41.e24005](https://doi.org/10.1590/S1984-4689.v41.e24005)
- Butler JM, McKinney JE, Ludington SC, Mabogunje M, Baker P, **Singh D**, **Edwards SV**, O'Connell LA (2024) Tadpoles Rely on Mechanosensory Stimuli for Communication When Visual Capabilities Are Poor. *Dev Biol* 514:66–77 DOI: [10.1016/j.ydbio.2024.05.006](https://doi.org/10.1016/j.ydbio.2024.05.006)
- Bredeson JV and 37 others including **Laslo M**, **Hanken J** (2024) Conserved Chromatin and Repetitive Patterns Reveal Slow Genome Evolution in Frogs. *Nat Commun* 15:579 DOI: [10.1038/s41467-023-43012-9](https://doi.org/10.1038/s41467-023-43012-9)
- Carvalho APS and 28 others including **Pierce NE** (2024) Comprehensive Phylogeny of Pieridae Butterflies Reveals Strong Correlation Between Diversification and Temperature. *iScience* 27:109921 DOI: [10.1016/j.isci.2024.109336](https://doi.org/10.1016/j.isci.2024.109336)
- **Chong K**, Grah A, Perl C, Sumner-Rooney L (2024) Allometry and Ecology Shape Eye Size Evolution in Spiders. *Curr Biol* 34:3178–3188.e5 DOI: [10.1016/j.cub.2024.06.020](https://doi.org/10.1016/j.cub.2024.06.020)
- **Del Mouro L**, **Lerosey-Aubril R**, Botting J, Coleman R, Gaines RR, Skabelund J, Weaver JC, **Ortega-Hernández J** (2024) A New Sponge From the Marjum Formation of Utah Documents the Cambrian Origin of the Hexactinellid Body Plan. *R Soc Open Sci* 11:231845 DOI: [10.1098/rsos.231845](https://doi.org/10.1098/rsos.231845)
- **Derkarabetian S**, **Benavides LR**, **Giribet G** (2024) Reassessing the Phylogeny of Cyphophthalmi with Phylogenomics: A UCE-Based Phylogeny of Mite Harvesters (Opiliones). *Mol Phylogenet Evol* 199:108143 DOI: [10.1016/j.ympev.2024.108143](https://doi.org/10.1016/j.ympev.2024.108143)
- Dinnage R, Sarre SD, Duncan RP, Dickman CR, **Edwards SV**, Greenville AC, Wardle GM, Gruber B (2024) slimr: An R Package for Tailor-Made Integrations of Data in Population Genomic Simulations Over Space and Time. *Mol Ecol Resour* 24:e13916 DOI: [10.1111/1755-0998.13916](https://doi.org/10.1111/1755-0998.13916)
- **Edwards SV**, **Cloutier A**, Cockburn G, Driver R, **Grayson P**, Katih K, Baldwin M, Sackton T, Baker A (2024) A Nuclear Genome Assembly of an Extinct Flightless Bird, the Little Bush Moa. *Sci Adv* 10:eadj6823 DOI: [10.1126/sciadv.adj6823](https://doi.org/10.1126/sciadv.adj6823)
- **Edwards SV**, **Hanken J**, Shubin NH, Liu J (2024) David B. Wake. *Proc Amer Philos Soc* 165:165–173 DOI: [10.1353/pro.2024.a960776](https://doi.org/10.1353/pro.2024.a960776)
- **Fang B**, **Edwards SV** (2024) Fitness Consequences of Structural Variation Inferred From a House Finch Pangenome. *Proc Natl Acad Sci USA* 121:e2409943121 DOI: [10.1073/pnas.2409943121](https://doi.org/10.1073/pnas.2409943121)
- Fath MA, Wong G, Colombero C-R, **Gabler-Smith MK**, **Lauder GV**, Wainwright DK (2024) Patterns of Dermal Denticle Loss in Sharks. *J Morphol* 285:e21764 DOI: [10.1002/jmor.21764](https://doi.org/10.1002/jmor.21764)
- **Ferrão M**, **Hanken J**, Oda FH, Campião KM, Penhacek M, Anjos S, Rodrigues DJ (2024) A New Snouted Treefrog (Anura, Hylidae, *Scinax*) from Fluvial Islands of the Juruena River, Southern Brazilian Amazonia. *PLoS One* 19:e029244 DOI: [10.1371/journal.pone.0292441](https://doi.org/10.1371/journal.pone.0292441)
- **Ferreira AS**, **Ferrão M**, Cunha-Machado AS, Magnusson WE, **Hanken J**, Lima AP (2024) Phylogenetic Position of the Amazonian Nurse Frog *Allobates gasconi* (Morales 2002) Revealed by Topotypical Data. *Org Divers Evol* 24:99–118 DOI: [10.1007/s13127-023-00630-x](https://doi.org/10.1007/s13127-023-00630-x)
- Friedman M, Tinoco Figueroa R, Hodnett J-PM, Lucas SG, **Higgins RR**, **Pierce S**, Giles S (2024) A New Genus and Species of Large Macrodon t Actinopterygian from the Pennsylvanian (Kasimovian/Missourian) Atrasado Formation of New Mexico. *Contr Mus Paleontol Univ Michigan* 36:8–42
- **Geburzi JC**, **Rodríguez-Flores PC**, **Derkarabetian S**, **Giribet G** (2024) From the Shallows to the Depths: A New Probe Set to Target Ultraconserved Elements for Decapoda and Other Malacostraca. *Front Mar Sci* 11:1429314 DOI: [10.3389/fmars.2024.1429314](https://doi.org/10.3389/fmars.2024.1429314)
- **Gemmell P**, Sackton T, **Edwards SV**, Liu J (2024) A Phylogenetic Method Linking Nucleotide Substitution Rates to Rates of Continuous Trait Evolution. *PLoS Comput Biol* 20:e1011995 DOI: [10.1371/journal.pcbi.1011995](https://doi.org/10.1371/journal.pcbi.1011995)
- **Gillet A**, Jones KE, **Pierce SE** (2024) Repatterning of Mammalian Backbone Regionalization in Cetaceans. *Nat Commun* 15:7587 DOI: [10.1038/s41467-024-51963-w](https://doi.org/10.1038/s41467-024-51963-w)
- **Giribet G** (2024) Q & A Gonzalo Giribet. *Curr Biol* 34:R1–R4
- Gittes RF, Rist M, Treves S, **Biewener AA** (2024) Author Correction: Autoregulation in Rats with Transplanted Supernumerary Kidneys. *Nature* 636:E11 DOI: [10.1038/s41586-024-08461-2](https://doi.org/10.1038/s41586-024-08461-2)
- **González-Delgado S**, **Rodríguez-Flores PC**, **Giribet G** (2024) Testing Ultraconserved Elements (UCEs) for Phylogenetic Inference Across Bivalves (Mollusca: Bivalvia). *Mol Phylogenet Evol* 198:108129 DOI: [10.1016/j.ympev.2024.108129](https://doi.org/10.1016/j.ympev.2024.108129)
- **Gozashti L**, **Hoekstra HH** (2024) Accounting for Diverse Transposable Element Landscapes Is Key to Developing and Evaluating Accurate *De Nova* Annotation Strategies. *Genome Biol* 25:4 DOI: [10.1186/s13059-023-03118-1](https://doi.org/10.1186/s13059-023-03118-1)
- Gutiérrez-Trejo N and 12 others including **Farrell BD** (2024) Phylogenomics of *Tetraopes* Longhorn Beetles Unravels Their Evolutionary History and Biogeographic Origins. *Sci Rep* 14:7285 DOI: [10.1038/s41598-024-57827-z](https://doi.org/10.1038/s41598-024-57827-z)
- **Hanken J** (2024) SATO, Ikio. Monograph of Japanese Tailed Amphibians. *Arch Nat Hist* 51:211–212 DOI: [10.3366/anh.2024.0923](https://doi.org/10.3366/anh.2024.0923)
- **Hulett RE**, **Rivera-López C**, **Gehrke AR**, **Gompers A**, **Srivastava M** (2024) A Wound-Induced Differentiation Trajectory for Neurons. *Proc Natl Acad Sci USA* 121:e2322864121 DOI: [10.1073/pnas.2322864121](https://doi.org/10.1073/pnas.2322864121)
- Jiang Z and 13 others including **Edwards SV** (2024) Gene Flow and an Anomaly Zone



Complicate Phylogenomic Inference in a Rapidly Radiated Avian Family (Prunellidae). *BMC Biol* 22:49 DOI: [10.1186/s12915-024-01848-7](https://doi.org/10.1186/s12915-024-01848-7)

- Jones KE, Angielczyk KD, Pierce SE (2024) Origins of Mammalian Vertebral Function Revealed Through Digital Bending Experiments. *Proc R Soc B* 291:20240820 DOI: [10.1098/rspb.2024.0820](https://doi.org/10.1098/rspb.2024.0820)
- Karma N, Ortega-Hernández J (2024) Post-Cambrian Survival of the Tubicolous Scalidophoran *Selkirkia*. *Biol Lett* 20:20240042 DOI: [10.1098/rsbl.2024.0042](https://doi.org/10.1098/rsbl.2024.0042)
- Kautt A, Chen J, Lewarch CL, Hu C, Turner KM, Lassance JM, Baier F, Bedford NL, Bendesky A, Hoekstra HE (2024) Evolution of Gene Expression Across Brain Regions in Behaviourally Divergent Deer Mice. *Mol Ecol* 00:e17270 DOI: [10.1111/mec.17270](https://doi.org/10.1111/mec.17270)
- Kawahara AY, Miller DR, Solis MA, Farrell BD (2024) Charles Mitter (1948–2024) Evolutionary Biologist, Consortium Builder, and Leader in Insect Evolutionary Biology. *Am Entomol* 70:58 DOI: [10.1093/ae/tmae051](https://doi.org/10.1093/ae/tmae051)
- Kim S, Farrell BD (2024) Target Enrichment Museomics of the Asian Long-Horned Beetle and Its Relatives (Cerambycidae: *Anoplophora*) Reveals Two Independent Origins of Life in the Cold. *Syst Entomol* 50:139–153 DOI: [10.1111/syen.12647](https://doi.org/10.1111/syen.12647)
- Kingsley EP, Hager ER, Lassance JM, Turner KM, Harringmeyer OS, Kirby C, Neugeboren BI, Hoekstra HE (2024) Adaptive Tail-Length Evolution in Deer Mice Is Associated with Differential *Hoxd13* Expression in Early Development. *Nat Ecol Evol* 8:791–805 DOI: [10.1038/s41559-024-02346-3](https://doi.org/10.1038/s41559-024-02346-3)
- Knecht RJ, Benner JS, Dunlop JA, Renczkowski MD (2024) The Largest Palaeozoic Whip Scorpion and the Smallest (Arachnida: Uropygi: Thelyphonida); A New Species and a New Ichnospecies from the Carboniferous of New England, USA. *Zool J Linn Soc* 200:690–704 DOI: [10.1093/zoolinlean/zlad088](https://doi.org/10.1093/zoolinlean/zlad088)
- Knecht RJ, Benner JS, Swain A, Azevedo-Schmidt L, Cleal CJ, Labandeira CC, Engel MS, Dunlop JA, Seldon PA, Eble CF, Renczkowski MD, Wheeler DA, Funderburk MM, Emma SL, Knoll AH, Pierce NE (2024) Early Pennsylvanian Lagerstätte Reveals a Diverse Ecosystem on a Subhumid, Alluvial Fan. *Nat Commun* 15:7876 DOI: [10.1038/s41467-024-52181-0](https://doi.org/10.1038/s41467-024-52181-0)
- Kryukov AP, Kryukov KA, Collier K, Fang B, Edwards SV (2024) Mitogenomics Clarifies the Position of the Nearctic Magpies (*Pica Hudsonia* and *Pica Nuttalli*) Within the Holarctic Magpie Radiation. *Curr Zool* 70:618–630 DOI: [10.1093/cz/zoad048](https://doi.org/10.1093/cz/zoad048)
- Lerosey-Aubril R, Malet J, Coleman R, Del Mouro L, Gaines R, Skabelund J, Ortega-Hernández J (2024) Benthic Pterobranchs from the Cambrian (Drumian) Marjum Konservat-

Lagerstätte of Utah. *Pap Palaeontol* 10:e1555 DOI: [10.1002/spp2.1555](https://doi.org/10.1002/spp2.1555)

- Lerosey-Aubril R, Ortega-Hernández J (2024) A Long-Headed Cambrian Soft-Bodied Vertebrate from the American Great Basin Region. *R Soc Open Sci* 11:240350 DOI: [10.1098/rsos.240350](https://doi.org/10.1098/rsos.240350)
- Li X, Marvaldi AE, Oberprieler RG, Clarke D, Farrell BD, Sequeira A, Ferrer MS, O'Brien C, Salzman S, Shin S, Tang W, McKenna DD (2024) The Evolutionary History of the Ancient Weevil Family Belidae (Coleoptera: Curculionoidea) Reveals the Marks of Gondwana Breakup and Major Floristic Turnovers, Including the Rise of Angiosperms. *eLife* 13:RP97552 DOI: [10.7554/eLife.97552.3](https://doi.org/10.7554/eLife.97552.3)
- Liang W and 21 others including Pierce NE (2024) To and Fro in the Archipelago: Repeated Inter-Island Dispersal and New Guinea's Orogeny Affect Diversification of *Delias*, the World's Largest Butterfly Genus. *Mol Phylogenet Evol* 194:108022 DOI: [10.1016/j.ympev.2024.108022](https://doi.org/10.1016/j.ympev.2024.108022)
- Liénard AM, Baez-Nieto D, Tsai CC, Valencia-Montoya WA, Werin B, Johanson U, Lassance J-M, Pan JQ, Yu N, Pierce NE (2024) TRPA5 Encodes a Thermosensitive Ankyrin Ion Channel Receptor in a Triatomine Insect. *iScience* 27:109541 DOI: [10.1016/j.isci.2024.109541](https://doi.org/10.1016/j.isci.2024.109541)
- Liu C, Garcia FH, Peng YQ, Pierce NE (2024) Taxonomy of the Ant Genus *Cerapachys* Smith, 1857 (Hymenoptera: Formicidae) in China with Description of a New Species. *Asian Myrmecol* 17:e017001 DOI: [10.20362/am.017001](https://doi.org/10.20362/am.017001)
- Lord A, Buckley TR, Gleeson DM, Giribet G (2024) Cryptic Species Diversity and Contrasting Climate Profiles in New Zealand Egg Laying and Live Bearing Velvet Worms (Onychophora, Peripatopsidae: *Ooperipatellus* and *Peripatoides*). *Invertebr Biol* 143:e12436 DOI: [10.1111/ivb.12436](https://doi.org/10.1111/ivb.12436)
- Losso SR, Ortega-Hernández J (2024) Conserved Exopodite Morphology in Three-Dimensionally Preserved Trilobites From the Walcott-Rust Quarry (Mohawkian, Ordovician) of New York, USA. *Arthropod Struct Dev* 81:101371 DOI: [10.1016/j.asd.2024.101371](https://doi.org/10.1016/j.asd.2024.101371)
- Loubet-Seneor K, Srivastava M (2024) Brittle Star Genome Provides Information on the Evolution of Regeneration. *Nat Ecol Evol* 8:1385–1386 DOI: [10.1038/s41559-024-02459-9](https://doi.org/10.1038/s41559-024-02459-9)
- Luque J, Bracken-Grissom HD, Ortega-Hernández J, Wolfe JM (2024) Fossil Calibrations for Molecular Analyses and Divergence Time Estimation for True Crabs (Decapoda: Brachyura). *Palaeontol Electronica* 27:a38 DOI: [10.26879/1332](https://doi.org/10.26879/1332)
- Mapalo MA, Game M, Smith FW, Ortega-Hernández J (2024) Expression of Distal Limb Patterning Genes in *Hypsibius exemplaris* Indicate Regionalization and Suggest Distal Identity of Tardigrade Legs. *EvoDevo* 15:15 DOI: [10.1186/s13227-024-00235-1](https://doi.org/10.1186/s13227-024-00235-1)

- Mapalo MA, Wolfe JM, Ortega-Hernández J (2024) Cretaceous Amber Inclusions Illuminate the Evolutionary Origin of Tardigrades. *Commun Biol* 7:953 DOI: [10.1038/s42003-024-06643-2](https://doi.org/10.1038/s42003-024-06643-2)
- Martins BdaC, Mônico AT, Mendonça C, Dantas SP, Souza JRD, Hanken J, Lima AP, Ferrão M (2024) A New Species of Terrestrial Foam-Nesting Frog of the *Adenomera simonstuarti* Complex (Anura, Leptodactylidae) from White-Sand Forests of Central Amazonia, Brazil. *Zoosyst Evol* 100:233–253 DOI: [10.3897/zse.100.110133](https://doi.org/10.3897/zse.100.110133)
- McKenna DD, Farrell BD, Marvaldi AE, Oberprieler RG, Li X (2024) Phylogenomics of Palynophagous Pine Cone Weevils (Coleoptera: Cimberididae) Recovers the Monophyly of Cimberidini and Doydirhynchini and Reveals the Paraphyly of *Cimberis*. *Eur J Entomol* 121:435–442 DOI: [10.14411/eje.2024.047](https://doi.org/10.14411/eje.2024.047)
- Mejia N, Termignoni-Garcia F, Learned J, Penniman J, Edwards SV (2024) Effects of Plastic Ingestion on Blood Chemistry, Gene Expression and Body Condition in Wedge-Tailed Shearwaters (*Ardenna pacifica*). *PeerJ* 12:e18566 DOI: [10.7717/peerj.18566](https://doi.org/10.7717/peerj.18566)
- Mignano A, Kadapa S, Drago AC, Lauder GV, Kwatny HG, Tangorra JL (2024) Fish Robotics: Multi-Fin Propulsion and the Coupling of Fin Phase, Spacing, and Compliance. *Bioinspir Biomim* 19:026006 DOI: [10.1088/1748-3190/ad1dba](https://doi.org/10.1088/1748-3190/ad1dba)
- Miller CA and 15 others including Zimkus BM (2024) Environmental Variation Predicts Patterns of Genomic Variation in an African Tropical Forest Frog. *Front Conserv Sci* 5 DOI: [10.3389/fcosc.2024.1366248](https://doi.org/10.3389/fcosc.2024.1366248)
- Montgomery DW, Zhang Y, Laronde DS, Mackinnon R, Brauner CJ, Richards JG (2024) Exposure to a Winter Photoperiod to Produce Large Atlantic Salmon Smolts (*Salmo salar*) Increases Energetic Costs and Reduces Hypoxia Tolerance During Seawater Transfer. *Aquaculture* 585:740746 DOI: [10.1016/j.aquaculture.2024.740746](https://doi.org/10.1016/j.aquaculture.2024.740746)
- Nguyen TV, Lee JL, Pauwels OSG, Kennedy-Gold SR, Poyarkov NA, David P, Vogel G (2024) The Nomenclatural Status of “*Anoplophallus maculatus*” Cope, 1895, Its Consequences on the Systematics of *Lycodon subcinctus auctorum*, and the Description of a New Species (Squamata: Colubridae). *Zootaxa* 5519:487–537 DOI: [10.11646/zootaxa.5519.4.2](https://doi.org/10.11646/zootaxa.5519.4.2)
- Pan Y, Lauder GV (2024) Combining Computational Fluid Dynamics and Experimental Data to Understand Fish Schooling Behavior. *Integr Comp Biol* 64:753–768 DOI: [10.1093/icb/icae044](https://doi.org/10.1093/icb/icae044)
- Pinheiro FL, Eltink E, Paes-Neto VD, Machado AF, Simões TR, Pierce SE (2024) Interrelationships Among Early Triassic Faunas of Western Gondwana and Laurasia as Illuminated by a New South American Benthosuchid Temnospondyl. *Anat Rec* 307:726–743 DOI: [10.1002/ar.25384](https://doi.org/10.1002/ar.25384)



- Porta AO, **Giribet G** (2024) A New Genus of Scutigera Centipede from Southern South America with the Description of Two New Species and an Updated Molecular Phylogeny of the Myriapod Order Scutigera (Myriapoda: Chilopoda). *Invertebr Syst* 38:IS24006 DOI: [10.1071/IS24006](https://doi.org/10.1071/IS24006)
- Porto W, **Derkarabetian S, Giribet G, Pérez-González A** (2024) Systematic Revision of the South American “Nuncia” (Opiliones: Laniatores: Triaenonychidae). *ZooKeys* 1207:1–149 DOI: [10.3897/zookeys.1207.120068](https://doi.org/10.3897/zookeys.1207.120068)
- Prado LP, Oliveira J, Silva NS, **Pereira TPL** (2024) Coleções Zoológicas para o Século XXI e Além. In: *Saúde Única: Saúde Humana, Animal e Ambiental* (ed Mello TRC), 1st ed. CRV: Curitiba. DOI: [10.24824/978652516591.2](https://doi.org/10.24824/978652516591.2)
- Recuero E, **Rodríguez-Flores PC, Giribet G** (2024) Surfing in the Eastern Atlantic: A New Bristle Millipede from Iberia and the Canary Islands with Insights into the Phylogeny of *Lophoproctus* (Diplopoda: Polyxenida: Lophoproctidae). *J Nat Hist* 58:422–439 DOI: [10.1080/00222933.2024.2320452](https://doi.org/10.1080/00222933.2024.2320452)
- Rees BB and 10 others including **Zhang Y** (2024) Estimating Maximum Oxygen Uptake of Fishes During Swimming and Following Exhaustive Chase—Different Results, Biological Bases and Applications. *J Exp Biol* 227:jeb.246439 DOI: [10.1242/jeb.246439](https://doi.org/10.1242/jeb.246439)
- **Richards JC, Nanglu K, Ortega-Hernández J** (2024) The Fezouata Shale Formation Biota Is Typical for the High Latitudes of the Early Ordovician—A Quantitative Approach. *Paleobiology* 50:226–238 DOI: [10.1017/pab.2024.7](https://doi.org/10.1017/pab.2024.7)
- **Rodríguez-Flores PC, Torrado H, Combsch D, Giribet G** (2024) Diversity of Squat Lobsters on Coral Reefs in Guam, Mariana Islands, with the Description of Two New Species and Notes on Their Natural History. *Mar Biodivers* 54:57 DOI: [10.1007/s12526-024-01446-4](https://doi.org/10.1007/s12526-024-01446-4)
- Santodomingo N and 10 others including **Giribet G** (2024) Integrative Taxonomy of *Tethya*: Description of Four New Species Based on Morphology, Phylogeny and Microbiome Diversity. *Syst Biodivers* 22:2383341 DOI: [10.1080/14772000.2024.2383341](https://doi.org/10.1080/14772000.2024.2383341)
- **Sarasa JL, Okamoto AS, Wright MA, Pierce SE, Capellini TD** (2024) Lions & Sea Lions & Bears, Oh My: Utilizing Museum Specimens to Study the Ossification Sequence of Carnivora Taxa. *BMC Zoology* 9:10 DOI: [10.1186/s40850-024-00201-3](https://doi.org/10.1186/s40850-024-00201-3)
- **Sato S, Derkarabetian S, Lord A, Giribet G** (2024) An Ultraconserved Element Probe Set for Velvet Worms (Onychophora). *Mol Phylogenet Evol* 197:108115 DOI: [10.1016/j.ympev.2024.108115](https://doi.org/10.1016/j.ympev.2024.108115)
- **Sato S, Derkarabetian S, Valdez-Mondragón A, Pérez-González A, Benavides LR, Daniels SR, Giribet G** (2024) Under the Hood: Phylogenomics of Hooded Tick Spiders (Arachnida, Ricinulei) Uncovers Discordance Between Morphology and Molecules. *Mol Phylogenet Evol* 193:108026 DOI: [10.1016/j.ympev.2024.108026](https://doi.org/10.1016/j.ympev.2024.108026)
- Schwartzman JA and 20 others including **Giribet G** (2024) Global Diversity of Enterococci and Description of 18 Previously Unknown Species. *Proc Natl Acad Sci USA* 121:e2310852121 DOI: [10.1073/pnas.2310852121](https://doi.org/10.1073/pnas.2310852121)
- **Silva FLD, de Medeiros BAS, Farrell BD** (2024) Once Upon a Fly: The Biogeographical Odyssey of *Labrundinia* (Chironomidae, Tanypodinae), an Aquatic Non-Biting Midge Towards Diversification. *Mol Phylogenet Evol* 194:108025 DOI: [10.1016/j.ympev.2024.108025](https://doi.org/10.1016/j.ympev.2024.108025)
- **Sin SYW, Ke F, Chen G, Huang P-Y, Enbody ED, Karubian J, Webster MS, Edwards SV** (2024) Genetic Basis and Evolution of Structural Color Polymorphism in an Australian Songbird. *Mol Biol Evol* 41:msae046 DOI: [10.1093/molbev/msae046](https://doi.org/10.1093/molbev/msae046)
- Stringer EJ, Gruber B, Sarre SD, Wardle GM, **Edwards SV, Dickman CR, Greenville AC, Duncan RP** (2024) Boom-Bust Population Dynamics Drive Rapid Genetic Change. *Proc Natl Acad Sci USA* 121:e2320590121 DOI: [10.1073/pnas.2320590121](https://doi.org/10.1073/pnas.2320590121)
- Suchan T, Bataille CP, Reich MS, Toro-Delgado E, Vila R, **Pierce NE, Talavera G** (2024) A Trans-Oceanic Flight of Over 4,200 km by Painted Lady Butterflies. *Nat Commun* 15:5205 DOI: [10.1038/s41467-024-49079-2](https://doi.org/10.1038/s41467-024-49079-2)
- **Swain A, Azevedo-Schmidt LE, Maccracken SA, Currano ED, Meineke EK, Pierce NE, Fagan WF, Labandeira CC** (2024) Interactive Effects of Temperature, Aridity, and Plant Stoichiometry on Insect Herbivory: Past and Present. *Am Nat* 204:416–431 DOI: [10.1086/731995](https://doi.org/10.1086/731995)
- Thiers B and 10 others including **Edwards SV** (2024) Duke’s Herbarium Merits Continued Enhancement, Not Dissolution. *BioScience* 74:507–508 DOI: [10.1093/biosci/biae031](https://doi.org/10.1093/biosci/biae031)
- Thomas GWC, **Gemmell P, Shakya SB, Hu Z, Liu JS, Sackton TB, Edwards SV** (2024) Practical Guidance and Workflows for Identifying Fast Evolving Non-Coding Genomic Elements Using PhyloAcc. *Integr Comp Biol* 64:1513–1525 DOI: [10.1093/icb/icae056](https://doi.org/10.1093/icb/icae056)
- **Valencia-Montoya WA, Pierce NE, Bellono NW** (2024) Evolution of Sensory Receptors. *Annu Rev Cell Dev Biol* 40:353–379 DOI: [10.1146/annurev-cellbio-120123-112853](https://doi.org/10.1146/annurev-cellbio-120123-112853)
- von Konrat M and 64 others including **Maier C** (2024) From Spectators to Stewards: Transforming Public Involvement in Natural History Collections. *NHCM* 1:1–33 DOI: [10.3897/nhcm.1.138247](https://doi.org/10.3897/nhcm.1.138247)
- Wainwright DK, **Lauder GV, Gemmell BJ** (2024) Hydrodynamic Function of the Slimy and Scaly Surfaces of Teleost Fishes. *Integr Comp Biol* 64:480–495 DOI: [10.1093/icb/icae066](https://doi.org/10.1093/icb/icae066)
- **Wang Z, Huben R, Boucher PB, Van Amburg C, Zeng J, Chung N, Wang J, King J, Knecht RJ, Ng’iru I, Baraza A, Baker CCM, Martins DJ, Pierce NE, Davies AB** (2024) Automated Detection of an Insect-Induced Keystone Vegetation Phenotype Using Airborne LiDAR. *Methods Ecol Evol* 15:978–993 DOI: [10.1111/2041-210X.14298](https://doi.org/10.1111/2041-210X.14298)
- **Wang Z, Kim S, Farrell BD, de Medeiros BAS** (2024) Customizable PCR-Based Target Enrichment Probes for Sequencing Fungi-Parasitized Insects. *Insect Sci* 32:719–724 DOI: [10.1111/1744-7917.13413](https://doi.org/10.1111/1744-7917.13413)
- **White CF, Lauder GV** (2024) Studying Animal Locomotion with Multiple Data Loggers: Quantifying Time Drift Between Tags. *Anim Biotelemetry* 12:5 DOI: [10.1186/s40317-024-00363-4](https://doi.org/10.1186/s40317-024-00363-4)
- **Wolfe JM** and 22 others including **Luque J, Ortega-Hernández J** (2024) Convergent Adaptation of True Crabs (Decapoda: Brachyura) to a Gradient of Terrestrial Environments. *Syst Biol* 73:247–262 DOI: [10.1093/sysbio/syad066](https://doi.org/10.1093/sysbio/syad066)
- **Wright MA, Cavanaugh TJ, Pierce SE** (2024) Volumetric Versus Element-Scaling Mass Estimation and Its Application to Permo-Triassic Tetrapods. *Integr Org Biol* 6:oba034 DOI: [10.1093/iob/oba034](https://doi.org/10.1093/iob/oba034)
- Wu S and 12 others including **Edwards SV** (2024) Genomes, Fossils, and the Concurrent Rise of Modern Birds and Flowering Plants in the Late Cretaceous. *Proc Natl Acad Sci USA* 121:e2319696121 DOI: [10.1073/pnas.2319696121](https://doi.org/10.1073/pnas.2319696121)
- Wu S and 12 others including **Edwards SV** (2024) Reply to Claramunt et al.: Robustness of the Cretaceous Radiation of Crown Aves. *Proc Natl Acad Sci USA* 121:e2412448121 DOI: [10.1073/pnas.2412448121](https://doi.org/10.1073/pnas.2412448121)
- Wu S and 12 others including **Edwards SV** (2024) Reply to Springer and Gates: The Impact of Long Branches and Misalignments on Phylogenetic Analysis Is Minimal. *Proc Natl Acad Sci USA* 121:e2409344121 DOI: [10.1073/pnas.2409344121](https://doi.org/10.1073/pnas.2409344121)
- **Zhang Y** (2024) Cardiorespiratory and Circulatory Responses of Digestion. In: *Encyclopedia of Fish Physiology, vol. 2* (eds. Alderman SL, Gillis TE). Elsevier, Academic Press.
- **Zhang Y** (2024) Cost of Digestion and Assimilation. In: *Encyclopedia of Fish Physiology, vol. 2* (eds. Alderman SL, Gillis TE). Elsevier, Academic Press.
- **Zhang Y, Anttila K, Hickey AJ** (2024) Exploring the Developmental Plasticity and Transgenerational Effects on the Thermal Biology of Aquatic Ectotherms. *Front Physiol* 15:1507027 DOI: [10.3389/fphys.2024.1507027](https://doi.org/10.3389/fphys.2024.1507027)
- **Zhang Y, Ko H, Calicchia MA, Ni R, Lauder GV** (2024) Collective Movement of Schooling Fish Reduces the Costs of Locomotion in Turbulent Conditions. *PLoS Biol* 22:e3002501 DOI: [10.1371/journal.pbio.3002501](https://doi.org/10.1371/journal.pbio.3002501)
- **Zhang Y, Lauder GV** (2024) Energy Conservation by Collective Movement in Schooling Fish. *eLife* 12:RP90352 DOI: [10.7554/eLife.90352.3](https://doi.org/10.7554/eLife.90352.3)



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MCZ Faculty

The MCZ's charter, signed in 1859, mandates that the Museum's activities will be overseen by a governing board, the Faculty of the Museum of Comparative Zoology.

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