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Welcome

Welcome to 2021! The previous year has been tumultuous to say the least, so I am optimistically looking forward to better things to come. Although we are not out of the woods yet, the Board of Directors are working on plans for the 50th meeting of NASBR in Tempe, Arizona, as vaccines give hope that our efforts against the coronavirus pandemic are headed in the right direction. We will give updates via emails and on our website, so keep in touch. One positive highlight from 2020 was our first virtual webinar on November 20. We got to reminisce over the last five decades with insightful, humorous, and inspirational messages from our invited speakers that will guide us into the next decade. There were also short presentations on three of the 21 chapters in the celebratory book marking the half-century of NASBR, "50 Years of Bat Research: Foundations and New Frontiers". The editors have reviewed the galley proofs so it should be published in January 2021. Another reason for periodically checking www.nasbr.org for information on ordering copies and a link to the recording of the virtual event. The Board will also be addressing options for getting our Society in a stronger financial position to weather unforeseen events that can jeopardize our fiscal situation. For example, the Finance Committee is looking into safe investments to earn some interest on our assets, such as donations to awards and establishing them as endowment funds in perpetuity. Don't forget to nominate one of our many great early to mid-career bat researchers for the inaugural Thomas H. Kunz Recognition Award. The nomination deadline is May 1 and more information is available on the website link <https://www.nasbr.org/awards>. The awardee will be announced at our 50th symposium in Tempe on October 20-23, 2021, so mark this in your calendar. Stay safe, stay well, and follow the advice of your public health authorities.

~ Burton Lim
NASBR Board Chair

In Focus

Anyone who has seen a mother interact with their infant child is familiar with the concept of "motherese", even if you have never heard of that term. Motherese is defined as infant-directed speech produced by adults, and is known to have unique vocal characteristics, such as higher pitch and slower speech speed, compared to adult-directed vocalizations. The function of motherese in humans is to encourage both vocal and social development. Despite motherese being a well-established concept in psychology, little work has focused on whether such vocalizations occur in non-human animals, and no work outside of humans has addressed if the timbre, or tonal 'color', of infant-directed social calls are unique from other types of vocalizations. This is the focus of the new paper by Ahana Aurora Fernandez and Mirjam Knörnschild recently published in *Frontiers in Ecology and Evolution*.



Photo by Michael Stifter

In this study, Fernandez and Knörnschild focus on the maternal directive calls (MDs) of adult greater sac-winged bats, *Saccopteryx bilineata*. The authors characterized the MDs and other tonal social calls (which are directed towards adults) of adult females from long-term study populations in Central America. They found that pup-directed and adult-directed calls differed significantly in multiple acoustic features, including aspects of call frequency and timbre (as characterized by an LFCC analysis). This finding supports the hypothesis of motherese existing in greater sac-winged bats. Interestingly, the authors also documented for the first time a pup-directed vocalization produced by adult males that is similar in structure to pup isolation calls (ICs). Pup ICs are known to have a group-specific signature, and Fernandez and Knörnschild show that the ICs of pups are more similar to the calls of adult males within their social group compared to those outside of their social group. This finding suggests that male pup-directed calling may play a role in development of a group signature in ICs. Overall, these exciting findings demonstrate that communication between adults and juveniles within a social group are more complex than we originally thought, and that both male and female adults play important roles in the vocal development and learning of pups.

Learn more about this fascinating study [here](#).

~ Erin Gillam

issued several statements in support of expanding inclusion in bat biology and backing broader movements to battle racism and discrimination. With the help of an anonymous donor and funding drives from other members, the DEI Committee is now working toward establishing a new award to encourage participation from underrepresented groups in our annual meeting. While this award is only beginning to take shape, it will be used to encourage local teachers, students, and conservation organizations to attend our meetings by covering a portion of their travel, lodging, and registration costs. We hope that this will open new opportunities to expand participation of interested groups in our meeting. The Board is also soliciting ideas from the general membership how to best apply this award in the future.

Our Society's strength comes from its openness, inclusion, and transparency and we encourage all members to share in the common goal of supporting underrepresented groups in our meeting and in science. The DEI Committee is open to all members of NASBR, and The Board encourages participation of all members, especially students, in this group. Our efforts toward building inclusion in NASBR will benefit from varied perspectives, opinions, and unique ideas from our diverse membership.

If you would like to join the DEI Committee or have suggestions for the Board, please contact Heather York, Chair of the DEI Committee, or Burton Lim, Chair of the NASBR Board.

~ Nate Fuller, NASBR Board Member

NASBR News

Introduction to the Diversity, Equity, and Inclusion Committee

It goes without saying that 2020 was a tumultuous year in many respects. In the midst of the greatest public health crisis in a generation, there was worldwide upheaval following the killings of George Floyd, Breonna Taylor, and countless other victims of excessive police action. Meanwhile, the Trump Administration's travel restrictions and changes to the student visa program left many talented scientists (including those in our membership) in regulatory limbo. Events such as these highlighted the need for NASBR to speak out against systemic racism and discrimination. During the 2018 meeting in Puerto Vallarta, the Board voted to establish a new Diversity, Equity, and Inclusion (DEI) Committee, chaired by Board Member Heather York, to spearhead our Society's response to these complicated issues.

Through the work of the DEI and Policy Committees, The Board has taken action to address issues of inclusion. NASBR



Illustration by Allison Brokaw

Students, Want to Get Involved in NASBR? Read Here!

Students, get involved! Are you a student member of NASBR and want to be involved, but don't quite know how? The NASBR community has many different ways you can be involved, while not adding on too much of a burden into your schedule. Here are some ways to become more active in the society.

A great, low stress, way to be involved as a student is to be a part of a committee or sub-committee! Committees range from being involved with writing statements and resolutions with the Policy and Public relations committee, helping increase the diversity of the society with the [NEW!] committee on Diversity, Equity, and Inclusion, or help with social media. If you're unsure of how to find out information about the different committees in NASBR, feel free to reach out to your student representatives Lexi Brown or Dana Green!

Speaking of student representatives, if you are excited to be heavily involved with NASBR, consider putting your name in the running to be a student representative! As a student rep, you will have the opportunity to vote on important board decisions, organize student events at the yearly meeting, and more.

Other ways to be involved and recognized in the NASBR community, is to apply for the variety of student awards. NASBR advertises nine different student awards at <https://www.nasbr.org/student-awards> with awards ranging from scholarships to research equipment awards. There you can find award offers from Titley Scientific, Bat Conservation International, and Avinet! Many of your research needs could be covered by these opportunities, and it is always worth applying as a student researcher.

If you are a student who is reaching the end of a program, whether an undergraduate degree or a graduate degree, then we are also here to help encourage you toward the next steps of your bat research career! Are you interested in the influence on climate change on bat communities? Check out the work of Dr. Gerald Kerth in Germany! He is currently advertising PhD positions and it would be an exciting opportunity to discover



Diversity Breakfast at Kalamazoo 2019

NASBR Stories

more about european species. We regularly post opportunities on our platforms, so stay tuned for more!

~ Dana Green, NASBR Student Board Member

A Recap of the Launch for the NASBR 50th Anniversary Webinar Celebration and Book Launch

Although NASBR 2020 in Tempe, AZ was cancelled due to the Covid-19 pandemic, that didn't keep our society from celebrating its 50th anniversary! On November 20th, 2020, NASBR hosted a webinar entitled "Our Half-Century Celebration" as a Zoom event that was open to all. The webinar had a dual function - to celebrate NASBR's 50th year as a society and to launch the celebratory volume entitled "50 Years of Bat Research," which is being published to honor the milestone.

The webinar featured an introduction from the Chair of the NASBR Board of Directors, Dr. Burton Lim, followed by a session entitled "Five Decades of NASBR", which was moderated by Dr. Gary Kwiecinski. In this session, a brief overview of what was happening with NASBR and bat research during each of the society's five decades was given by a bat biologist and NASBR member who was a student during that decade. Dr. Brock Fenton presented the 1970s, Dr. Rick Adams presented the 1980s, Dr. Jorge Ortega presented the 1990s, Dr. Tigga Kingston presented the 2000s, and Dana Green - a current PhD student - presented the 2010s. Overall, the session gave a fascinating overview of how bat research has changed over the last 50 years.

The second session of the webinar highlighted work from three chapters in the "50 Years of Bat Research" celebratory volume. Dr. Winifred Frick presented an overview of her chapter (co-authored with Russell and Gillam), about how the role of women has changed in NASBR over the years. The second speaker was Dr. Juan Moreira-Hernandez, who discussed his chapter (co-authored with Calderón-Acevedo and Muchhala) that examined advances in our understanding of nectarivorous bats over the last half century. Finally, Dr. Danny Haelewaters discussed his chapter (co-authored with Dick, Cocherán Pittí, Dittmar, and Patterson) about our understanding of the tripartite system of parasitism that includes bats, their bat fly parasites, and the parasitic fungi that attack bat flies.

We look forward to continuing our 50th year celebrations - albeit, a year late - at the 2021 conference in Tempe, Arizona!

A full recording of the webinar can be found at: <https://www.nasbr.org/50th>

~ Erin Gillam

What are Your Earliest NASBR Experiences? Tales from the NASBR Membership

50 years! North America's bat researchers, conservationists, and enthusiasts have been coming together to talk all things bats for 50 years. While 2020 may have delayed our 50th meeting of the North American Symposium of Bat Research, we want to hear your NASBR stories. Please continue to submit your 'Bat Stories' via the submission form found [here](#). The following are a taste of some of the wonderful memories, friendships, and adventures our bat community has cultivated over the last half-century!

~Riley Bernard, Associate Program Director



***Euderma maculatum* - Faith Walker**

I have many favorite memories of bat research including handling an *Idionycteris phyllotis* on my first night netting, walking up to a cave's entrance just as a black bear blasted out, and the moment it was clear that we successfully sequenced DNA from a 2,100 year old spotted bat mummy. My favorite NASBR memories are the fun conversations at the poster sessions.

~Faith Walker, Northern Arizona University

My favourite memory of NASBR was in 2019 in Kalamazoo when I got to meet and have a mentor lunch with Merlin Tuttle. That same year most of the Barclay bat lab that was at NASBR got together for a photo!

My favourite memory of bat research is the 4 years I spent in Dominica. It's the most beautiful lush island you can imagine and it has a great diversity of bat species including *Noctilio leporinus*, which is definitely one of the most amazing bats. It took me two years to catch it but I finally did! I also had so much fun teaching students about bats and working with



**My first capture of *Noctilio leporinus* in Dominica
- Lisa Sims**



**Monseratt, looking south where many of my sites used to be - now covered by tephra (photo by Peter Larsen)
- Scott Pedersen**

Well... least favorite memory was having most of my field sites destroyed by an active volcano on the island of Montserrat (British West Indies) but this led to my most favorite memory/ realization that I now had a spectacular opportunity to evaluate how different bat taxa respond to such stressors.

~Scott Pedersen, South Dakota State University

I remember with great fondness NASBR 24 held in Ixtapa Mexico in 1994. The hotel was glorious with small swimming pools on the balcony, body surfing on the great beach, bats to be netted on the hotel property, tree frogs on the walls outside rooms and the most fabulous desserts in the restaurant. To this day, my wife has not forgiven me for failing to take her along. But perhaps the best memory was sitting with Robert Barclay in one of the many swimming pools late one afternoon after the sessions and hatching a plan to host a small symposium on bats and forests. The plan was stimulated by all the talks and posters at the meeting focused on bat's use of forests for roosting and foraging. Our little symposium happened a year later during October in Victoria, BC (NASBR was part of an International meeting in the summer that year) and over 100 people showed up. I am proud that the proceedings from the meeting were published within a year (Barclay and Brigham 1997).

~Mark Brigham, University of Regina



Rob Schorr (CSU/Climbers for Bat Conservation) sharing bats with rock climbers near Devil's Head, Colorado

My favorite memory of bat research, which probably resonates with many bat biologists, is the first time I held a bat. To see a bat, an evening bat in this case, and feel the patagium, see their unimaginably long fingers, and release them and watch them fly. That's all it took for me to know that's what I wanted to do. I distinctly remember saying out loud, incredulously, "I'm in a Georgia river catching bats". It's one of those "aha" moments that's infectious and you see your career before it's arrived. I'm unapologetically in love with bats, and I'm grateful that I have the opportunity to study them.

~Robert Schorr, Colorado State University

Local Host Report: Recap of the 2019 NASBR Meeting in Kalamazoo, Michigan



Logo created by Jady Morelli

The 2019 North American Society for Bat Research convened their annual symposium in Kalamazoo, Michigan, at the Radisson Plaza Hotel from Wednesday October 23rd through Saturday October 26th. Field trips started on Tuesday with a trip to the Field Museum of Natural History in Chicago, Illinois, and a trip to the Saugatuck Dunes State Park and Allegan State

Game Area on Wednesday. Local hosts Amy Russell and Maarten Vonhof worked closely with program directors Riley Bernard, Gary Kwiecinski, Shahroukh Mistry, Luis Viquez-R, and Emma Willcox for the attendance of 380 registrants. The registrants represented nine countries, including Brazil, Canada, China, Costa Rica, Germany, Mexico, UK, USA, and Vietnam. There were 133 oral papers (40 student and 93 regular), 76 posters (34 students and 42 regular) for a total of 209 presentations. The 380 registrants comprised 143 students, 217 regular, 12 exhibitor, and 8 volunteer attendees.

Local committee: Amy Russell, and Maarten Vonhof. Registration volunteers included Leona Addie, Justin Boyles, Jacob Brand, Veronica Brown, Jessica Dreyer, Keith Dreyer, Erika Forest, Nate Fuller, Edgar Gutierrez, Reilly Jackson, Randi Lesagonicz, Lydia Olson Nixon, Nicolette Sexton, Aja Sherman, and Stephanie Stanton. The NASBR 2019 meeting logo was designed by Jady Morelli, wife of Amy Russell, and the NASBR 2019 t-shirt logo was designed by graphic design students at Western Michigan University.

We are grateful to all of the conference sponsors – Wildlife Acoustics, Titley Scientific, Pettersson, Lotek Wireless, Environmental Solutions and Innovations, Critter Catchers, Propestmen, ERM, Bat Conservation International, Avinet, Lubee Bat Conservancy, Speleobooks, the Indiana State University Center for Bat Research, Outreach, and Conservation, Grand Valley State University, and Western Michigan University.

Pre-conference events: Fourteen people attended a day trip to the Field Museum of Natural History on Tuesday. The museum donated entrance passes for trip attendees, and Bruce



Kalamazoo local co-host, Amy Russell in front of a banner designed by Western Michigan University Students



Teacher Workshop at Kalamazoo 2019

Patterson led a tour of the collections. On Wednesday, sixteen people visited the west Michigan dunes ecosystems in a guided hike led by Nate Fuller, Executive Director of the Sarett Nature Center. The dunes trip started with a hike at Saugatuck Dunes State Park, followed by an optional second hike at the Allegan State Game Area. The Spallanzani fundraiser was a success, with 24 people registering to join a bowling extravaganza. Volunteers Leona Addie, Jacob Brand, and Randi Lesagonicz played a key role in transporting people to various events on Wednesday.

Diversity breakfast: At least 120 people attended a breakfast on Friday morning to discuss issues regarding diversity in science. Inspired by Carol Chambers' keynote talk, breakfast organizers Winifred Frick, Erin Gillam, and Amy Russell asked attendees to engage in small-group discussions focusing on ways in which members can improve diversity, equity, and inclusion at NASBR and at their home institutions.

2019 Teacher Workshop Summary

Veronica Brown, with the help of local outreach expert Aja Sherman, coordinated the annual Teachers Workshop for 12 local teachers and wildlife educators. Dr. Al Kurta (Professor at Eastern Michigan University) spoke on bats of Michigan, while Dr. Kristen Lear (BCI's endangered species interventions specialist) Skyped in to demonstrate for teachers some of the online tools being utilized by many of NASBR's researchers. Erin Parker from the Detroit Zoological Society spoke on a local citizen science acoustic monitoring project, while David Clipner from the Leslie Nature Center and local teacher Matt Sherman discussed pollinator gardens. David Clipner also brought live bats to demonstrate how they can be used to provide up close and personal experiences in classrooms. Thanks to donations of materials from many resources, the largest of which being

Awards Gerrit S. Miller Award

Dr. Gerald Wilkinson



At the 2019 meeting in Kalamazoo, Michigan Professor Gerald (Jerry) Wilkinson was recognized with the Gerrit S. Miller Jr Award for his outstanding contributions to the field of chiropteran biology. Jerry and his students have made major contributions to our understanding of social behavior, sexual selection, and communication in bats, and the role of genetic relatedness in social evolution. His research has also provided major contributions to our understanding of how bats achieve their extreme longevity, and established bats as model systems to understand the genetic basis of aging.

Jerry received his bachelor's degree from the University of California, Davis and his PhD in the Department of Biology at the University of California, under the supervision of Dr. Jack Bradbury. His PhD research on reciprocal food sharing in vampire bats, which was published in *Nature* while Jerry was still a doctoral student, is a true classic in the literature on bats. Following completion of his PhD, Jerry was a Postdoctoral Fellow at the University of Sussex and then at the University of Colorado, Boulder. Jerry is currently Professor in the Department of Biology and Associate Dean in the College of Computer, Mathematical and Natural Sciences at the University of Maryland, College Park. In his career, Jerry has authored over 150 peer-reviewed papers, with many papers in first-tier journals. In addition to his seminal contributions to research on bats, Jerry's lab has

maintained a very productive research program employing stalk-eyed flies in investigations of the evolutionary genetics of sexual selection. His contributions to bat research extend through the contributions of the many students that Jerry has mentored, many of whom are active in NASBR and the bat research community. NASBR was very proud and pleased for Jerry to receive the Miller Award, as it is very much deserved!

~ Gary McCracken

Kalamazoo 2019

people enjoyed interacting with Dr. Thong and that his presence enriched our annual conference. We look forward to hearing more about Dr. Thong's important research in the future!

~ Erin Gillam

Spallanzani Award



In 2019, NASBR was excited to award the Spallanzani fellowship to Dr. Vu Dinh Thong from Vietnam. The Spallanzani Fellowship is awarded to exceptional scientists who have made meritorious accomplishments that promote bat research, education, and/or conservation programs in their country. Dr. Vu Dinh Thong is an Associate Professor of Biology and Head of the Zoological Museum at the Institute of Ecology and Biological Resources in the Vietnam Academy of Science and Technology. Dr. Thong's research focuses on the conservation and ecology of Vietnamese mammals. Specific research projects include resolving taxonomic discrepancies within the hipposiderids, documenting the echolocation systems of little studied species, and describing 10+ new bat species. Dr. Thong has published more than 80 papers and has been a member of the Steering Committee of the Southeast Asian Bat Conservation Research Unit (SEABCRU). At the 2019 NASBR meeting in Kalamazoo, Dr. Thong gave a fascinating presentation entitled "Bats of Vietnam: An Overview of Research and Conservation". In his talk, Dr. Thong discussed his journey of studying bats in Vietnam, beginning in 1997 when he was the only bat specialist in the country. He discusses how his work has led to the development of action plans focused on conserving the bats of Vietnam - something that is critically important in the face of increasing habitat loss and illegal hunting. Overall, it was a great pleasure to have Dr. Thong in attendance at NASBR 2019. While we certainly hope that the experience of attending NASBR was a great one for him, we definitely know that many

Bernardo Villa Award



It has been a very difficult year in many ways due to the pandemic that we are currently experiencing, this has considerably affected our activities, including the suspension of the 50th Annual Meeting of NASBR and consequently the cancellation of the Bernardo Villa 2020 award. For the year 2019 Eight undergraduate and graduate students from different universities in the interior of Mexico, as well as CDMX, participated. The winner of the 2019 edition of the Bernardo Villa award was Biol. Yocelyn Gutiérrez Guerrero with the subject of her doctoral thesis entitled: Evolutionary genomics of the diversification of diets in the Phyllostomidae family and the genomic signals related to the evolution of nectarivory. Yocelyn is associated with the Department of Evolutionary Ecology under the direction of Dr. Luis Eguiarte. Yocelyn was selected by three judges from Latin America and USA that reviewed and selected the top project to be awarded. She attended the annual meeting in Kalamazoo, Michigan, and presented her work during the opening ceremony of the 49th NASBR Meeting. Currently, Yocelyn is in the process of defending her doctoral thesis and continuing her preparation with a postdoctoral stay abroad, where she will focus her knowledge of evolution and molecular biology with other species of bats.

~ Jorge Ortega Reyes

Student Awards Oral Presentations

Bat Conservation International

Emma L. Kunkel

Partial Migration in Mexican Free-tailed Bats: Ecology and Bioenergetics of Winter Residents.

Bat Research News Award

Alexander T. Grimaudo

Host and Environment Interact to Drive Colony Persistence of *Myotis lucifugus* Impacted by White-nose Syndrome. Broadly, my research interests are in the ecological and evolutionary drivers of host population response to emerging infectious diseases. For my dissertation, I am investigating the mechanisms by which North American bat populations are either driven to extinction by white-nose syndrome, or stabilize and persist with the disease. In 2019, I presented my research at NASBR exploring how populations of little brown bats, *Myotis lucifugus*, have stabilized despite continuing to be infected by *Pseudogymnoascus destructans*, the fungus that causes white-nose syndrome. I presented evidence that *Myotis lucifugus* in these populations have unique host characteristics conducive to surviving the disease, but that they interact strongly with environmental conditions within hibernacula such that they offer imperfect protection. Together, these findings are not only encouraging for the future of this species, but they provide much-needed information for the successful management and conservation of bat populations impacted by white-nose syndrome. I was honored and thankful to receive the Bat Research News Award for my research and presentation, and it was encouraging to me as an early-career scientist. I plan to use the award to fund my travel to the next NASBR meeting that can be attended in-person.

Karl F. Koopman Award

Iroko Tanishi

Competitors versus Filters: Drivers of Non-random Structure in Forest Interior Insectivorous Bat Assemblages Along Elevational Gradients. My doctoral research investigates the drivers of non-random structure in forest understory insectivorous bat assemblages along elevational gradients in southeastern Nigeria. Bat species richness decreases monotonically with increasing elevation in the Afrotropics, being driven by temperature and water availability – factors that change strikingly on mountains. However, the role of mechanistic drivers i.e. competition and filtering on bat species richness patterns along elevational gradients is poorly understood. To address this question, I employ an ecomorphological approach by modelling traits:

wing morphology, body mass and bite-force in multivariate trait space. Coexistence in hyper diverse tropical areas is influenced by several structuring mechanisms; on the one hand, sympatric bat species likely partition resources to avoid direct competition. On the other hand, environmental factors also limit species occurrence by allowing only those with requisite traits to “pass through” filters (environmental factors) that are directly or indirectly linked to energy budget (metabolism/prey availability) or access to prey items (foraging space) e.g. temperature and vegetation clutter respectively. Our results suggest that competition and environmental filtering simultaneously drive bat species richness along elevational gradients in southeastern Nigeria. Receiving the Karl Koopman award in biogeography was an incredible honor and career dream come true. I will use the award funds to cover tuition expenses in the final year of my dissertation.



Luis F. Bacardi Bat Conservation Award

Luis Viquez-R

Gotta Catch ‘em All! Using PNA-DNA Clamps to Increase Microbiome Read Numbers in a Diet Specialist. I’m a PhD candidate in the Evolutionary Ecology and Conservation Genomics Institute at the university of Ulm in Germany. My work relates to how migration and dietary changes relate to changes in immune response in the Tequila Bat (*Leptonycteris yerbabuenae*). For this project, we developed a set of PNA-DNA clamps to improve the yield of microbiome sequences in the faecal samples of the bats.



Titley Electronics Award

Timothy J. Divoll

Flexibility of Prey Size Selection in Sympatric Forest Bats (*Myotis*) Facilitates Dietary Overlap.

My research focuses on the foraging ecology of Indiana bats and northern long-eared bats, combining spatial and molecular methods to learn what these species are eating, where they are feeding, and how they are using forested landscapes. With radio telemetry and eDNA, we were able to quantify individual foraging ranges and dietary compositions and make comparisons between populations of these species in managed state forests and riparian-agricultural forests of central Indiana, USA. We found that both species eat an astounding number of insects, with Indiana bats using more space than northern long-eared bats. I am grateful to receive this award, which was inspiring as I finished the analysis and writing of my doctoral research. The award funds were used to help cover fees during my last semester at Indiana State University while I finalized my dissertation.



Poster Presentations

Avinet Award

Alexander (Sasha) T. Morris.

Kinematic Comparison of the Recovery Maneuvers Between Two Bat Species.

I have always been intrigued by the complex neuromuscular control that bats across the globe use to navigate their wide-ranging and often unpredictable environments. Part of my research has involved characterizing the flight kinematics of a range of bat species, including *Carollia perspicillata* and *Rousettus aegyptiacus*. When we disturb their steady forward flight with a gust of wind, we can monitor their recovery maneuvers using high speed video recordings. In one study comparing the flight kinematics of these two bat species for which I presented a poster at NASBR, we hypothesized that the perturbation would induce similar kinematic disturbances between the two

Kalamazoo 2019

species and that they would recover in similar ways, if these factors were governed solely based on the linearly scaling passive dynamics of their wing and body mass. Interestingly, we found that the smaller *C. perspicillata* experienced more total body rotation characterized by different patterns of rotation. This implies that factors such as specific wing morphology and neural structure may play a role in dynamic flight stabilization, and that natural environments may have exerted selective evolutionary pressure on these factors. It was an honor to receive this award, and I am currently using the funds to contribute to an ongoing study, where we are exposing bats to both laminar and turbulent flow in a wind tunnel and recording the kinematics and neuromuscular control of their flight using high speed cameras and electromyography. We hope to develop novel insights into the neuromuscular mechanisms of controlling and recovering from unsteady flight.



Batgoods Award

Derek T. Krueger

Observing Social Behaviors of *Eptesicus fuscus* Within the Roost.

My research project examined the social behaviors of big brown bats (*Eptesicus Fuscus*) in the roost. More specifically, I investigated potential dominant and submissive relationships between individuals within a captive colony. This was done by scoring individual positions within the huddle of bats in videos taken across a six-week period. Data was then analyzed to see if cluster position varied for different individuals throughout the study. In the end, no preference was found between individuals and position within the roost. However, the study still helps shed some light on roost behavior in *Eptesicus fuscus*, and follow-up studies characterizing more behaviors within the roost would be valuable. I'm so thankful and honored to have received the

Juan Moreira-Hernandez

Using Prepared Nectarivorous Bat Specimens for Pollination Studies: An Example with Bat-pollinated *Burmeistra* (Campanulaceae) from Equador.

For my PhD dissertation, I am studying how bat pollinators influence the evolution and coexistence of bat-pollinated plants. Nectarivorous bats often carry pollen from multiple plant species simultaneously so bat-pollinated flowers sometimes receive mixed pollen loads. Aren't the plants affected? We studied this using nectarivorous bat specimens (*Anoura geoffroyi*) from a teaching collection loaded with mixed pollen loads from two co-flowering species of *Burmeistra* (Campanulaceae) in a reciprocal experiment. We found that one species that commonly experience mixed pollen loads in natural conditions showed no negative effects whereas its congener, which rarely receives mixed pollen loads, was negatively affected. This differential tolerance to each other's pollen may facilitate the coexistence of these two species by alleviating the costs of sharing their bat pollinators. Our study shows that nectarivorous bat specimens are useful for pollination studies and suggests that tolerance to mixed pollen loads might be common among bat-pollinated plants. I am very honored to have received the Basically Bats award for this study and the support helped me defray the costs of attending NASBR 2019.



White-nose Syndrome Research Award

Brooke Daly

Sex Ratios of Big Brown Bats in Michigan Over a 10-Year Period.

My research interests are varied within the bat world and are not limited to conservation, disease ecology, spatial analysis, and behavior. As a master's student at Eastern Michigan University, I was able to access 10 years of data on over 12,000 big brown bats within the state that had been tested for rabies. This data showed a disproportionate sex ratio in *Eptesicus fuscus*, with males greatly outnumbering females. This abundance of males is most apparent during and around maternity season. Presenting on this topic at Kalamazoo was an amazing experience and allowed me to be part of a greater discussion within the NASBR community. I was ecstatic to receive this award, and it was the highlight of my year. The funds from my award were able to go toward my thesis research, which focuses on white-nose syndrome in little brown bats.

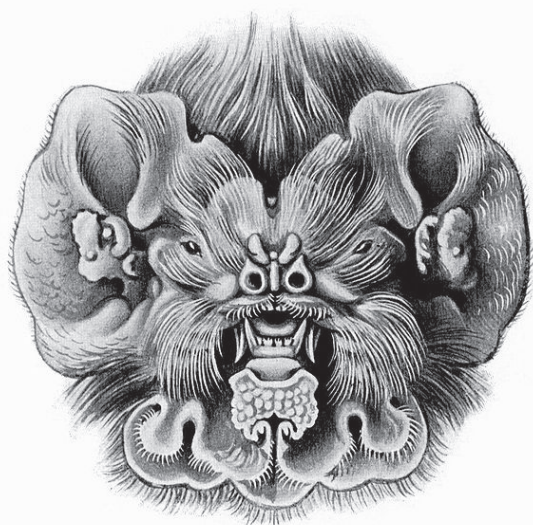


John Winkelmann – John Winkelmann was emeritus professor of biology at Gettysburg College. He served on the NASBR Board from 2007 – 2010 and was the third lifetime membership recipient for our society. His work spanned 5 continents (North America, South America, Africa, Asia, and Australia) and focused on the movement ecology and behavior of bats.

Thomas Kunz – Tom Kunz was William Fairfield Warren Distinguished Professor and Director of the Center for Ecology and Conservation Biology at Boston University. Tom authored, coauthored, and edited over 300 peer-reviewed papers and several books on bat ecology. He received numerous awards throughout his career including the Gerrit S. Miller Award from our society in 1984, the C. Hart Merriam Award from the American Society of Mammalogists, and was an elected fellow of AAAS.

Joe Burns – Joe Burns was a professional wildlife biologist and technology transfer specialist for the US Forest Service. Joe was a champion of conservation biology through his commitment to societies such as Society for Conservation Biology (SCB) and The Wildlife Society. A scholarship fund for student members of SCB has been founded in Joe's honor.

Kathy Shelton – Kathy Shelton was a biologist with the Mississippi Department of Wildlife, Fisheries, and Parks. Kathy is remembered for her outreach efforts and as a voice for understudied species, including bats. Linda Angerer – Linda Angerer was a wildlife biologist for the US Forest Service for 40 years. She worked in the Eldorado National Forest and Mendocino National Forest and served as the Region 5 Bat Coordinator.



Tempe: October 20 - 23, 2021

The 50th Annual North American Symposium on Bat Research will be held in Tempe, Arizona, USA on 20-23 October 2021 at the Tempe Mission Palms Hotel and Conference Center. Given the current pandemic, we are working out details regarding how to safely bring our group together to celebrate our 50th meeting as a Society. Please stay tuned for updates on the NASBR webpage and please continue to participate in the Tempe Planning Surveys as the answers provided help the Local Hosts and Program Directors plan the event.



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Important Dates

June 1	Registration opens
Aug. 14	Early Registration Deadline & Abstracts due
Sep. 20	Last day to get conference rates at the hotel
Sep. 23	Program and Abstracts available online
Oct. 13	Last day to order t-shirts
Oct. 13	Last day to order banquet tickets

The Venue: Tempe Mission Palms Hotel and Conference Center

The 50th Annual Symposium on Bat Research will be held at the Tempe Mission Palms Hotel and Conference Center. This beautiful venue is located in the heart of eclectic Downtown Tempe, within easy walking distance of a wide variety of restaurants and attractions. Visitors will have countless options to enjoy the Valley of the Sun, whether they kayak on Tempe Town Lake, hike our backyard mountain "Hayden Butte," shop on famous Mill Avenue, or visit one of the Phoenix area attractions located within minutes of our centrally located hotel near Arizona State University's Tempe campus.



Tempe Mission Palms Hotel has 303 deluxe guest rooms, each with a work desk, flat-screen TV, in-room coffee maker, iron and ironing board, in-room hair dryer, in-room safe, refrigerator, and NEST Fragrances Scented Bath Products. Other amenities included in the nightly hospitality fee include: airport transportation (5:30 am to 10:30 pm), high-speed wireless internet, workout facility (6:00 am to 10:00 pm), and complimentary USA Today newspaper.

Room Rate: TBD.

Make a reservation: TBD

Parking: TBD

Want to Share a Room? Use the Roostmate Finder

Looking to share a room? Check out the Roostmate Finder - a website setup by the NASBR Student Reps to allow for attendees to find roommates and share a room. If you have a room and would like to split the cost, or if you are looking for a room to share, post it on the Roostmate site. This tool is available to all registrants, not just students.

Getting to the hotel: The Phoenix Sky Harbor International Airport (PHX) is located just 4 miles from the Mission Palms Hotel. Phoenix Sky Harbor International Airport, America's Friendliest Airport, is home to 20 airlines. Ranked as the best big airport in the U.S. by the Wallstreet Journal (11/2019), Phoenix Sky Harbor's great weather means on-time arrivals

Tempe Mission Palms Hotel offers transportation for individual travelers to and from Sky Harbor International Airport every

½ hour from 5:30am to 10:00pm daily.

Taxi, Uber, Lyft car services are readily available in Tempe. Depending on your arrival time, a ride from PHX to the hotel should cost around \$10.

Local Attractions



Photo from the Desert Botanical Garden

In the heart of the Valley of the Sun, Tempe is centrally located in the Metropolitan Phoenix area. Full of youthful energy and optimism, Tempe is a place where you can be yourself and enjoy the outdoors. We have an average temperature of 73 degrees, with more than 300 days of sunshine.

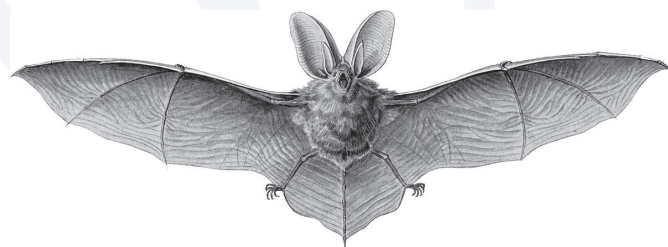
Below are some popular attractions in the Tempe area. Visit Tempe Tourism's Things to Do for additional information on locations, events, places to eat, and much more.

Announcements

Call for Photos

Photographs Needed for Bats of the West Indies

We are assembling a book entitled Bats of the West Indies: A Natural History and Field Guide that will include descriptive accounts and photographs of all 65 or so species that live in the region. The book will be published in 2022 by Comstock Publishing, a division of Cornell University Press, which is a non-profit organization. We are in particular need of photos of *Lasiurus degelidus* and *Eptesicus lymani*. If you have images



of either of these bats that you would like to contribute, please contact Armando Rodríguez-Durán (ARODRIGUEZ@bayamon.inter.edu). Thanks for your help.

*Armando Rodríguez-Durán, Interamerican University,
Bayamon, PR*

Allen Kurta, Eastern Michigan University, Ypsilanti, MI

Bat Yoga

CHIROPTERASANA: BAT YOGA WITH MIRANDA

SATURDAY, MARCH 20 ... 1-2:15PM EST VIA ZOOM

You're invited NASBR! Join me for a free restorative yoga class with gentle and creative poses inspired by our favorite flying mammals. Appropriate for all ages, body types and skill levels; no experience necessary. Please bring one blanket and two pillows to use as props.

Questions? Email miranda.dunbarj@gmail.com

Class link: <http://bit.ly/2OaMzA5>



 [c/o westhartfordyoga](https://www.facebook.com/cowesthartfordyoga) | westhartfordyoga.com | 860 953 9642 

Call for Updates from Regional Bat Working Groups

We would like to hear about the up to date information going on in our regional bat working groups. So if you are interested in sharing a brief (~300 words or less) blurb about great research, outreach, or anything fantastic happening in your working group, please contact the News Letter Lead.

Tempe 2021

Upcoming Conferences

19th International Bat Research Conference & 51st North American Symposium on Bat Research

August 7 - 12, 2022



Austin, TX

Local Host: Tigga Kingston, Texas Tech & Liam McGuire, University of Waterloo

Venue: Hilton Austin

<http://www.nasbr.org>

New England Bat Working Group Meeting

<http://www.nebwg.org/meetings.html>

Midwestern Bat Working Group Meeting

<http://mwbwg.org/>

Southeastern Bat Diversity Network Meeting

<http://sbdn.org/>

Western Bat Working Group Meeting

<http://wbwg.org/2019-biennial-workshop-and-meeting/>

15th European Bat Research Symposium

May 4-7, 2021

Turku, Finland

<http://ebrs2020.fi>

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Announcements

Scholarships / Grants

Bat Conservation International Scholarship

This scholarship of up to \$3,000 funds research aimed at bat conservation.

<http://www.batcon.org/our-work/initiatives/award-grants-scholarships>

Bat Conservation and Management

Small Grant Program

Up to \$5,000 in products and software to encourage important but under-supported conservation and/or research projects

<http://www.batmanagement.com/GrantProgram/grantprogram.html>

Holohil Grant Program

Scientific Product Grant

Offers Holohil transmitters at a reduced (or no) cost to research projects.

<http://www.holohil.com/grant-program>

Southeastern Bat Diversity Network Student Travel Award

Up to \$500 to attend NASBR

<http://www.wildlifeacoustics.com/grant>

Western Bat Working Group: Bob Berry Fund

This scholarship provides various technology to assist in research (transmitters, detectors, etc.).

<http://wbwg.org/>

Western Bat Working Group: Dixie Pierson Memorial Fund

This scholarship consists of two \$500 awards every other year to defray travel costs to the WBWG meeting.

<http://wbwg.org/>

Wildlife Acoustics

Scientific Product Grant

Up to \$5,000 in products (some exclusions apply) each quarter
Quarterly deadlines (Feb 15, May 15, Aug 15, Nov 15)

<http://www.wildlifeacoustics.com/grant>

American Society of Mammalogists Grants in Aid of Research

ASM provides various funding opportunities available to members.

<http://www.mammalsociety.org/grants>

AMNH Theodore Roosevelt Memorial Grants

Seed research grants are available for field-based research, as well as to use the AMNH collections.

<http://www.amnh.org/our-research/richard-gilder-graduate-school/academics-and-research/fellowship-and-grant-opportunities/research-grants-and-student-exchange-fellowships>

The Animal Behavior Society Research Grants

Several grants including Meeting Related Awards, Student Related Awards, Developing Nations Research Grants, Travel

Awards, and Career Awards.

<http://www.animalbehaviorsociety.org/web/awards.php>

The Society of Systematic Biology

Graduate Student Research Awards assist students in the initiation (first two years) of their systematics projects and in the collection of preliminary data.

<http://www.systbio.org/graduate-student-research-awards.html>

EPA Star and GRO Fellowships

Support for fellowships and professional development opportunities that will help ensure that environmental solutions are based on quality training and sound science.

Information here.

<https://www.epa.gov/research-fellowships>

Sigma Xi Grants in Aid of Research

Grants of up to \$1,000 to students from all areas of the sciences and engineering. Designated funds from the National Academy of Sciences allow for grants of up to \$2,500 for vision related research.

<https://www.sigmaksi.org/programs/grants-in-aid>

Back Issues of Bat Research News Available Online

Bat Research News (ISSN # 0005-6227) has published news, information, notes, and peer-reviewed articles since 1960 and, for many years, has printed the abstracts of presentations made at the annual meetings of NASBR. Although current subscribers are able to download the five, most-recent volumes from the journal's website as part of their subscription, many researchers find it difficult to locate copies of older material. Consequently, the Managing Editor, Margaret Griffiths, has made 17 years of back issues freely available to all on the journal's website (batresearchnews.org). These include volumes 40–56, covering the years 1999–2015. Older issues are available by directly contacting Margaret Griffiths (margaret.griffiths01@gmail.com).

~ Al Kurta

Invitation to Host The 53rd NASBR

2024 NASBR Meeting

The North American Society for Bat Research invites bids for hosting the 2024 annual meeting of the society. Intention to bid should be sent via email to the Program Directors, who will provide detailed advice on bid preparation. Final bids must be submitted by July 1, 2021 to the Chair of the NASBR Board of Directors (Dr. Burton Lim). Additional information can be found on the NASBR website under the 'Host a Meeting' tab. The NASBR Board of Directors will evaluate bids and successful bids meeting the basic criteria of the society will be placed before the members of the society at the NASBR business meeting for a vote of member preference.

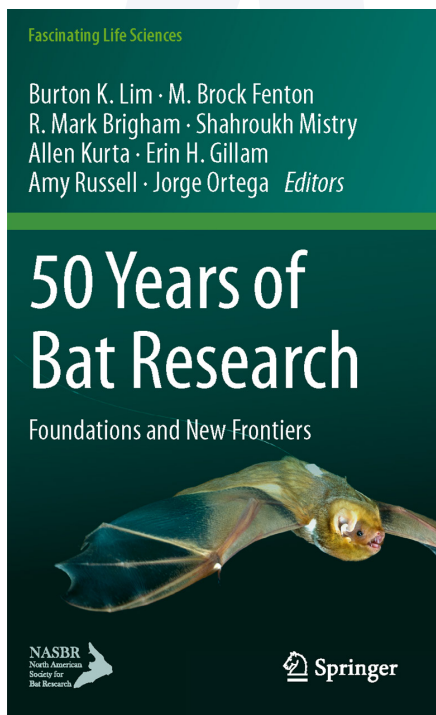
NASBR Financial Summary



Summary by calendar year:

	2011	2012	2013	2014	2015	2016	2017
General Fund	\$16,439.71	\$73,573.59	\$72,824.22	\$89,163	\$97,440	\$95,371	\$135,404
Spallanzani Fund	\$12,215.18	\$9,106.44	\$5,502.87	\$9,524	\$9,490	\$10,612	\$9,748
Teacher's workshop	\$5,574.25	\$5,618.89	\$5,660.18	\$6,389	\$6,636	\$5,374	\$4,083
Koopman Fund	\$12,006.64	\$12,682.07	\$12,182.08	\$12,238	\$12,431	\$12,676	\$12,176
Bernardo Villa Fund	\$11,307.73	\$9,086.57	\$7,994.97	\$6,820	\$5,717	\$6,249	\$5,259
TOTAL NASBR FUNDS (Dec 31)	\$57,543.51	\$110,067.46	\$98,661.45	\$124,134	\$131,714	\$130,282	\$166,670

Current balance (as of 10/23/2018) is \$203,744 (funds for paying for the 2018 meeting transferred in, partly expended).



50 Years of Bat Research: Foundations and New Frontiers

Available Now!

\$60 US for NASBR regular members with Coupon Code

NASBR60

\$40 US for NASBR student members with Coupon Code

NASBR40

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