The Society for Integrative and Comparative Biology

with the American Microscopical Society
The Crustacean Society

SICB 2020

FINAL PROGRAM

January 3-7, 2020
JW Marriott Austin • Austin, TX

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The Society for Integrative and Comparative Biology

FINAL PROGRAM

JW Marriott Austin

110 East 2nd Street

Austin, TX 78701

Future Meeting Dates

3-7 January 2021
Washington, District of Columbia

3-7 January 2022
Phoenix, Arizona

3-7 January 2023
Austin, Texas

The Society for Integrative and Comparative Biology

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Table of Contents




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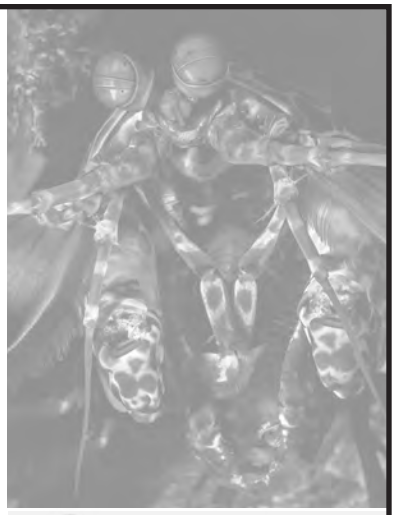
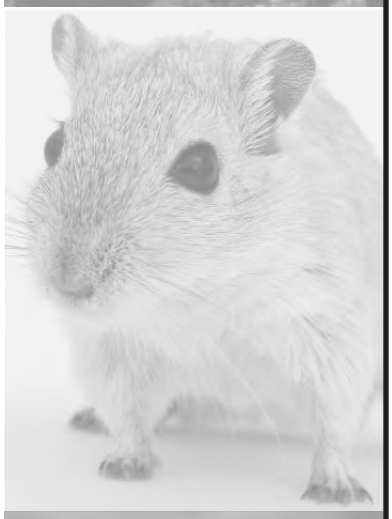

Welcome to Austin
Message from the President

Buckle up and hang on, we're in for another action-packed SICB meeting! Such a bounty of great science will keep us all hopping from room to room and still feeling conflicted about talks we have to miss. But that's a testament to all the superb research our SICB members bring to the Annual Meeting. Thanks to all platform and poster presenters; your work is the beating heart of this meeting.

In addition to all of the scientific highlights, the SICB leadership has been working hard behind the scenes to make our upcoming meeting as welcoming, safe, and inclusive as possible for all participants. We revised the *SICB Annual Meeting Code of Conduct* to include a better online system for reporting violations. As stated in the *Code*, SICB is committed to equal opportunity and treatment for all meeting participants, regardless of gender, gender identity or expression, race, color, national or ethnic origin, religion or religious belief, age, marital status, sexual orientation, disabilities, medical condition, genetic information, military or veteran status, or any other reason not related to scientific merit. Meeting participants are expected to uphold standards of scientific integrity and professional ethics. Harassment and other forms of misconduct undermine the integrity of SICB meetings and are strictly prohibited.

This year in Austin we have a number of programs and events in support of our LGBTQ+ attendees and expect these initiatives to continue in future years. As I noted this past fall in an email message to the whole Society, the state of Texas has laws that discriminate against LGBTQ+ people, and such laws are inconsistent with the values, aspirations and mission of SICB to advance the inclusion of all talent to maximize the excellence and integrity of our field. In contrast to the state's negative efforts, the city of Austin has taken positive steps to support the LGBTQ+ community, including a city ordinance against employment and housing discrimination based on sexual orientation and gender identity. With thanks to Outgroup, other LGBTQ+ volunteers, and the SICB Broadening Participation and Public Affairs Committees, we have the following initiatives supporting and celebrating our LGBTQ+ participants in Austin:

- Pronouns on badges: look for them in the lower left quadrant
- Outgroup-In: a sober social networking event and discussion of LGBTQ+ issues
- Outgroup Social: happy hour social event offsite for LGBTQ+ attendees and allies
- Out to Lunch: LGBTQ+ Mentor-Mentee lunches
- Outgroup badge stickers: Available for LGBTQ+ attendees and allies to show safe space and support
- Public Affairs Committee Workshop: Embracing Variation Among Humans: Perspectives on LGBTQ+ Experiences in Biology and Academia

Also, be sure to drop by the exhibits of our vendors; these exhibits provide useful information and they support our Society. I am particularly pleased to acknowledge **Sable Systems International** as a platinum sponsor. Sable Systems has been an important presence at our meetings for many years; please drop by their booth to see their wonderful products and to thank them for their support. I am also pleased to have **Wiley Publishers** as a gold sponsor. Wiley has also been an important fixture at SICB and they generously sponsor our Best Student Presentation Awards. **Xcitex**, **Arbor Assays** and **Friday Harbor Labs** return to SICB as silver sponsors and well as **BioOne Complete** as a bronze sponsor. Be sure to visit all the exhibits and support the exhibitors in any way you can; but please thank them for their support!

Finally, the SICB journals, *Integrative and Comparative Biology* and *Integrative Organismal Biology*, stand alongside our Annual Meetings as the core activities of SICB. Under the exciting leadership of Editor Ulrike Müller, *Integrative and Comparative Biology* is leading the way in implementing inclusive practices for scientific publishing, and *ICB* continues to publish synthetic and influential papers from our symposia and abstracts for the annual meeting. This year marks the first anniversary SICB's new open-access journal, *Integrative Organismal Biology*. Editor Adam Summers, the *IOB* Editorial Board, and *IOB* Outreach Associates have done a superb job launching this new outlet for integrative biology research. *IOB* makes the most of being an open access journal by publicizing every paper through a dedicated blog post by an Outreach Associate and social media promotion. This outreach publicity for every paper is a great perk of publishing your work in *IOB*. Altmetric scores how much attention papers get, and most *IOB* papers are in the top 5% of all research outputs scored by Altmetric. The missions of our journals are nicely complementary, and support SICB's mission to promote the scientific excellence encompassed by our Society.

I hope you enjoy the 2020 Annual Meeting of SICB!
Beth Brainerd

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Welcome to Austin
Message from the Program Officer

Welcome to the SICB Annual Meeting in Austin, Texas. We have 4 days of jam-packed science, with a total of over 980 contributed talks arranged into 140 oral sessions and 775 posters in 3 poster sessions. We also have 11 full-day symposia and a number of special lectures and workshops. The schedule is packed with interesting science and other SICB-sponsored activities but try to find some down time to see a bit of the city if you can. The entire schedule grid is on our website at www.burkclients.com/sicb/meetings/2020/site/program.html. Use this for a quick guide to where and when everything occurs. If you are attached to your cell phone, our mobile meeting app will keep you organized.

Major lectures: We are excited to open the annual meeting on Friday, January 3rd at 7:30 with our Plenary Lecture presented by Sheila Patek. Her lecture will focus on the importance and impact of interdisciplinary fundamental scientific discovery. Successive evenings will hold the Bartholomew Lecture by Mary Caswell Stoddard (Saturday, January 4, 7:00 PM); the Bern Lecture by George Bentley and the AMS Lecture by Sara Lindsay (both Sunday, January 5, 7:00 PM). We will conclude the meeting with the Moore Lecture by Emily Graslie (Tuesday, January 7, 3:45 PM). This is an all-star lineup so please be sure to budget some time in for these lectures!

Symposia: Eleven symposia were selected by the Program Committee and represent the diversity of the 12 divisions of SICB. These symposia represent cutting-edge research and syntheses all with an eye toward establishing the future of specific research areas. This year, we have three symposia that were selected for the special SICB-wide designation because they should appeal broadly across all our divisions. All of the symposia are the result of the hard work, creativity and enthusiasm of volunteer organizers without whom we would not have our journal, *Integrative and Comparative Biology*. This is because papers from the symposia talks are the basis of this journal. More information on our symposia can be found at: sicb.org/meetings/2020/symposia/index.php.

Workshops: Our SICB committees have been hard at work planning workshops to appeal to different segments of our membership on topics ranging from professional development to teaching strategies. It is important to note that this year, the Broadening Participation Committee and the Public Affairs Committee are both tackling the important theme of inclusion in science. Be sure to look out for their workshops. Every year we keep adding on additional workshops, on top of our regular committee workshops, thanks to the generosity of our members who want to share their expertise and time with meeting attendees. This year we have 10 (!) additional workshops in addition to our standard SICB committee workshops. Information on all of the workshops can be found here: burkclients.com/sicb/meetings/2020/site/workshops.html.

Socials: Part of our programming includes many organized social events for catching up with friends and colleagues or meeting new people. The first social is the Outgroup-In meeting and social starting at 5:30 followed by the Broadening Participation Meet and Greet at 6:30 on January 3. After the Plenary Lecture on January 3, we have the society-wide welcome reception from 8:30-10:00 PM. Division Socials are on Jan 4-6 and the meeting ends with the society-wide party in honor of students and post-docs on January 7 from 5:00-7:00 PM.

Business meetings: Business meetings are a great opportunity to hear about the activities of your division and the society. It is also a great way to see how you can become an active member of the society. The Society Executive Officers will swing by each business meeting to give an update on major society initiatives. We keep them short and sweet so that you attendees can grab dinner or attend an evening event.

Finally, the annual meeting is the result of the hard work of many folks. Please thank the division program officers, the TCS and AMS program reps, the symposium organizers, the SICB Executive Officers, committee chairs, and our great team from Burk & Associates: Brett Burk, Lori Strong, Jennifer Rosenberg, Raelene Sok, Jill Drupa, and Ruedi Birenheide. We hope that you will enjoy the meeting, find inspiration in the presentations, and establish new friendships and collaborations!

Susan Williams

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Co-Sponsoring Societies

American Microscopical Society (AMS)

The Crustacean Society (TCS)

The co-sponsoring society presentations are integrated into the program to minimize the potential conflicts of similar presentations being scheduled at the same time.

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Meeting Highlights/Social Events

Events take place in the JW Marriott Austin, unless otherwise noted

Friday 3 January

Student Worker Orientation & First Timer Orientation
Lonestar Ballroom, 5:30 PM – 6:30 PM
"How to get the most out of your SICB Meeting"
Required for students with Charlotte Mangum support

Plenary Session: Dr. Sheila Patek
Lone Star Ballroom, 7:30 PM – 8:30PM
The Plenary Address, "Impact and discovery: extreme movement in an interdisciplinary and political world", will be given by Dr. Sheila Patek.

Welcome to Austin Reception
Griffin Hall, 8:30 PM – 10:00 PM
The Society for Integrative and Comparative Biology welcomes you to Austin with a reception. The Welcome Reception will follow the Plenary Lecture. Light snacks and cash bar will be provided.

Saturday 4 January

Morning Run
JW Marriott Lobby, 6:00 AM

Poster Session 1
Grand Ballroom, 3:30 PM – 5:30 PM
Even # poster authors present from 3:30 pm-4:30 pm
Odd # poster authors present from 4:30 pm-5:30 pm

DCPB Social & BART Reception
Griffin Hall, 8:00 PM – 10:00 PM

Morning Runs

Do you like to run in the morning?

Join other SICB attendees for morning runs along Lake Travis. Runs will take place on the 4th, 5th, 6th and 7th. Meet in the Lobby of the JW Marriott at 6:00 am to get you back in plenty of time for the 8 am start time for sessions. A great way to start the day and meet other SICB attendees. Michele 'Nish' Nishiguchi will be leading the runs.

Sunday 5 January

Morning Run
JW Marriott Lobby, 6:00 AM

Poster Session 2
Grand Ballroom, 3:30 PM – 5:30 PM
Even # poster authors present from 3:30 pm-4:30 pm
Odd # poster authors present from 4:30 pm-5:30 pm

Monday 6 January

Morning Run
JW Marriott Lobby, 6:00 AM

Poster Session 3
Grand Ballroom, 3:30 PM – 5:30 PM
Even # poster authors present from 3:30 pm-4:30 pm
Odd # poster authors present from 4:30 pm-5:30 pm

SICB Business Meeting
Lone Star D, 5:30 PM – 6:30 PM
SICB Society Meeting & Awards Presentation

TCS/DEDB/DPCB/AMS/DIZ/DEE/DOB Social
Griffin Hall, 6:30 PM – 8:30 PM

DVM/DCB Social
South-East Lobbies, 9:00 PM – 12:00 AM

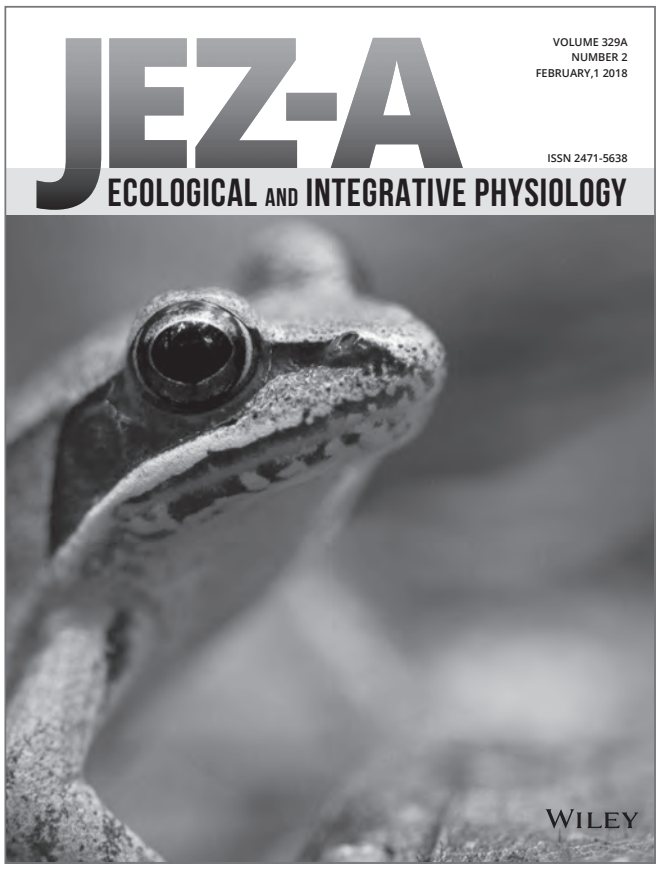
Broadening Participation Social
Room 401, 7:00 PM – 9:00 PM –

Tuesday 7 January

Morning Run
JW Marriott Lobby, 6:00 AM

Society-Wide Social in Honor of Students and Post-docs
Griffin Hall, 5:00 PM – 7:00 PM
Join fellow SICB members for a Society-Wide Social. Cheese and fruit will be served, and a cash bar will be provided.

Submit your Research and Enjoy these Author Benefits!



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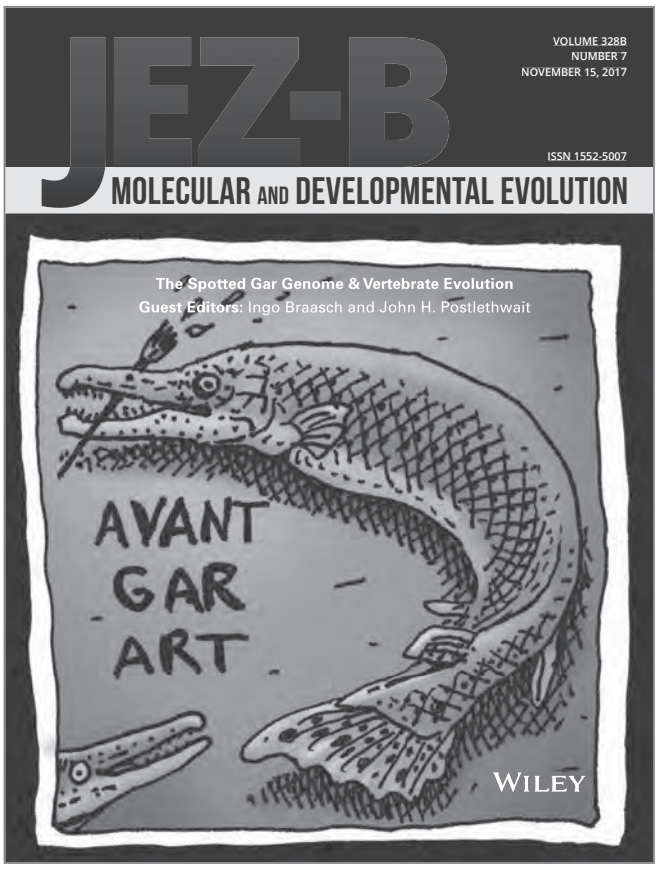

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SICB and Divisional Business Meetings

Saturday 4 January

DAB Meeting, 5:45 PM – 6:30 PM, Lone Star E
DNNSB Meeting, 5:45 PM – 6:30 PM, Lone Star F
DCPB Meeting, 5:45 PM – 6:30 PM, Lone Star G
DVM Meeting, 5:45 PM – 6:30 PM, Rooms 303-304
DEE Meeting, 5:45 PM – 6:30 PM, Room 205
DEDE Meeting, 5:45 PM – 6:30 PM, Rooms 201-202
DEDB Meeting, 5:45 PM – 6:30 PM, Lone Star H

Sunday 5 January

TCS Business Meeting, 12:00 PM – 1:30 PM, Room 309
AMS Business Meeting, 12:00 PM – 1:30 PM, Room 408
DCE Meeting, 5:45 PM – 6:30 PM, Lone Star A
DCB Meeting, 5:45 PM – 6:30 PM, Lone Star B
DIZ Meeting, 5:45 PM – 6:30 PM, Lone Star C
DPCB Meeting, 5:45 PM – 6:30 PM, Rooms 301-302
DOB Meeting, 5:45 PM – 6:30 PM, Room 205

SICB Society Business Meeting & Awards Presentation
Monday 6 January, 5:30 PM – 6:30 PM, Lone Star D

Special Lectures

Plenary Session: Dr. Sheila Patek
Friday 3 January, 7:30 PM – 8:30 PM, Lone Star Ballroom
Impact and discovery: extreme movement in an interdisciplinary and political world

Bartholomew Lecture: Dr. Mary Caswell Stoddard
Sponsored by Sable Systems
Saturday 4 January, 7:00 PM – 8:00 PM, Salons D-E
Diversity of Form and Function in the Colorful World of Birds

AMS Lecture: Dr. Sara Lindsay
Sunday 5 January, 7:00 PM – 8:00 PM, Rooms 301-302
The Art of Seeing: Using Microscopy to Power STEAM Learning in Biology

Bern Lecture: Dr. George Bentley
Sunday 5 January, 7:00 PM – 8:00 PM, Salons D-E
A Bird's Eye View of Reproductive Endocrinology

Moore Lecture: Emily Graslie
Tuesday 7 January, 3:45 PM – 4:45 PM, Salon 5
Prehistoric Road Trip: Crafting a Story 2 Billion Years in the Making

The Exhibits will open on Saturday 4 January at 9:30 AM. JW Marriott Austin, Grand Ballroom, will be the location for coffee breaks Saturday through Tuesday mornings from 9:30 AM – 10:30 AM, and 3:30 PM – 4:30 PM Saturday through Monday during the poster sessions.

Symposia

Saturday 4 January

S1: New Frontiers in Antarctic Marine Biology
Organizers: James McClintock, Charles Amsler, Bill Baker, Art Woods, Amy Moran
Sponsors: DCPB, DEE, DIZ, AMS, TCS

S2: Epigenetic Variation in Endocrine Systems
Organizers: Tyler Stevenson, Lynn Martin, Haley Hanson
Sponsors: DAB, DCE, DCPB, DEDB, DEDE, DNNSB

S3: Biology at the Cusp: Teeth as a Model Phenotype for Integrating Developmental Genomics, Biomechanics, and Ecology
Organizers: Gareth Fraser, Darrin Hulsey
Sponsors: DCB, DEDB, DEE, DVM

Sunday 5 January

S4: Reproduction: the Female Perspective from an Integrative and Comparative Framework
Organizers: Virginia Hayssen, Teri Orr
Sponsors: DAB, DCE, DCPB, DEDB, DEE, DEDE, DNNSB, DPCB, DVM, AMS

S5: Form, structure and function: How plants vs. animals solve physical problems
Organizers: Ulrike Müller, Simon Poppinga, Anna Westermeier
Sponsors: DCB, DIZ, DVM, AMS

S6: Bio-inspiration of silent flight of owls and other flying animals: recent advances and unanswered questions
Organizers: Christopher Clark, Justin Jaworski
Sponsors: DAB, DCB, DEE, DVM

Monday 6 January

S7: Building Bridges from Genome to Phenome: Molecules, Methods and Models
Organizers: Karen Burnett, Jonathon Stillman, Donald Mykles, David Durica
Sponsors: DCE, DCPB, DEDB, DEDE, DEE, DIZ, DPCB, AMS, TCS

S8: Long Limbless Locomotors: The Mechanics and Biology of Elongate, Limbless Vertebrate Locomotion
Organizer: Henry Astley
Sponsors: DAB, DCB, DNNSB, DVM

S9: Applied Functional Biology: Linking Ecological Morphology to Conservation and Management
Organizers: Lance McBrayer, Eric McElroy, Diego Sustaita
Sponsors: DAB, DCB, DEE, DNNSB, DVM

Tuesday 7 January

S10: Melding Modeling and Morphology: integrating approaches to understand the evolution of form and function
Organizers: Lindsay Waldrop, Jonathan Rader
Sponsors: DCB, DEDB, DPCB, DVM, TCS

S11: Integrative comparative cognition: can neurobiology and neurogenomics inform comparative analyses of cognitive phenotype?
Organizers: Yuxiang Liu, Sabrina Burmeister
Sponsors: DAB, DEDE, DEE, DNNSB, DPCB

Workshops and Programs

Friday 3 January

Workshop: Spatiotemporal Dynamics of Communication

9:00 AM – 2:00 PM, Rooms 301-302

This workshop will integrate approaches from neuroscience, cognitive ecology, biomechanics, spatial ecology, machine vision, evolution, and animal behavior to address the spatiotemporal dynamics of complex signaling. Our hope is that participants will leave the workshop better able to apply approaches and knowledge from the other disciplines to generate new experimental designs and analytic tools. We plan to intersperse short presentations, much discussion, and mingling to promote new collaborations.

Workshop In Honor of Stan Rachootin

1:00 PM – 6:00 PM, Rooms 303-304

This workshop honors Professor Stan Rachootin on the occasion of his retirement from Mount Holyoke College. Dr. Rachootin joined the faculty at Mount Holyoke in 1984, and over decades has taught classes on Darwin's works, Ecology and Evolution, Macroevolution, and Invertebrate Zoology, among many others. Dr. Rachootin has had long-term impact on evolutionary and developmental biology through his mentoring of many female scientists. The senior theses of Dr. Rachootin's students were strikingly diverse - the systems ranged from guppies to oligochaetes to mice, and the questions ranged from the evolution of behavior, to the origin of novel structural patterns on insect wings, to studies in the history of science. This workshop will feature talks by many of his students who are continuing to have impact on scientific research in their varied careers be they in academia, industry, or science communication.

Student Worker Orientation & First Timer Orientation*, "How to get the most out of your SICB meeting"

5:30 PM – 6:30 PM, Lonestar Ballroom

**Required for students with Charlotte Mangum support*

Saturday 4 January

Student Postdoctoral Affairs Committee: "How-To?" Daily Booth

9:15 AM – 5:00 PM, Grand Ballroom

Public Affairs Committee Workshop: Embracing Variation Among Humans: Perspectives on LGBTQ+ Experiences in Biology and Academia

12:00 PM – 1:30 PM, Rooms 303-304

This workshop is a collaboration between the Public Affairs Committee and the National Organization of Gay and Lesbian Scientists and Technical Professionals (NOGLSTP). NOGLSTP is a national organization with decades of experience empowering "lesbian, gay, bisexual, transgender, and queer individuals in science, technology, engineering, and mathematics by providing education, advocacy, professional development, networking, and peer support." During this workshop we will openly discuss the perspectives of the LGBTQ+ community within our society, the field of organismal biology, and academia more broadly. A NOGLSTP representative will first lead an eye-opening information session about challenges facing this community at all career levels. This will be followed by a question-and-answer period where audience members can ask SICB members from the LGBTQ+ community about their experiences. We aim to represent the diversity of SICB in sexual orientation, gender identity and expression, career stage, and scientific interests on this panel. The PAC welcomes participations from across our membership at this workshop. No registration is required.

Workshop: Mentorship and Sponsorship: How to Curate Your Support Team and Guide Your Successful Career
12:00 PM – 1:30 PM, Rooms 301-302

What do you expect out of your relationships with mentors? Do you know the difference between a sponsor and a mentor? This workshop will be a discussion to learn what to give and gain from your mentors and sponsors to support your own career goals. You will also learn how to map your mentor and sponsor relationships and build your support team -based around your career goals. This workshop is geared for late-stage graduate students, post-docs, and early career researchers.

DPCB Ask-An-Expert: Get Phylogenetic and Comparative Methods Support with an Expert
3:30 PM – 5:30 PM, Grand Ballroom

Initiated at our 2019 meeting in Tampa, our DCPB experts are back at SICB 2020 to help your with phylogenetic methods. Bring your questions and datasets and they will be there during each poster session to help!

Broadening Participation Movie and Workshop: "Can We Talk? Difficult Conversations with Underrepresented People of Color: Sense of Belonging and Obstacles to STEM Fields" with Professor Kendall Moore
7:00 PM – 9:00 PM, Rooms 301-302

The Broadening Participation Committee will have a screening of "Can We Talk? Difficult Conversations with Underrepresented People of Color: Sense of Belonging and Obstacles to STEM Fields" by award-winning documentary film-maker Kendall Moore, followed by a discussion of the work with the filmmaker. Dr. Moore is a Professor of Journalism & Film/Media at the University of Rhode Island. Dr. Moore has produced numerous documentaries that have aired on PBS and in film festivals. She is the recipient of 2 Fulbright Scholar Awards and the Rhode Island Film Fellowship for Outstanding Filmmaking.

Sunday 5 January

Student Postdoctoral Affairs Committee: "How-To?" Daily Booth
9:15 AM – 5:00 PM, Grand Ballroom

Workshop: An Introduction to the World of Book Publishing from Editors and Authors
12:00 PM – 1:30 PM, Room 408

Join several authors and book publishers for this introduction to the world of book publishing. Panelists will include Alison Kalett of Princeton University Press, Ian Sherman of Oxford University Press, Cameron Ludwick of University of Texas Press, Prof. David Hu, author of *How to Walk on Water and Climb Up Walls*, and Prof. Mike Ryan, author of *A Taste for the Beautiful*. Publishers will explain the pitching, proposal, review, publication and promotion process. And David and Mike will explain book writing and publishing from an author's perspective. There will be plenty of time for audience questions and a light lunch will be available on a first come first serve basis.

Symposium 5 Workshop: How to Disseminate Your Research
12:00 PM – 1:30 PM, Room 404

The goal of this workshop is to support conference presenters in their ability to disseminate their research to a general public through the press and social media. Participants will be able to interact with experts in science communication and science outreach to develop press releases, social media posts, and other formats to communicate their research to the general public.

Workshops and Programs

Continued

Organizing Meeting for Building Bridges Symposium
12:00 PM – 1:30 PM, Room 407

Workshop: Panel on Research and Working at Primarily Undergraduate Institutions
12:00 PM – 1:30 PM, Room 402-403

The workshop will consist of a panel of faculty members, all of whom are currently at a Primarily Undergraduate Institution (PUI). We will discuss how research at PUIs is conducted, what opportunities are available, applying for those opportunities, and what the challenges are for faculty at PUIs. The moderator of the panel will be Adam Summers, a senior faculty member at the University of Washington and PUI alumnus (Swarthmore College). There will be a brief question and answer session for the panel members, before broadening the workshop to the entire group. We will have breakout stations where small groups of participants can interact individually with one of the panelists, to discuss different aspects of being at a PUI: teaching, research, service, and expectations. Breakout stations will rotate so that each group will have an opportunity to discuss each facet of a PUI.

DPCB Ask-An-Expert: Get Phylogenetic and Comparative Methods Support with an Expert
3:30 PM – 5:30 PM, Grand Ballroom

Initiated at our 2019 meeting in Tampa, our DCPB experts are back at SICB 2020 to help your with phylogenetic methods. Bring your questions and datasets and they will be there during each poster session to help!

TAL-X Workshop: Teaching Critical Thinking About Science and Technology: GMOs As a Case Study
7:00 PM – 9:00 PM, Rooms 303-304

The 2020 Teaching and Learning Workshop is titled: “Teaching critical thinking about science and technology: GMOs as a case study.” It will be a two-hour round table format with drinks and desserts, from 7-9pm on Sunday, January 5th in room 401.

The workshop is being organized by Bram Lutton, Ph.D., Chair of the Educational Council, who has taught ethics in science and technology for the past ten years at Endicott college and the Mount Desert Island Biological Laboratory. Dr. Lutton’s co-leader will be Steven Druker, J.D., Executive Director of the Alliance for Bio-Integrity; recipient of a Luxembourg Peace Prize for outstanding work to foster environmental health; a member of the food safety panels at conferences on GMOs held by the FDA and the National Research Council; and the author of Altered Genes, Twisted Truth, which Jane Goodall's foreword hails as "without doubt one of the most important books of the last 50 years."

The workshop will provide an excellent opportunity for SICB members interested in science education and/or bioethics to experience the application of critical thinking methods to one of the most important and controversial scientific/technological topics.

Monday 6 January

Student Postdoctoral Affairs Committee: "How-To?" Daily Booth
9:15 AM – 5:00 PM, Grand Ballroom

NSF Program Officers: Funding Opportunities, Integrative Research and Education, and Q&A
12:00 PM – 1:30 PM, Lone Star C

Round-table discussion: Overcoming Challenges for Testing Gene Function in Post-Embryonic Life Stages
12:00 PM – 1:30 PM, Rooms 211-212
Testing gene function is key for illuminating the genome to phenome connection. Post-embryonic processes (e.g., regeneration, larval patterning, growth, homeostasis, metamorphosis) are central to the biology of many animals, but manipulating gene function during these processes can be particularly challenging. This round-table discussion will focus on challenges and approaches for testing gene function specifically in post-embryonic life stages of animals. Light food will be served.

Student Support Committee Brown Bag Workshop for Graduate Students: Writing a competitive GIAR/ FGST grant proposal
12:00 PM – 1:30 PM, Room 404
Specific information and tips on writing competitive GIAR & FGST grant proposals will be provided by the Chair of the Student Support Committee followed by an informal Q&A session. Previous award winners are also invited to provide their experiences and insights on the process of applying for these awards.

Workshop: Parenting Through Academia
12:00 PM – 1:30 PM, Rooms 402-403
A growing body of societal research across STEM disciplines has shown that academics experience different professional expectations, salaries, and resource availability as a result of their gender and parenting status. Leaky pipeline notwithstanding, female professionals with children are often thought to be less productive by employers and management (1), despite recent published findings showing higher productivity and greater efficiency from those with children (2); yet a historical bias that it is not possible to be both productive in science and have a family has caused many persons to choose against having children. Parenting can be challenging regardless of professional circumstances, but given the possibility to identify resources, enable opportunities, and create flexibility, academia may in fact be one of the best possible situations in which to be a career-oriented parent. The purpose of this workshop is to present a forum for conversation regarding a diverse range of parenting and professional experiences, with the goal of making useful strategies and lesser-known resources more widely available, in addition to building a community of persons for support and mentorship.

Podcast: Live Recording of Big Biology with Dr. Molly Cummings
3:30 PM – 4:30 PM, Room 407

DPCB Ask-An-Expert: Get Phylogenetic and Comparative Methods Support with an Expert
3:30 PM – 5:30 PM, Grand Ballroom
Initiated at our 2019 meeting in Tampa, our DCPB experts are back at SICB 2020 to help your with phylogenetic methods. Bring your questions and datasets and they will be there during each poster session to help!

Workshops and Programs

Continued

Tuesday 7 January

Student Postdoctoral Affairs Committee Workshop: Transitions in Science Careers

12:00 PM – 1:30 PM, Lone Star E

How should you approach making the transition from undergrad to Masters/PhD; or PhD to postdoc; or postdoc/fellow to faculty; or other careers? SPDAC is hosting a roundtable lunch event to facilitate (with expert "hosts") discussion and advice for all those interested.

Workshop: Building Bridges from Genome to Phenome: Molecules, Methods and Models

12:00 PM – 1:30 PM, Room 401

Workshop attendees will be asked to evaluate newly developed approaches and models presented or discussed in the Building Bridges sessions in the context of the grand challenge of linking genome to phenome. They will work to identify the leading edges as well as the key barriers to this research with respect, for example, to melding different types of datasets and working across levels of biological organization to inform our understanding of how phenotype variation arises. This synthesis will form the basis for the symposium policy white paper, which will be published in Integrative and Comparative Biology as part of the symposium volume.

Workshop: 3D Visualization and Morphometrics with SlicerMorph

12:00 PM – 3:30 PM, Rooms 502-503

SlicerMorph is an NSF funded project to extend the functionality of the 3D-Slicer with tools that will help biologists working with 3D specimen data. Toolkit enables biologists to retrieve, visualize, measure and annotate high-resolution specimen data both from volumetric scans (CTs and MRs) as well as from 3D surface scanners effectively within 3D-Slicer. Functionalities SlicerMorph offers are: landmark-based statistical shape analysis, 3D visualization of shape deformation, ability to generate movies and more. Free and open-source nature of the project help remove the road blocks to data sharing and collaboration that commercial software impede on research. We will also cover how to do segmentation and visualization in 3D-Slicer as part of the workshop.

General Information

Final Program

SICB does not assume responsibility for any inconsistencies or errors in the abstracts for contributed paper and poster presentations. We regret any possible omissions, changes and/or additions not reflected in this final program..

Speaker Ready Room

All presenters must visit the Ready Room, **Room 405, 4th Floor**, at least one half day prior to his/her session time. It is highly recommended that you preview your presentation prior to your presentation to guarantee that it will work properly. Each presentation will be loaded onto a master file for each session. You may use your own computer, however, your fifteen minute time slot does not include time for set up and testing. There will be students and audio visual personnel to assist you and to check you in during the following hours:

Friday 3 January	12:00 PM – 7:00 PM
Saturday 4 January	7:00 AM – 5:00 PM
Sunday 5 January	7:00 AM – 5:00 PM
Monday 6 January	7:00 AM – 5:00 PM
Tuesday 7 January	7:00 AM – 10:00 AM

Registration

The SICB Registration/Information area is located in the foyer of the Grand Ballroom. The Registration Desk will be open during the following hours:

Friday 3 January	3:00 PM – 7:30 PM
Saturday 4 January	7:00 AM – 5:00 PM
Sunday 5 January	7:30 AM – 3:30 PM
Monday 6 January	7:30 AM – 3:00 PM
Tuesday 7 January	7:30 AM – 2:30 PM

Pop Up Meeting?

Do you need a room for an unscheduled meeting, come to the registration desk and book your time.

Quiet Room

Feeling anxious and need a moment to decompress? A Quiet Room (Room 297) with low lighting is available for attendees to rest quietly and recharge before diving back into the fray.

Committee/Business Meetings

Please refer to the Schedule of Events on the first page of each day's listing for committee meetings and business meetings of your division or co-sponsoring society.

Employment Opportunities

The Employment Opportunity bulletin board will be located in the SICB Registration/Information area. The Employment Opportunity board will provide a place for attendees to post "Positions Wanted," and learn about "Positions Available." Interested attendees may schedule interviews in the room set aside for that purpose. See a registration desk attendant for assistance.

Coffee Breaks

Coffee break service is available each day of the meeting. There will be a morning service from 9:30 AM — 10:30 AM and an afternoon service from 3:30 PM — 4:30 PM. The coffee breaks will be located in the Grand Ballroom.

Keyword Index

Refer to the keyword index located at the end of this program for easy access when looking up a specific subject matter. Each author who is presenting an abstract has supplied up to three keywords for your reference.

SICB Childcare Room

This year, SICB is providing FREE onsite childcare through Preferred Sitters Childcare in Rooms 310-311. Pre-registration was required, but there may be space for drop-ins.

Mother's Room

SICB recognizes that balancing a family and meeting attendance creates unique challenges for parents. There is a Mother's room on the third floor in Room 305, located next-door to the childcare room and within quick access of talks. The Mother's room is a private room equipped with comfortable chairs for nursing, chairs and tables for pumping, outlets, a refrigerator for milk.

Getting Our Event App is a Snap!

Scan the QR code to access our event app for iPhone, iPad or Android today!

...Or

Use our direct link: **https://sicb2020.quickmobile.mobi** and jumpstart your event!

You can also download our event app from the App Store and Google Play!

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Search: SICB 2020

2020 SICB Exhibitor Floorplan

Grand Ballroom • JW Marriott Austin

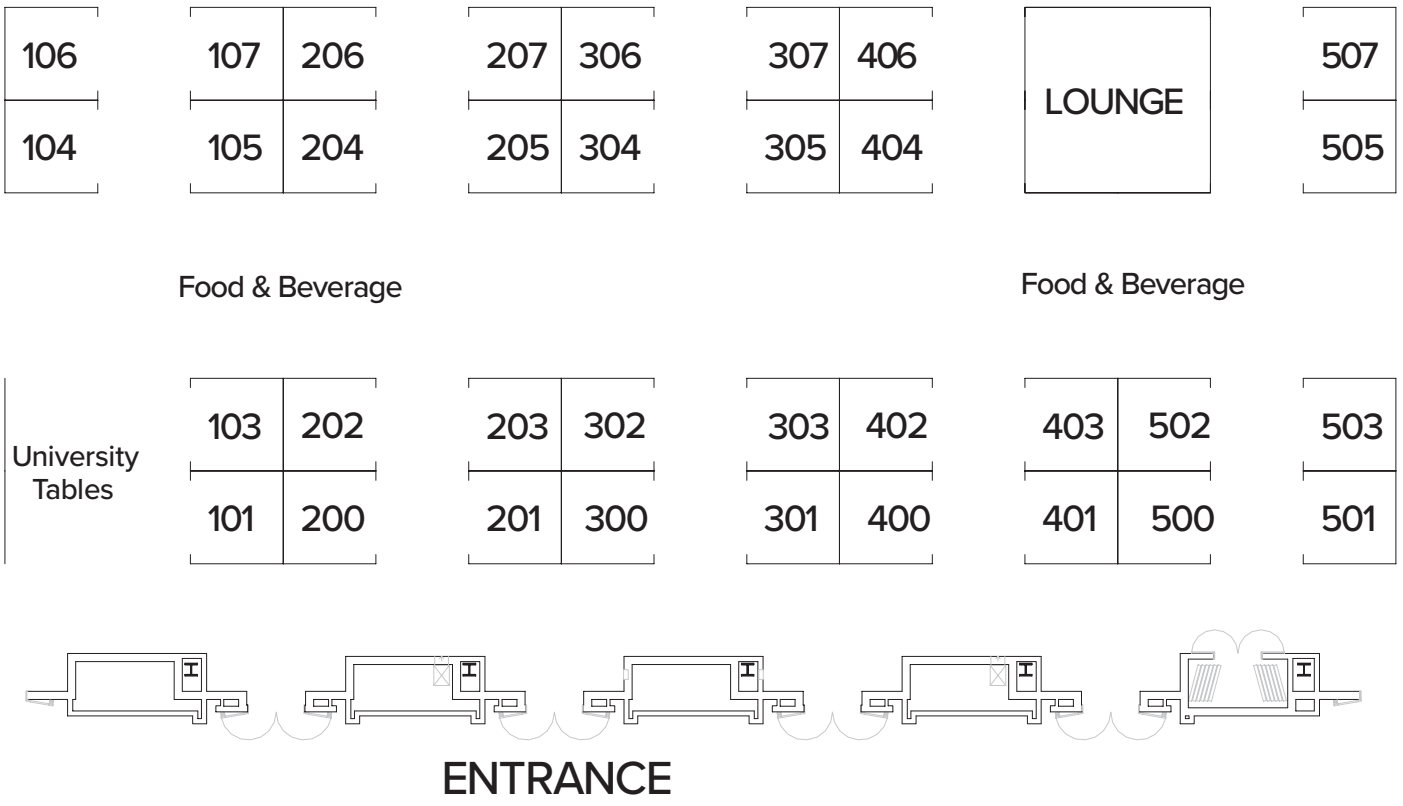

Exhibit Hours

Saturday 4 January
9:30 AM – 5:30 PM

Sunday 5 January
9:30 AM – 5:30 PM

Monday 6 January
9:30 AM – 5:30 PM

Coffee Breaks

Morning
9:30 AM – 10:30 AM

Evening
3:30 PM – 4:30 PM

Specialty Booths

SICB Journals, Booth 104

Find out more information about SICB's journals, *Integrative and Comparative Biology*, and our new journal, *Integrative Organismal Biology*

DPCB Ask-An-Expert, Booth 505

Get phylogenetic and comparative methods support with an expert

Student Postdoctoral Affairs Committee: "How-To?" Daily Booth

2020 SICB Exhibitors

AEI Technologies — Booth: 404

410 Technology Drive
Bastrop, TX 78602
800-860-5930
www.aeitechnologies.com

AEI Technologies manufactures single and multi-channel metabolic measurement systems providing everything you need to accurately measure energy metabolism by indirect calorimetry. Perfect for insects, amphibians, reptiles, birds, mammals, and humans. Proprietary software enables real-time data acquisition, which can be displayed tabular, graphical or exported to an excel spreadsheet.

American Microscopical Society — Booth: 402

141 E. College Ave.
Decatur, GA 30030
312-369-7395
www.amicros.org

The American Microscopical Society is an international society of biologists organized to encourage the use of microscopy. AMS publishes the journal Invertebrate Biology and co-sponsors the SICB Annual Meeting. The AMS booth features the annual Buchsbaum Photomicrography Contest and information on opportunities for student research fellowships.

Arbor Assays — Booth: 107

Silver Sponsor

1514 Eisenhower Place
Ann Arbor, MI 48108
734-677-1776
www.arborassays.com

Arbor Assays produces state of the art detection and immunoassay kits to quantitate markers for oxidative stress, reproduction, HPA stress, inflammation, cell signaling, metabolism, kidney function, and normalization. We develop, manufacture and QC all products in house, in Ann Arbor, allowing us to provide optimal customer service and technical support.

Biological Bulletin, The — Booth: 200

Marine Biological Laboratory, 7 MBL Street
Woods Hole, MA 02543
508-289-7149
www.journals.uchicago.edu/bbl

The Biological Bulletin is a peer-reviewed, international interdisciplinary journal that publishes outstanding experimental research on a wide range of organisms and biological topics, with a focus on marine systems. Published since 1897, it is one of America's oldest and most respected journals.

The Company of Biologists — Booth: 507

Bidder Building, Station Road
Histon, Cambridge CB24 9LF UK
44 (0)1223 632877
www.biologists.com

The Company of Biologists is a not for profit publishing organisation dedicated to supporting and inspiring the biological community through scientific journals, meetings and grants. The Company publishes five specialist peer-reviewed journals: Development, Journal of Cell Science, Journal of Experimental Biology, Disease Models & Mechanisms and Biology Open.

The Crustacean Society — Booth: 206

950 Herndon Parkway , Suite 450
Herndon, VA 20170
703-790-1745
www.crustaceansociety.org

The mission of the Crustacean Society is to advance the study of all aspects of the biology of the Crustacea by promoting the exchange and dissemination of information throughout the world.

Expert Digital Imaging — Booth: 302

193 Jefferson Ave, Suite 102
Salem, MA 01970
339-440-4423
www.expertdigitalimaging.com

Expert Digital Imaging is an independent distributor of high-speed and high-resolution camera equipment from various manufacturers, including the full NAC and Mega Speed camera lines. At EDI, we offer hand-held, affordable high-speed cameras, traditional high-speed cameras as well as long-recording high speed systems with associated image tracking software.

Fastec Imaging — Booth: 301

17150 Via Del Campo, Suite 301
San Diego, CA 92127
858-592-2342
www.fastecimaging.com

Fastec designs and manufactures high-speed cameras including the 5-MP portable TS5 and computer-operated IL5, popular for field and lab applications. The new HS Series, with approximately 4x the record speed and 20x the image transfer rate, will be released in January 2020.

IO Industries Inc. Booth: 303

15940 Robin's Hill Road
London, ON N5V 0A4 Canada
519-663-9570
www.ioindustries.com

IO Industries Inc., London, ON, Canada (est. 1991), designs and manufactures digital video cameras, digital video recorders and software for applications in aerospace, defense testing, medical, scientific, machine vision, broadcast and cinema.

LaVision Inc. Booth: 201

211 W. Michigan Ave., Suite 100
Ypsilanti, MI 48197
734-485-0913
www.lavision.com

LaVision provides integrated imaging systems to scientific, industrial and educational markets. LaVision has extensive experience in optical techniques such as 2-D, stereo, and tomographic particle image velocimetry, gaseous and liquid laser induced fluorescence, shadowgraphy for multi-phase flows, digital image correlation for deformation/strain, high-speed and ultra-high-speed imaging, and intensified camera systems.

Lehigh University Department of Biological Science Booth: 105

111 Research Drive
Bethlehem, PA 18015
610-758-6235
www.lehigh.edu/~inbios

Lehigh's Department of Biological Sciences provides a collaborative, interdisciplinary environment for pursuing a PH.D in Biology, less and 1.5 hours from New York and Philadelphia. Chose from over 20 faculty research labs, and four concentrations: Evolution and Behavior, Neuroscience, Cell and Molecular Biology, and Biochemistry. Visit https://www.lehigh.edu/~inbios/Grad/Grad_General.html for more information.

Loligo® Systems Booth: 403

Toldboden 3, 2nd floor
Viborg, 8800 Denmark
45 6166 6929
www.loligosystems.com

Loligo® Systems develops research equipment for aquatic biology. Our products allow scientists all over the world to excel in the fields of swimming performance, respirometry, blood physiology and behavior analysis in a diversity of marine and freshwater organisms. We offer customized solutions as well as free scientific advice and support.

Micro Photonics Booth: 400

1550 Pond Rd., Suite 110
Allentown, PA 18104
610-366-7103
www.microphotonics.com

Micro Photonics and partner Bruker MicroCT are leading the advancement in high resolution micro-CT solutions for comparative biology research. SkyScan Micro-CTs meet the 3D high-resolution and versatility required for any demanding research laboratory. Micro Photonics offers contract services and system sales for Bruker Micro-CTs.

National Science Foundation Booth: 501

2415 Eisenhower Avenue
Alexandria, VA 22314
703-292-8420
www.nsf.gov

The National Science Foundation, an independent federal agency created by Congress in 1950, supports non-medical basic research in all science and engineering fields with an annual budget of about $7 billion. NSF funds approximately 20% of all federally supported basic research conducted by US colleges and universities.

Oxford University Press Booth: 304

198 Madison Avenue
New York, NY 10016
800-445-9714
global.oup.com

Oxford University Press is proud to publish one of the most highly respected and cited journals in the field of biology, Integrative and Comparative Biology, and the 2019 new launch journal Integrative Organismal Biology, in partnership with The Society for Integrative and Comparative Biology.

Oxford University Press is a department of the University of Oxford. It furthers the University's objective of excellence in research, scholarship, and education by publishing worldwide. As a press, we take pride in this mission, which allows us to enable, support, and facilitate research and scholarship.

Princeton University Press Booth: 203

41 William Street
Princeton, 08540
609-258-4900
press.princeton.edu

Princeton University Press publishes distinguished titles in the biological sciences. New titles include *How to Walk on Water and Climb up Walls* by David Hu, *Computing Skills for Biologists* by Stefano Allesina and Madlen Wilmes, *The Lives of Bees* by Thomas Seeley, and *Ecological Mechanics* by Mark Denny. Purchase at our booth or order online at press.princeton.edu and enter coupon code BIO20 to receive 30% off. Offer expires February 15, 2020.

Qubit Systems Inc. Booth: 300

1573 John Counter Boulevard
Kingston, ON K7M 3L5 Canada
613-384-1977
www.qubitsystems.com

Accurate, affordable gas exchange systems for animal and insect respirometry. See our new CISME system for in situ aquatic respirometry. Analyzers for CO_2, O_2, H_20, CH_4 etc. Environmental monitoring and control. Wearable CPX systems and metabolic carts. Exceptional quality at sensible prices. We design and build custom equipment for specific applications.

Royal Society Publishing Booth: 204

6-9 Carlton House Terrace
London, SW1Y 5AG UK
44 207 451 2647
www.royalsociety.org/journals

Royal Society Publishing has several journals of interest to the SICB community, including Journal of the Royal Society Interface, Proceedings B and Biology Letters. We offer high quality peer review, rapid publication and open access options. Visit booth 204 to find out more about what we've been publishing in the field of integrative and comparative biology. Further information at http://royalsociety.org/journals

Sable Systems International, Inc. Booth: 205

Platinum Sponsor

3840 N Commerce Street
North Las Vegas, NV 89032
702-269-4445
www.sablesys.com

Sable Systems: world leader in precision metabolic and behavioral measurement, providing instrumentation and expertise that enable true scientific discovery and understanding. Our systems provide the most accurate, data-rich study results. And we assist you every step of the way, including experimental design, system configuration, setup, training, service and support. Proud Sponsor of the George A. Bartholomew Award.

The University of Chicago Press Booth: 202

1427 E 60th St
Chicago, IL 60637
800-621-2736
www.press.uchicago.edu

Established in 1891, the University of Chicago Press is the largest American university press. The Press publishes approximately 280 books a year and has published over 11,000 books since its founding. The Journals Division publishes more than 70 journals in a wide range of academic disciplines, including the social sciences, the humanities, education, and life and physical sciences.

UW Friday Harbor Laboratories Booth: 401

Silver Sponsor

620 University Rd
Friday Harbor, WA 98250
360-378-2165
fhl.uw.edu

The UW Friday Harbor Laboratories offers the ideal setting to study the marine world. Faculty and researchers from the University of Washington and around the world come to FHL to study oceanography, chemistry, biology, ecology and other marine disciplines. Students find opportunities to immerse themselves in research and coursework, connecting classroom learning to the rich ecosystems thriving throughout the San Juan Archipelago.

Xcitex Inc.

Booth: 305

Silver Sponsor

8 Cabot Road, Suite 1400
Woburn, MA 01801
617-225-0080
www.xcitex.com

Xcitex is the market leader in innovative end-to-end video systems that combine motion capture and analysis in an integrated solution to meet the specific needs of scientists and researchers. ProAnalyst® is professional grade motion analysis software with many specialized toolkits and a proven track record of over 1,500 users worldwide in various industries and educational institutions.

Zoological Lighting Institute

Booth: 406

85 Broad Street, 29th Floor
New York, NY 10004
212-317-2927
www.zoolighting.org

The Zoological Lighting Institute is a 501 (c)(3) dedicated to 'supporting the sciences of light and life through the arts for animal welfare and wildlife conservation'. ZLI provides grants to researchers and promotes the value of photobiological research to the public through a variety of mission related programming and campaigns.

University Tables

Clemson University Biological Sciences Department

132 Long Hall
Clemson, SC 29634
864-656-2328
www.clemson.edu/science/departments/biosci

Clemson University's Biological Sciences Department provides opportunism for integrative M.S. and Ph.D. projects in organismal biology. From Molecules to Ecosystems, our research spans the tree of life, with expertise in behavioral ecology, biomechanics, evo-devo, evolutional morphology, macroevolution, modeling, and physiology. We value diversity and offer strong TA support.

New Mexico State University Department of Biology

Box 30001, MSC 3AF
Las Cruces, NM 88003-8001
575-646-3613
rise.nmsu.edu

The NMSU RISE (Research Initiative for Scientific Enhancement) to the Postdoctorate Program aspires to augment the interest, skills, and competitiveness of graduate students in pursuit of biomedical and biobehavioral research careers. NMSU RISE Scholars are prepared for the next step of their career through, mentored research experiences in four NMSU colleges, scientific workshops that develop cutting edge quantitative and technical skills, guided expansion of their professional network, career planning, and training for the professoriate, biomedical research seminars, formal courses, research internships at STARTUP partner institutions, tuition, health care, and budget for research supplies and travel to present at scientific conferences.

University of Michigan – Department of Ecology and Evolutionary Biology

1105 North University Avenue
Ann Arbor, MI 48109
734-764-1443
lsa.umich.edu/eeb

The University of Michigan Department of Ecology and Evolutionary Biology is recruiting at several career stages. We have a fully funded Frontiers Masters program, a NextProf workshop to equip students with the skills to land their dream job in academia, and several postdoctoral fellowships, many of which bridge into professorships.

Texas A&M University Gulf Center for Sea Turtle Research

200 Seawolf Parkway
Department of Marine Biology
Galveston, TX 77553
409-740-4884
www.tamug.edu/GulfCenterforSeaTurtleResearch

The Gulf Center for Sea Turtle Research was created to address the research needs to conserve sea turtles throughout the Gulf of Mexico. The Center seeks to organize sea turtle biologists in the region, to speak with one voice to attract attention, and funding, for sea turtle research and conservation.

Friday Schedule of Events

Events take place in the JW Marriott Austin, unless otherwise noted

EVENT	TIME	LOCATION
Speaker Ready Room	12:00 PM – 7:00 PM	Room 405
Exhibitor Set-Up	1:00 PM – 6:00 PM	Grand Ballroom
Registration	3:00 PM – 7:30 PM	Grand Ballroom Foyer
SPECIAL LECTURE		
Plenary Session: Dr. Sheila Patek: Impact & Discovery: Extreme Movement in an Interdisciplinary and Political World	7:30 PM – 8:30 PM	Lone Star Ballroom
COMMITTEE AND BOARD MEETINGS		
SICB Executive Committee Meeting	2:30 PM – 5:30 PM	Brazos
Student Worker Orientation & First Timer Orientation* "How to get the most out of your SICB meeting" **Required for students with Charlotte Mangum support*	5:30 PM – 6:30 PM	Lonestar Ballroom
Student Support Committee	5:30 PM – 7:00 PM	Room 301
WORKSHOPS AND PROGRAMS		
Workshop: Spatiotemporal Dynamics of Communication	9:00 AM – 2:00 PM	Rooms 301-302
Workshop In Honor of Stan Rachootin	1:00 PM – 6:00 PM	Rooms 303-304
SOCIAL EVENT		
Outgroup-In Sober Social and Meeting	5:30 PM – 6:30 PM	Rooms 201-202
Broadening Participation Meet & Greet	6:30 PM – 7:30 PM	Room 401
SICB Welcome Reception	8:30 PM – 10:00 PM	Griffin Hall

Saturday Schedule of Events

Events take place in the JW Marriott Austin, unless otherwise noted

EVENT	TIME	LOCATION
Registration	7:00 AM – 5:00 PM	Grand Ballroom Foyer
Speaker Ready Room	7:00 AM – 5:00 PM	Room 405
Poster Session 1 Set Up	7:00 AM – 8:00 AM	Grand Ballroom
Coffee Break AM	9:30 AM – 10:30 AM	Grand Ballroom
Exhibit Hall	9:30 AM – 5:30 PM	Grand Ballroom
Coffee Break PM	3:30 PM – 4:30 PM	Grand Ballroom
Poster Session 1 Even Numbers Authors Present	3:30 PM – 4:30 PM	Grand Ballroom
Poster Session 1 Odd Numbers Authors Present	4:30 PM – 5:30 PM	Grand Ballroom
Poster Session 1 Teardown	5:30 PM – 6:00 PM	Grand Ballroom

SPECIAL LECTURE

Bartholomew Lecture: Dr. Mary Caswell Stoddard Diversity of Form and Function in the Colorful World of Birds	7:00 PM – 8:00 PM	Salons D-E

SYMPOSIUM ORAL PRESENTATIONS

S1: New Frontiers in Antarctic Marine Biology Chairs: James McClintock, Charles Amsler, Bill Baker, Art Woods, Amy Moran	7:45 AM – 3:30 PM	Rooms 203-204
S2: Epigenetic Variation in Endocrine Systems Chairs: Tyler Stevenson, Lynn Martin, Haley Hanson	7:45 AM – 3:30 PM	Brazos
S3: Biology at the Cusp: Teeth as a Model Phenotype for Integrating Developmental Genomics, Biomechanics, and Ecology Chairs: Gareth Fraser, Darrin Hulsey	8:00 AM – 3:30 PM	Lone Star D

CONTRIBUTED PAPER ORAL PRESENTATIONS

MORNING

Session 1: Neuroanatomy & Neurobiology	8:00 AM – 9:30 AM	Lone Star A
Session 2: DEE Best Student Paper: Huey Award	8:00 AM – 10:00 AM	Lone Star B
Session 3: It's Not the Fall That Kills You, It's the LANDING	8:00 AM – 9:45 AM	Lone Star C
Session 4: Living in Syrup: Dealing with Viscosity	8:00 AM – 9:30 AM	Lone Star E
Session 5: Energy: Checks and Balances	8:00 AM – 9:45 AM	Lone Star H
Session 6: Sensory Neurobiology and Control	8:00 AM – 9:30 AM	Rooms 301-302
Session 7: Temperature Effects from Development to Life History	8:00 AM – 10:00 AM	Rooms 303-304
Session 8: Microbiome: Living with Multitudes	8:00 AM – 10:00 AM	Room 205
Session 9: Movement in Space	8:00 AM – 9:45 AM	Rooms 201-202
Session 10: DPCB Best Student Paper: Wake Award	8:00 AM – 10:00 AM	Rooms 402-403
Session 11: Predator Prey	10:15 AM – 12:00 PM	Lone Star A
Session 12: Species and Speciation	10:30 AM – 12:00 PM	Lone Star B
Session 13: Evolutionary Ecology and Life History	10:15 AM – 12:00 PM	Lone Star C
Session 14: DCB Best Student Paper: Mimi A.R. Koehl and Steven Wainwright Award	10:00 AM – 12:00 PM	Lone Star E
Session 15: Rising Star in Organismal Botany Award	10:00 AM – 12:00 PM	Lone Star F
Session 16: Undergraduate Education Success Stories	10:00 AM – 12:00 PM	Lone Star G
Session 17: Sensing, Signaling and Transduction	10:15 AM – 12:00 PM	Lone Star H
Session 18: Social Neuroethology	10:00 AM – 12:00 PM	Rooms 301-302
Session 19: Connubiality, Conjugality, or Civil Union? Symbiotic Relationships, Part I	10:00 AM – 11:00 AM	Rooms 303-304
Session 20: Population Variation in Life-history Traits	10:30 AM – 12:00 PM	Room 205
Session 21: Foraging: Memory and Mechanisms	10:00 AM – 12:00 PM	Rooms 201-202
Session 22: Evolution of Behaviour	10:30 AM – 12:00 PM	Rooms 402-403

AFTERNOON

Session 23: Evolutionary Ecology	1:45 PM – 3:00 PM	Lonestar A
Session 24: DEDE Best Student Paper Competition	1:30 PM – 3:30 PM	Lone Star B
Session 25: On the Wing	1:30 PM – 3:15 PM	Lone Star C
Session 26: Biological Rhythms	1:30 PM – 3:15 PM	Lone Star E
Session 27: DEDB Best Student Paper	1:30 PM – 3:30 PM	Lone Star F
Session 28: Make the Flow Go	1:30 PM – 3:15 PM	Lone Star G
Session 29: Biological Mousetraps: Springs and Latches	1:30 PM – 3:30 PM	Lone Star H
Session 30: Flying and Swimming Behaviour	1:30 PM – 3:15 PM	Rooms 301-302
Session 31: Connubiality, Conjugality, or Civil Union? Symbiotic Relationships, Part II	1:30 PM – 3:00 PM	Rooms 303-304
Session 32: (Eco)Energetics	1:30 PM – 3:30 PM	Room 205
Session 33: Plasticity	1:30 PM – 3:15 PM	Rooms 201-202
Session 34: Comparative Genomics and Phylogenetics of the Spineless	1:30 PM – 3:30 PM	Rooms 402-403

COMMITTEE AND BOARD MEETINGS

ICB Editorial Board	7:00 AM – 8:30 AM	Room 408
Division Chairs, President/President Elect	12:00 PM – 1:30 PM	Room 406
TCS Board Meeting	5:30 PM – 10:00 PM	Room 406
AMS Executive Committee Meeting	8:00 PM – 10:30 PM	Room 404

BUSINESS MEETINGS

DAB Meeting	5:45 PM – 6:30 PM	Lone Star E
DNNSB Meeting	5:45 PM – 6:30 PM	Lone Star F
DCPB Meeting	5:45 PM – 6:30 PM	Lone Star G
DVM Meeting	5:45 PM – 6:30 PM	Rooms 303-304
DEE Meeting	5:45 PM – 6:30 PM	Room 205
DEDE Meeting	5:45 PM – 6:30 PM	Rooms 201-202
DEDB Meeting	5:45 PM – 6:30 PM	Lone Star H

WORKSHOPS AND PROGRAMS

Student Postdoctoral Affairs Committee: "How-To?" Daily Booth	9:15 AM – 5:00 PM	Grand Ballroom
Public Affairs Committee Workshop: Embracing Variation Among Humans: Perspectives on LGBTQ+ Experiences in Biology and Academia	12:00 PM – 1:30 PM	Rooms 303-304
Workshop: Mentorship and Sponsorship: How to Curate Your Support Team and Guide Your Successful Career	12:00 PM – 1:30 PM	Rooms 301-302
DPCB Ask-An-Expert: Get Phylogenetic and Comparative Methods Support with an Expert	3:30 PM – 5:30 PM	Grand Ballroom
Broadening Participation Movie and Workshop: "Can We Talk? Difficult Conversations with Underrepresented People of Color: Sense of Belonging and Obstacles to STEM Fields" with Professor Kendall Moore	7:00 PM – 9:00 PM	Rooms 301-302

SOCIAL EVENTS

Morning Run	6:00 AM	JW Marriott Lobby
DCPB Social and BART Reception	8:00 PM – 10:00 PM	Griffin Hall

Saturday Program Symposia

Note: Presenter is first author unless noted by an asterisk (*).

7:45 AM – 3:30 PM **Symposium S1** **Rooms 203-204**

New Frontiers in Antarctic Marine Biology

Chairs: James McClintock, Charles Amsler

7:45 am	**S1-1**	*McClintock JB, Amsler CD, Baker B, Moran AL, Woods HA; University of Alabama at Birmingham, University of South Florida, University of Hawaii at Manoa, University of Montana*	Introduction to the Symposium: New Frontiers in Antarctic Marine Biology
8:00 am	**S1-2**	*Heiser S, Shilling AJ, Amsler CD, McClintock JB, Baker BJ; University of Alabama at Birmingham, University of South Florida*	Allies, Cheaters and Thieves: Macroalgal-Mesograzer Interactions on the Western Antarctic Peninsula
8:30 am	**S1-3**	*Polito MJ, Michelson CI, McMahon KW; Louisiana State University, University of Rhode Island*	Advances in the use of biogeochemical markers to track the diets and movement of Antarctic marine predators
9:00 am	**S1-4**	*Ziegler AF, Hahn-Woernle L, Powell B, Lundesgaard Ø, Cape M, Smith CR; University of Hawaii at Manoa, Norwegian Polar Institute, University of Washington*	From Glaciers to Benthos: Fjord Ecosystem Processes in a Changing Climate
9:30 am		**Coffee Break**	**Grand Ballroom**
10:00 am	**S1-5**	*Steinberg DK, Conroy JA, Thibodeau PS; Virginia Institute of Marine Science, College of William & Mary*	New Insights Into Patterns of Zooplankton Abundance Along the Rapidly Changing Western Antarctic Peninsula
10:30 am	**S1-6**	*Mahon AR, Halanych KM; Central Michigan University, Auburn University*	Revisiting phylogeographic patterns in Antarctica in the age of "-omics."
11:00 am	**S1-7**	*Countway PD, Matrai PA; Bigelow Laboratory for Ocean Sciences*	Antarctic Microbial Interactions Revealed by Continuous Flow Incubation and Variable Rates of DMSP Supply
11:30 am	**S1-8**	*Gast RJ, Sanders RW; Woods Hole Oceanographic Institution, Temple University*	You are what you eat: mixotrophic protists in Antarctic marine plankton communities
12:00 pm		**Lunch Break**	
1:30 pm	**S1-9**	*Young JN, Dawson HM, Rundell SM; University of Washington*	Responses of Antarctic Microalgae to Seasonal Shifts in Temperature and Salinity
2:00 pm	**S1-10**	*Hindle AG; University of Nevada Las Vegas*	Diving deep: Mechanistic insights into the extreme physiology of Antarctic seals
2:30 pm	**S1-11**	*Todgham AE; University of California Davis*	Two Plus Two Doesn't Equal Four: The Importance of Incorporating Realistic Environmental Variability in Understanding the Resilience of Antarctic Fishes to Climate Change
3:00 pm	**S1-12**	*Woods HA, Moran AL; University of Montana, University of Hawai'i at Mānoa*	Reconsidering the oxygen-temperature hypothesis of polar gigantism: successes, failures, and nuance
3:30 pm		**Coffee Break**	**Grand Ballroom**

7:45 AM – 3:30 PM **Symposium S2** **Brazos**

Epigenetic Variation in Endocrine Systems

Chairs: Haley Hanson, Tyler Stevenson

7:45 am	**S2-1**	*Hanson H, Martin LB, Stevenson TJ*; University of South Florida, University of Glasgow*	Introduction to Epigenetic Variation in Endocrine Systems
8:00 am	**S2-2**	*Hanson HE, Wang C, Schrey AW, Jiang RHY, Martin LB; University of South Florida, Georgia Southern Armstrong Campus*	Epigenetic Potential and DNA Methylation Across an Ongoing Avian Range Expansion
8:30 am	**S2-3**	*Lancaster LT, McCaw B, Areshi S, Leonard A, Moore B, Stevenson TJ; University of Aberdeen, University of Glasgow*	Epigenetic effects on thermal tolerance and resource use shifts in insects, with implications for range shift potential and life history syndromes

9:00 am	**S2-4**	*Eyck HJF, Sarma RR, Crino OL, Waters PD, Crossland M, Shine R, Rollins LA*; UNSW, Deakin University, Macquarie University*	Corticosterone response to experimental manipulation of methylation in invasive amphibian larvae
9:30 am	**Coffee Break**		**Grand Ballroom**
10:00 am	**S2-5**	*Rubenstein DR; Columbia University*	Epigenetic Programming and the Evolution of Adaptive Coping
10:30 am	**S2-6**	*Silvestre F, Carion A, Chapelle V, Voisin AS, Fellous A, Suarez-Ulloa V, Markay A, Hetru J, Goujon V, Wauthier E, Chatterjee A, Earley RL; University of Namur, University of Otago, University of Alabama*	The Self-Fertilizing Mangrove Rivulus as a Model Species in Environmental Epigenetics
11:00 am	**S2-7**	*Phelps SM; University of Texas at Austin*	Genetic and epigenetic influences on alternative tactics in the mostly monogamous prairie vole
11:30 am	**S2-8**	*Lindner M, VIltaniemi H, Van Oers K, Visser M,, Laine V, Verhagen I, Husby A*; Netherlands Institute of Ecology, University of Helsinki, Uppsala University*	Epigenetic regulation of seasonal timing of reproduction
12:00 pm	**Lunch Break**		
1:30 pm	**S2-9**	*Champagne FA; University of Texas at Austin*	Epigenetics and Reproductive Trade-offs in Response to Stress
2:00 pm	**S2-10**	*Van Oers K, Sepers B, Sies W, Gawehns-Bruning F, Laine VN, Verhoeven KJF; Netherlands Institute of Ecology (NIOO-KNAW)*	Epigenetic insights into the Heritability of Exploratory Behaviour in a Songbird
2:30 pm	**S2-11**	*Tolla E; University of Glasgow*	Rhythmic Neuroendocrine Expression of DNA Methyltransferase Enzymes in Seasonal Models
3:00 pm	**S2-12**	*Hunter RG; University of Massachusetts Boston*	Transposons, Stress and the Endocrinology of the Deep Genome
3:30 pm	**Coffee Break**		**Grand Ballroom**

8:00 AM – 3:30 PM **Symposium S3** **Lone Star D**

Biology at the Cusp: Teeth as a Model Phenotype for Integrating Developmental Genomics, Biomechanics, and Ecology

Chairs: Gareth Fraser, Darrin Hulsey

8:00 am	**S3-1**	*Hulsey CD; University of Konstanz*	The evolutionary developmental genetics of vertebrate tooth size
8:30 am	**S3-2**	*Miller CT; University of California Berkeley*	Developmental Genetic Analysis of Tooth Number Variation in Sticklebacks
9:00 am	**S3-3**	*Cohen KE, Weller HI, Summers AP; University of Washington, Brown University*	What is homodonty?
9:30 am	**Coffee Break**		**Grand Ballroom**
10:00 am	**S3-4**	*Brink KS, Chuong CM, Wu P, Richman J; University of British Columbia, University of Southern California*	Effects of Premature Tooth Extraction on Tooth Replacement Rates in *Iguana iguana*
10:30 am	**S3-5**	*Crofts SB, Smith SM, Anderson PLS; UIUC, Field Museum of Natural History*	Crushing and puncturing: biomechanics of tooth shape
11:00 am	**S3-6**	*Karagic N, Meyer A, Hulsey CD; University of Konstanz*	Plasticity of Vertebrate Dentition
11:30 am	**S3-7**	*Tucker AS; King's College London*	Developmental basis of tooth regeneration
12:00 pm	**Lunch Break**		
1:30 pm	**S3-8**	*Johanson Z, Underwood C, Manzanares E, Fernandez V, Clark B, Smith M; Natural History Museum, University of London, Universitat de Valencia, King's College*	Evolution of the Dentition in Sharks

2:00 pm	**S3-9**	*Bhullar BAS, Manafzadeh AR, Miyamae JA, Hoffman EA, Brainerd EL, Musinsky C, Crompton AW; Yale University, Brown U niversity, American Museum of Natural History, Harvard University*	The origin of chewing in mammals required rolling of the jaw and involved broad continuity in molar form and function
2:30 pm	**S3-10**	*Sadier A, Dessales R, Santana S, Sears K; UCLA, University of Washington*	Finding new rules for the patterning and shape of mammalian dentition: insights from Noctilionoid bats
3:00 pm	**S3-11**	*Fraser GJ, Thiery A, Martin KJ, James K, Cooper RL, Howitt C, Johanson Z; University of Florida, King's College, University of Sheffield, Natural History Museum*	Dental EvoDevOmics: Novel and conserved gene expression in shark tooth development

3:30 pm ..... **Coffee Break** ..... **Grand Ballroom**

Saturday Program Morning Sessions

Note: Presenter is first author unless noted by an asterisk (*).

8:00 AM – 9:30 AM **Session 1** **Lone Star A**

Neuroanatomy & Neurobiology

Chair: Ross DeAngelis

8:00 am	**1-1**	*McDonald MS, Cohen JH, Porter ML; University of Hawai'i at Mānoa, University of Delaware*	Evidence for Ultraviolet Vision in Larval Stomatopod Crustaceans
8:15 am	**1-3**	*Young BA; Kirksville College of Osteopathic Medicine*	CSF flow dynamics in *Alligator mississippiensis*: The role of the myodural bridge
8:30 am	**1-4**	*Tovar RU, Gignac PM; University of Texas at Austin, Oklahoma State University Center for Health Sciences*	The Comparative Anatomy ...of Degenerate Neural Structures Using Diffusible Iodine-based Contrast-enhanced Computed Tomography (diceCT)
8:45 am	**1-5**	*Deangelis RS, Rhodes JS; University of Texas, University of Illinois*	Nonapeptides Mediate Trade-Offs in Parental Care Strategy
9:00 am	**1-6**	*Vargas M, Martinez Acosta VG; Univ of the Incarnate Word, Marine Biological Laboratory*	Regeneration of Negative Phototactic Response in *Lumbriculus variegatus*
9:15 am	**1-7**	*Haney WA, Strother JA; University of Florida*	Time to Panic? Stressors modulate exploratory behavior in larval zebrafish

9:30 am ..... **Coffee Break** ..... **Grand Ballroom**

8:00 AM – 10:00 AM **Session 2** **Lone Star B**

DEE Best Student Paper: Huey Award

Chair: Cameron Ghalambor

8:00 am	**2-1**	*Klepac CN, Barshis DJ; Old Dominion University*	Decreased thermal tolerance in corals from high-frequency variable environments
8:15 am	**2-2**	*Powers SD, Thompson LM, Parry D, Grayson KL, Agosta SJ; Virginia Commonwealth University, Clemson University, State University of New York*	Climate-related variation in metabolic rate across the geographic range of an invasive ectotherm
8:30 am	**2-3**	*Naragon TH, Brückner A, Wijker RS, Sessions AL, Parker J; Caltech*	Cuticular hydrocarbons and the integration of myrmecophile rove beetles into ant colonies
8:45 am	**2-4**	*Chung AK, Cox RM, Logan ML, McMillan WO, Cox CL; University of California Los Angeles, University of Virginia, University of Nevada Reno, Smithsonian Tropical Research Institute, Georgia Southern University*	Sex-biased Gene Expression and Sexual Dimorphism in Anole Lizards
9:00 am	**2-5**	*Treidel LA, Clark RM, Williams CM; UC Berkeley, Sienna College*	Females pay the price: high costs of reproduction dictate sensitivity to diet quality in adult crickets

9:15 am	**2-6**	*Costello RA, Cook PA, Formica VA, Brodie III ED; University of Virginia, Swarthmore College*	Habitat Structure Influences Sex-Specific Patterns of Multilevel Selection in Experimental Populations of Forked Fungus Beetles
9:30 am	**2-7**	*Burford B, Wild L, Schwarz R, Kosma M, Chenoweth E, Sreenivasan A, Gilly W, Heintz R, Field J, Hoving HJ, Straley J, Denny M; Stanford University, University of Alaska Fairbanks, GEOMAR, University of Alaska Southeast, Alaska Fisheries Science Center, Southwest Fisheries Science Center*	Poleward proliferation of an inshore squid
9:45 am	**2-8**	*Barts N, Greenway R, Henpita C, Arndt S, Shaw J, Kelley J, Tobler M; Kansas State University, Oklahoma State University, University of Cambridge, Washington State University*	Repeated mitochondrial evolution underlies adaptation to extreme environments

10:00 am **Coffee Break** **Grand Ballroom**

8:00 AM – 9:45 AM **Session 3** **Lone Star C**

It's Not the Fall That Kills You, It's the LANDING

Chairs: Nicholas Smith, John Whitehead

8:00 am	**3-1**	*Brown CE, Deban SM, Dudley R, Sathe EA; University of South Florida, University of California, Berkeley*	Directed Aerial Descent in Arboreal Salamanders
8:15 am	**3-2**	*Duman A, Azizi E; University of California, Irvine*	Olympians of Controlled Deceleration: Cane Toads Stick the Landing Across Surface Stiffness
8:30 am	**3-3**	*Khandelwal PC, Hedrick TL; UNC Chapel Hill*	Gliding through clutter – obstacle-avoidance and path-planning in the flying lizard *Draco dussumieri*
8:45 am	**3-4**	*Smith NM, Dickerson AK; University of Central Florida*	Mosquitoes use multiple bounces to engage landing zones
9:00 am	**3-5**	*Kleinheerenbrink M, France LA, Taylor GK; University of Oxford*	Modelling the flight envelope for transition to an unpowered perching manoeuvre.
9:15 am	**3-6**	*Whitehead JG, Worrell TA, Socha JJ; Virginia Tech*	Influence of approach trajectory on water landings in mallards
9:30 am	**3-7**	*Tucker EL, Hsieh ST; Temple University*	Leg Length, Not Stiffness, Allows Bipedal Lizards To Navigate Drops

9:45 am **Coffee Break** **Grand Ballroom**

8:00 AM – 9:30 AM **Session 4** **Lone Star E**

Living in Syrup: Dealing with Viscosity

Chairs: Julie Cass, Terry Dial

8:00 am	**4-1**	*Dial TR, Lauder GV; Harvard University*	Longer Development Provides First-Feeding Fish with the Jaw Kinematics to Escape Hydrodynamic Constraints
8:15 am	**4-2**	*Matthews DG, Dial TR, Lauder GV; Harvard University*	Suction feeding in zebrafish is improved by upregulated Wnt signaling
8:30 am	**4-3**	*Ozalp MK, Miller LA, Strickland C; UNC Chapel Hill, UT Knoxville*	Plankton Dispersion Through Vegetative Seabed Within Complex Flow Environments
8:45 am	**4-4**	*Cass JA, Williams CD, Knijnenburg TA, Theriot J; Allen Institute for Cell Science, University of Washington*	A Bayesian framework for the detection of diffusive heterogeneity
9:00 am	**4-5**	*Li DH, Katija K, Gilly WF; Stanford University, Monterey Bay Aquarium Research Institute*	Hydrodynamic constraints on jet propulsion in squid paralarvae at intermediate Reynolds numbers
9:15 am	**4-6**	*Kasoju VT, Santhanakrishnan A; Oklahoma State University*	Bristled wings in fling: aerodynamic importance of initial inter-wing spacing

9:30 am **Coffee Break** **Grand Ballroom**

8:00 AM – 9:45 AM **Session 5** **Lone Star H**

Energy: Checks and Balances

Chairs: Callum Ross, Jim Usherwood

8:00 am	**5-1**	*Othayoth R, Thoms G, Li C; Johns Hopkins University*	Animals and robots transition from more challenging to easier locomotor modes to traverse obstacles
8:15 am	**5-2**	*Lynch J, Gau JF, Sponberg S, Gravish N; University of California San Diego, Georgia Institute of Technology*	Resonance Properties of Insect-Inspired Series-Elastic Flapping Wings
8:30 am	**5-3**	*Jorge J, Patek SN; Duke University*	Taking a swing at measuring small-scale, high acceleration impacts: a novel two-pendulum approach
8:45 am	**5-4**	*Jung SJ, Kim S, Wu B, Dombroskie J; Cornell University*	Shattering raindrops on biological surfaces (insect wings, bird feathers)
9:00 am	**5-5**	*Xu NW, Dabiri JO; Stanford University, California Institute of Technology*	Metabolic costs of enhancing propulsion in live biohybrid robotic jellyfish
9:15 am	**5-6**	*Usherwood JR; Royal Veterinary College, University of London*	The possibility of zero-work gaits in sprawled and parasagittal quadrupeds: insights from linkages of the industrial revolution
9:30 am	**5-7**	*Ross CF, Laird MF, Granatosky MC; University of Chicago, University of Southern California, New York College of Osteopathic Medicine*	Energetic costs of locomotion and feeding in capuchin primates.

9:45 am **Coffee Break** **Grand Ballroom**

8:00 AM – 9:30 AM **Session 6** **Rooms 301-302**

Sensory Neurobiology and Control

Chair: Noah Cowan

8:00 am	**6-1**	*Aiello BR, Sponberg S; Georgia Institute of Technology*	The visual perception of moving flowers during the flower tracking behavior in descending neurons in the hawkmoth, *Manduca sexta*
8:15 am	**6-2**	*Cellini BO, Mongeau JM; Pennsylvania State University*	Flexible visual control of gaze via head saccades in *Drosophila* flight
8:30 am	**6-3**	*Kéver L, Bass AH, Parmentier E, Chagnaud BP; Liège University, Cornell University, Ludwig-Maximilian University, University of Graz*	Conserved Neural Circuitry among Mochokid Catfish despite Morpho-Functional Diversity of Sonic and Electric Organs
8:45 am	**6-4**	*Yang Y, Pan Y, Uyanik I, Cowan NJ; Johns Hopkins University*	The Selection of Stimuli Affects Non-parametric System Identification for Refuge Tracking Behavior in *Eigenmannia virescens*
9:00 am	**6-5**	*Uyanik I, Sefati S, Cho K, Ankarali MM, Fortune ES, Cowan NJ*; Hacettepe University, Johns Hopkins University, Middle East Technical University, New Jersey Institute of Technology*	Variability in Locomotor Dynamics Reveals the Critical Role of Feedback in Task Control
9:15 am	**6-6**	*Lunsford ET, Liao JC; Whitney Laboratories for Marine Bioscience*	Lateral line activity is attenuated during the glide phase of intermittent swimming behavior

9:30 am **Coffee Break** **Grand Ballroom**

8:00 AM – 10:00 AM **Session 7** **Rooms 303-304**

Temperature Effects from Development to Life History

Chairs: Morgan Furze, Racine Rangel

8:00 am	**7-1**	*Thomas PA, Wheeler CR, Peele EE, Pabst DA, Yopak KE, Kinsey ST; UNC-Wilmington, University of Massachusetts Boston*	Effects of Elevated Temperature on Muscle Development in Juvenile Epaulette Sharks, *Hemiscyllium ocellatum*
8:15 am	**7-2**	*Bock SL, Lowers RH, Rainwater TR, Hale MD, Leri FM, Parrott BB; Univ of Georgia, Kennedy Space Center, Clemson Univ, Univ of Virginia*	Real-time responses to ecologically-relevant thermal fluctuations during temperature-dependent sex determination in the American alligator

8:30 am	**7-3**	*Weber CJ, Zhou Y, Lee JG, Looger L, Qian G, Ge C, Capel B; Duke University, Zhejiang Wanli University, HHMI Janelia Research Campus*	Temperature-dependent sex determination is mediated by pSTAT3 repression of *Kdm6b*
8:45 am	**7-4**	*Lidgard AD, French SS, Hudson SB; Utah State University*	Stress Sensitivity to Temperature in Plateau Side-blotched Lizards (*Uta stansburiana uniformis*): Implications for Immune Function
9:00 am	**7-5**	*Furze ME, Drake JE, Wiesenbauer J, Richter A, Pendall E; Harvard University, Yale University, State University of New York, University of Vienna, Western Sydney University*	Tracing Sugars Throughout Whole–Trees Exposed to Climate Warming
9:15 am	**7-6**	*Nash SB, Rahman SM; University of Texas Rio Grande Valley*	Short-term heat stress attenuates gonadal functions and induces apoptosis and oxidative stress in the American oyster, *Crassostrea virginica*: molecular mechanisms and signaling pathways
9:30 am	**7-7**	*Sykes BE, Balenger SL; University of Mississippi*	Nest Microclimate Manipulation Affects Growth, Development, and Heat-shock Protein Production in the Eastern Bluebird (Sialia sialis)
9:45 am	**7-8**	*Rangel RE, Sorte CJB; University of California Irvine*	Staying local: small-scale environmental history influences the metabolic response of marine invertebrates to increased temperature

10:00 am ..... **Coffee Break** ..... **Grand Ballroom**

8:00 AM – 10:00 AM **Session 8** **Room 205**

Microbiome: Living with Multitudes

Chairs: Gregory Demas, Sarah Gardner

8:00 am	**8-1**	*Mruzek JL, Dimos B, MacKnight N, Kathryn C, Brandt M, Mydlarz LD; University of Texas at Arlington, University of the Virgin Islands*	Linking Disease Resistance in Coral to its Ability to Maintain a Complex Microbiome
8:15 am	**8-2**	*Scott-Elliston A, Warne R; Southern Illinois University*	Modulation of the gut microbiome affects host developmental and stress response phenotypes
8:30 am	**8-3**	*Guidry ME, Reigel AM, Kelly MW; Louisiana State University*	Variation in the Microbiome of the Eastern Oyster: Environmental Influences and Effects on Oyster Health
8:45 am	**8-4**	*Morrison E, Deckard T, Adaniya K, Demas G; Indiana University*	Maternal gut dysbiosis via antibiotic administration affects the behavior of offspring Siberian hamsters (*Phodopus sungorus*)
9:00 am	**8-5**	*Hernandez J, Belden LK, Moore IT; Virginia Tech*	Sexual activity and the cloacal microbiome in female tree swallows
9:15 am	**8-6**	*Bo TB, Trevelline BK, Cabezas Ruiz S, Morrissey C, Marchant TA, Eng ML, Latta SC, Kohl KD; Univ of Pittsburgh, Univ of Saskatchewan, National Aviary*	Glucocorticoid Stress Hormones Affect the Gut Microbiota of Captive Birds
9:30 am	**8-7**	*Slevin MC, Fresin W, Cannataro G, Anderson RC; Florida Atlantic University*	Smarts and Symbiosis: Elucidating the Relationship between the Microbiome and Cognitive Performance in Birds
9:45 am	**8-8**	*Gardner SA, Arevalo L, Campbell P; University of California, Riverside, Oklahoma State University*	Characterizing the placental microbiome in mouse (*Mus*) hybrids

10:00 am ..... **Coffee Break** ..... **Grand Ballroom**

8:00 AM – 9:45 AM **Session 9** **Rooms 201-202**

Movement in Space

Chair: Marc Badger

8:00 am	**9-1**	*Badger MA, Perkes AD, Pfrommer BG, Wang Y, Modh A, Danllidis K, Schmidt MF; University of Pennsylvania*	From moments to months: Multi-timescale tracking and analysis of songbird social interactions in a smart aviary
8:15 am	**9-2**	*Kennedy JR, Mahadevan L, Nagpal R; Harvard University*	Mapping spatiotemporal changes of North American beaver (L. *Castor canadensis*) damming complexes

8:30 am	**9-3**	*Schulz AK, Ayala J, Zhao W, Rong H, Hu DL; Georgia Institute of Technology, Chengdu Panda Base for Giant Panda Breeding*	Panda Cub Climbing for Conservation
8:45 am	**9-4**	*Crall JD, Easton-Calabria A, Cronin K, Thuma J, Dey B, Ford Versypt A, De Bivort BL; Harvard University, Tufts University, Princeton University, Oklahoma State University*	The social scaling of stress-sensitivity: Understanding the impacts of pesticide exposure and temperature stress in bumblebee colonies
9:00 am	**9-5**	*Peters JM, Petersen KH; Cornell University*	Honeybee swarms use a flow-mediated pheromone signaling scheme to coordinate aggregation
9:15 am	**9-6**	*Nave GK, Tallackson H, Peleg O; University of Colorado, Boulder*	The Formation of Honey Bee Swarms
9:30 am	**9-7**	*Wagner JM, Parker J; California Institute of Technology, Pasadena*	Chemical Cues Underly an Interspecies Symbiosis by Triggering a Modular Social-Behavioral Program

9:45 am ..... **Coffee Break** ..... **Grand Ballroom**

8:00 AM – 10:00 AM Session 10 — Rooms 402-403

DPCB Best Student Paper: Wake Award

Chair: Todd Oakley

8:00 am	**10-1**	*Baker CM, Boyer SL, Giribet G; Harvard University, Macalester College*	Phylogenomics and Biogeography of the Gondwanan Vicariant Harvestman Family Pettalidae (Arachnida, Opiliones)
8:15 am	**10-2**	*Corn KA, Martinez CM, Burress ED, Wainwright PC; Univ of California, Davis*	High rates of evolution of cranial mobility are characteristic of suction feeding
8:30 am	**10-3**	*Zapfe KL, Larouche O, Price SA; Clemson University*	Macroevolutionary Relationships Between High Contrast Patterns and Body Shape in Teleost Fishes
8:45 am	**10-4**	*King TK, Brown JM; Louisiana State University*	Identifying Atypical Modes of Continuous Trait Evolution
9:00 am	**10-5**	*Nix RM, Thueson K, Rabinowitz S, Havird JC; Baylor University, University of Texas at Austin*	How do mitochondrial genes with high mutation rates remain functional?
9:15 am	**10-6**	*Bardua C, Bon M, Fabre AC, Das K, Herrel A, Stanley EL, Blackburn DC, Goswami A; NHM, London, MfN, Berlin, MNHN, Paris, FMNH, Florida*	Macroecology and Morphological Evolution of the Frog Skull
9:30 am	**10-7**	*Friedman ST, Collyer ML, Price SA, Wainwright PC; University of California Davis, Chatham University, Clemson University*	Divergent processes drive parallel evolution in marine and freshwater fishes
9:45 am	**10-8**	*Nordén KK, Eliason CM, Stoddard MC; Princeton University, Field Museum of Natural History*	Do diverse feather nanostructures increase the colorfulness of iridescent plumage?

10:00 am ..... **Coffee Break** ..... **Grand Ballroom**

10:15 AM – 12:00 PM Session 11 — Lone Star A

Predator Prey

Chair: Dale Stevens

10:15 am	**11-1**	*Goldberg DL, Bassingthwaite TA, Beilke S, Ward MP, Capparella AP; Illinois State University, Audubon Great Lakes, University of Illinois at Urbana-Champaign*	Never Cry Owl: Rails do not Adjust Vocal Activity Rates in Response to Predation Risk
10:30 am	**11-2**	*Stevens II DR, Graham MA, Badjis CB, Mason JN, Baker JA, Foster SA; Clark University*	Differences in behavioral plasticity among populations of threespine stickleback experiencing a novel predation threat.
10:45 am	**11-3**	*Michels NO, Hrabik TR, Mensinger AF; University of Minnesota Duluth*	To Flee or Not to Flee: A Comparison of Predator Avoidance Behaviors Under Varied Light and Predatory Conditions
11:00 am	**11-4**	*Gripshover ND, Jayne BC; University of Cincinnati*	Feeding of Crayfish Snakes: A Model System for Testing the Roles of Predator Anatomy and Behavior on Foraging Ecology

11:15 am	**11-5**	*Whitford MD, Freymiller GA, Higham TE, Clark RW; San Diego State University, University of California, Riverside*	The Effects of Temperature on the Predatory and Defensive Strikes of Rattlesnakes
11:30 am	**11-6**	*Goeppner SR, Luttbeg B; Oklahoma State University*	Growth, lifespan, and reproductive investment of *Physa* snails exposed to predators
11:45 am	**11-7**	*Drown RM, Anderson CV; University of South Dakota*	Does individual performance influence antipredator behavioral strategy choice in chameleons?

12:00 pm **Lunch Break**

10:30 AM – 12:00 PM **Session 12** **Lone Star B**

Species and Speciation

Chair:

10:30 am	**12-1**	*Lord NP, Weller HI, Sharkey CR; Louisiana State University, Brown University, University of Minnesota*	The Color of Jewels: Evolution of Color Patterns Across a Speciose Lineage of Jewel Beetles
10:45 am	**12-2**	*Kelly JB, Thacker RW; Stony Brook University*	Ecological divergence in the sponge genus *Ircinia*
11:00 am	**12-3**	*Myers CR; University of California Los Angeles*	Towards a synthesis on insect host selection and speciation
11:15 am	**12-4**	*Martin CM; University of California, Berkeley*	How to investigate the origins of novelty: insights gained from ecology, genomics, function, and fitness landscapes
11:30 am	**12-5**	*Gibson JD, Botnaru L, Cobb BA; Georgia Southern University*	Mortality and Physiology of *Nasonia* Hybrids
11:45 am	**12-6**	*Kuhn BF, Salesa MJ, Mauricio A, Argant A, Randoph-Quinney P, Kgasi L, Gommery D; University of Johannesburg, Museo Nacional de Ciencias Naturales-CSIC, Aix Marseille Univ, LAMPEA, University of Central Lancanshire, Ditsong National Museum of Natural History, Sorbonne Université*	Evidence for an African Cave Lion (Panthera sp): Multiple Panthera individuals from Bridge Cave, Bolt's Farm, South Africa

12:00 pm **Lunch Break**

10:15 AM – 12:00 PM **Session 13** **Lone Star C**

Evolutionary Ecology and Life History

Chair:

10:15 am	**13-1**	*Somjee U, Anzaldo S, Marting PM, Painting CJ, Powell E, Hickey T; Smithsonian Tropical Research Institute, Arizona State University, University of Auckland, University of Waikato*	Extreme size variation in an armed weevil sheds light on the relationship between body mass and metabolic rate
10:30 am	**13-2**	*Powers MJ, Weaver RJ, Heine KB, Hill GE; Auburn University, University of Texas at Austin, Auburn University*	First clutch size is a reliable proxy for reproductive success in a marine copepod
10:45 am	**13-3**	*Sorlin MV, Marks JR, Johnson MA, Husak JF, Lailvaux SP; University of New Orleans, Trinity University, University of Saint Thomas*	Effect of Exercise Training on Brain Allometry and Cognitive Abilities in *Anolis carolinensis*
11:00 am	**13-4**	*Mugel SG, Naug D; Colorado State University*	Metabolic Rate Variation Shapes Pace of Life Traits at Both the Individual and the Group Level
11:15 am	**13-5**	*Mainwaring MC, Martin TE, Wolf BO, Tobalske BW; University of Montana, University of New Mexico*	Nests reduce the energetic costs of brooding offspring for passerine birds in the tropics
11:30 am	**13-6**	*Boggs CL; University of South Carolina, Rocky Mountain Biological Lab*	Trans-generational Ecological Determinants of Egg Composition in the Butterfly *Speyeria mormonia*
11:45 am	**13-7**	*Calede J; Ohio State University*	Evidence for a Semi-Aquatic Ecology in a 30-Million-Year-Old Beaver and the Evolution of Locomotion in Castoridae

12:00 pm **Lunch Break**

10:00 AM – 12:00 PM **Session 14** **Lone Star E**

DCB Best Student Paper: Mimi A.R. Koehl and Steven Wainwright Award

Chair: Stacey Combes

10:00 am	**14-1**	*Manafzadeh AR, Kambic RE, Gatesy SM; Brown Univ, Johns Hopkins Univ*	How informative is joint mobility? A 3-D analysis of potential versus realized joint poses in archosaurs
10:15 am	**14-2**	*Crane RL, Denny MW; Stanford University*	Resistance and Repair of Mechanical Fatigue in Mussel Shells
10:30 am	**14-3**	*Kahane-Rapport SR, Savoca MS, Cade DE, Segre PS, Bierlich KC, Calambokidis J, Friedlaender AS, Johnston DW, Werth AJ, Goldbogen JA; Stanford University, Duke University, Cascadia Research Collective, University of California, Santa Cruz, Hampden-Sydney College*	From Feast Mode to Least Mode: How Lunge Filter Feeding Biomechanics Constrain Rorqual Foraging Ecology Across Scale
10:45 am	**14-4**	*Jacobs C, Day S, Holzman R; Tel Aviv University, Rochester Institute of Technology*	A power amplification dyad in Syngnathidae
11:00 am	**14-5**	*Sleboda DA, Wold ES, Roberts TJ; Brown University*	The Hydrostatic Skeleton of Muscle
11:15 am	**14-6**	*Harrison JS, Porter ML, Patek SN; Duke University, University of Hawai'i, Manoa*	Scaling and development of elastic mechanisms: the tiny strikes of larval mantis shrimp
11:30 am	**14-7**	*Stark AY; Villanova University*	Gans Award Lecture: Tenacious Toes and Fastening Feet: Biological Adhesive Systems in Complex Environments

12:00 pm **Lunch Break**

10:00 AM – 12:00 PM **Session 15** **Lone Star F**

Rising Star in Organismal Botany Award

Chair: Janet Steven

10:00 am	**15-1**	*Morrison CR, Smiley J; University of Texas at Austin, University of California San Diego*	Using a Portable Hydrogen Cyanide Gas Meter to Uncover a Dynamic Phytochemical Landscape
10:15 am	**15-2**	*Blumstein MB, Richardson AR, Weston D, Zhang J, Wellington M, Hopkins R; Harvard University, Northern Arizona University, Oak Ridge National Laboratory*	A new perspective on ecological prediction reveals limits to climate adaptation in a temperate tree species
10:30 am	**15-3**	*Monroe JG, McKay JK; Max Planck Institute for Developmental Biology, Colorado State University*	From satellites to sequences: investigating drought adaptive life history evolution in plants
10:45 am	**15-4**	*Gorman CE, Bond L, Van Kleunen M, Dorken M, Stift M; University of Konstanz, Trent University, Taizhou University*	Phenological and pollinator-mediated isolation among selfing and outcrossing *Arabidopsis lyrata* populations
11:00 am	**15-5**	*Babin CH, Bell CD; University of New Orleans*	A global molecular phylogeny of chromosomal evolution in wild onions (*Allium*, Amaryllidaceae)
11:15 am	**15-6**	*Zumajo-Cardona C, Ambrose BA; New York Botanical Garden, Graduate Center-CUNY*	Evolution of the integument and its implication in seed plant evolution.
11:30 am	**15-7**	*Min Y, Ballerini ES, Kramer EM; Harvard University, Sacramento State University*	Understanding Floral Meristem Termination by Exploring Genetic Architecture Underlying Stamen Whorl Numbers in *Aquilegia*
11:45 am	**15-8**	*Katzer AM, Wessinger CA, Hileman LC; University of Kansas*	Nectary size is a pollination syndrome trait in *Penstemon*

12:00 pm **Lunch Break**

10:00 AM – 12:00 PM **Session 16** **Lone Star G**

Undergraduate Education Success Stories

Chairs: Christopher Martine, Jasmine Coyle

10:00 am	**16-1**	*English P, Silverthorn DU*; University of Texas at Austin*	The Minimal Marking Technique: Grading Writing Assignments while Promoting Active Learning
10:15 am	**16-2**	*Yen J, Li W; Georgia Tech*	Bio Inspired Design: translating biology to engineering and design
10:30 am	**16-3**	*Pask GM; Bucknell University*	Working to Learn: Applying Labor-Based Assessment to Scientific Writing and Laboratory Courses
10:45 am	**16-4**	*Killion KD; Blinn College*	Getting Undergrads to Write the Something
11:00 am	**16-5**	*Mineo PM, Hebert AK, Bennett KF, Guenther MF, Ksiazek-Mikenas K, Raimondi SL; Elmhurst College*	Implementing Vision and Change into the first-year biology sequence for majors.
11:15 am	**16-6**	*Martine CT, Kell A; Bucknell University*	Cross-pollination: Art & Sex through the Lens of Botany
11:30 am	**16-7**	*Sharpe SL; Kansas State University*	Creating LGBTQIA+ Inclusive Biology Curricula and Classrooms
11:45 am	**16-8**	*Coyle JA, Lolavar AA, Meredith TL; Florida Atlantic University*	Developing a multidisciplinary, undergraduate research training program for dual enrolled students
12:00 pm		**Lunch Break**	

10:15 AM – 12:00 PM **Session 17** **Lone Star H**

Sensing, Signaling and Transduction

Chair: James Newcomb

10:15 am	**17-1**	*Harris OK, Kingston ACN, Steichmann NR, Johnsen S, Speiser DI*; University of Cincinnati, University of South Carolina, Duke University*	How and why are the blue eyes of scallops blue?
10:30 am	**17-2**	*Hall BE, Bigman JS, Bedore CN; Georgia Southern University, Simon Fraser University*	Allometric relationships in the visual ecology of sharks
10:45 am	**17-3**	*Briscoe AD, Macias-Muñoz A, Rangel-Olguin AG; University of California, Irvine*	Evolution of Phototransduction Genes in Lepidoptera
11:00 am	**17-4**	*Smedley GD, Serb JM; Iowa State University*	Molluscan Transcriptomes Suggest a More Complex Visual Cycle Homologous to Vertebrates
11:15 am	**17-5**	*Kozma MT, Ngo-Vu H, Senatore A, Bobkov Y, Ache BW, Derby CD; Georgia State Univ, Univ of Toronto, Mississauga, Univ of Florida*	Single Cell Transcriptomics Reveals Expression Patterns of Chemoreceptor Genes in Olfactory Receptor Neurons of the Caribbean Spiny Lobster, *Panulirus argus*
11:30 am	**17-6**	*Lebow CL, Burt DB, Taylor J; Stephen F Austin State University*	Glare Reduction Properties of Dark Avian Facial Markings
11:45 am	**17-7**	*Newcomb JM, Gingras MA, Nelson SN, McGhee CB, Easter JH, Goodheart JA, Ramirez MD; New England College, University of California, Santa Barbara, University of Massachusetts, Amherst*	Nudibranch opsins: identification, localization and potential roles in extraocular photoreception and circadian rhythms
12:00 pm		**Lunch Break**	

10:00 AM – 12:00 PM **Session 18** **Rooms 301-302**

Social Neuroethology

Chair: Scott MacDougall-Shackleton

10:00 am	**18-1**	*Rogers LS, Van Wert JC, Mensinger AF; University of Minnesota Duluth, Marine Biological Laboratory*	Multimodal sensory integration of the utricle in freely swimming toadfish, *Opsanus tau*
10:15 am	**18-2**	*Clements KN, Heagy FK, Blain E, Ward J, Issa FA; East Carolina University*	Repeated Social Defeat Affects Dopaminergic Modulation of Spinal Motor Circuits
10:30 am	**18-3**	*Bentz AB, George EM, Wolf SE, Rusch DB, Buechlein A, Rosvall KA; Indiana University*	Immediate and lasting neurogenomic responses to competition in a free-living songbird: an experimental manipulation of a dynamic social environment

10:45 am	**18-4**	*Butler JM, Herath E, Whitlow SM, Rimal A, Maruska KP; Louisiana State University*	Honey, I Ate the Kids: Role of *Galanin* in Maternal Care, Infanticide, and Energetics in a Mouthbrooding Fish
11:00 am	**18-5**	*Enns JL, Purdey L, Stojkovic L, Williams TD; Simon Fraser University*	Is Coordination Key? Investigating the Timing of Provisioning Visits in a Biparental Songbird Species
11:15 am	**18-6**	*Payette WI, Richter MM, Hodinka BL, Pullum KB, Ashley NT; Western Kentucky University, Simon Fraser University, University of Pennsylvania*	Effect of sleep on loss on parental care in Arctic-breeding songbirds
11:30 am	**18-7**	*Fischer EK, Pierson E, Petrillo R, Ellis G, Lagerstrom KM, O'Connell LA; Stanford University, Harvard University*	Tadpole Fight Club: Neural Mechanisms of Juvenile Aggression in Poison Frogs
11:45 am	**18-8**	*Diez A, MacDougall-Shackleton SA*; University of Western Ontario*	Neurogenesis and the development of neural sex differences in vocal control regions of songbirds
12:00 pm		**Lunch Break**	

10:00 AM – 11:00 AM **Session 19** **Rooms 303-304**

Connubiality, Conjugality, or Civil Union? Symbiotic Relationships, Part I

Chair: Kenneth Halanych

10:00 am	**19-1**	*Halanych KM, Li Y, Tassia MG, Waits DS, Bogantes VE, David KT; Auburn University*	The Genome of Deep-Sea Seep-Dwelling *Lamellibrachia luymesi* (Siboglinidae) and Clues on Chemosynthetic Symbiosis
10:15 am	**19-2**	*Haynes L, Beveridge J, Fish O, Giambrone SA, Reed L, Scott Chialvo C*; University of Alabama, Appalachian State University*	Characterizing the Impact of a Complex Mix of Toxins on Survival in *Drosophila* Species
10:30 am	**19-3**	*Ohdera AH, Sharp V, Watson K, Steinworth B, Diaz-Almeyda E, Poole AZ, Fitt W, Martindale MQ, Medina M; Pennsylvania State University, University of Florida, New College of Florida, Berry College, University of Georgia*	Alterations in transcriptional and developmental regulation: Evolutionary implication of symbiosis in *Cassiopea xamachana*
10:45 am	**19-4**	*Fontaine SS, Kohl KD; University of Pittsburgh*	Temporal effects of temperature on tadpole gut microbial communities
11:00 am		**Lunch Break**	

10:30 AM – 12:00 PM **Session 20** **Room 205**

Population Variation in Life-history Traits

Chairs: Mark Garcia, Talene Yeghissian

10:30 am	**20-1**	*Fudickar AM, Brewer DE; Indiana University*	Distance Matters: Experimental Test of the Influence of Avian Migration Distance on Readiness to Breed in Spring
10:45 am	**20-2**	*Delclos PJ, Meisel RP; University of Houston*	Genotype-by-temperature effects on thermal preference in the house fly *Musca domestica*
11:00 am	**20-3**	*Garcia MJ, Teets NM; University of Kentucky*	Genetic Variation and Molecular Regulation of Cold Hardiness in Spotted Wing Drosophila
11:15 am	**20-4**	*Awde DN, Lecheta MC, Unfried LN, Jacobs NA, Powers B, Bora K, Waters JS, Axen HJ, Frietze SE, Lockwood BL, Cahan SH, Teets NM; University of Kentucky, University of Vermont, Providence College, Salve Regina University NM*	Genetic mechanisms of basal thermal tolerance in *Drosophila melanogaster*
11:30 am	**20-5**	*Wong S, Bigman JS, Dulvy NK; Simon Fraser University*	Ontogenetic scaling of gill area and brain size between two populations of blacktip shark (*Carcharhinus limbatus*)
11:45 am	**20-6**	*Yeghissian TG, Darnell MZ; University of Southern Mississippi*	Impact of Thermal-Hydric Stress on Surface Activity and Waving Behavior of Fiddler Crabs
12:00 pm		**Lunch Break**	

10:00 AM – 12:00 PM Session 21 **Rooms 201-202**

Foraging: Memory and Mechanisms

Chair: Caroline Strang

10:00 am	**21-1**	*Muth F, Francis JS, Leonard AS; University of Texas at Austin, University of Nevada*	Bumblebee cognition and the influence of anthropogenic stressors
10:15 am	**21-2**	*Strang CG, Brown EK, Sherry DF, Hampton RR; University of Western Ontario, Emory University*	Memory systems in food-caching caching and non-caching birds
10:30 am	**21-3**	*Cade DE, Carey N, Domenici P, Potvin J, Goldbogen JA; Stanford University, Scottish Association of Marine Science, IAS-CNR, Istituto per l'Ambiente Marino Costiero, Saint Louis University*	Predator-informed looming stimulus experiments reveal how large filter feeding whales capture highly maneuverable forage fish
10:45 am	**21-4**	*Behbahani AH, Rak AK, Skutt-Kakaria KJ, Dickinson MH; California Institute of Technology*	Flies Remember Multiple Food Locations in the Absence of External Cues
11:00 am	**21-5**	*Mora YA, Sustaita D, Farabaugh SM; California State University San Marcos, San Diego Zoo Global*	Analysis of Loggerhead Shrike wing-flashing movements during hunting
11:15 am	**21-6**	*Law CJ, Tinker MT, Fujll JA, Nicholson T, Staedler M, Tomoleoni J, Young C, Mehta RS; American Museum of Natural History, Nhydra Ecological Consulting, Monterey Bay Aquarium, US Geological Survey, California Department of Fish and Wildlife, University of California Santa Cruz*	Tool use increases mechanical and bioenergetic foraging success in southern sea otters
11:30 am	**21-7**	*Johnson MW, Tricomo AS, Shough AE, Sanders JC, Cohen SC; San Francisco State University, Humboldt State University, University of Portland, Southern Illinois University Edwardsville*	Investigating the Foraging Behavior of *Leptasterias* spp. Across Intertidal Microhabitats
11:45 am	**21-8**	*Paggeot LX, Gosliner TM; California Academy of Sciences*	Stinger Thieves: Nematocyst Acquisition Process in Aeolid Nudibranchs

12:00 pm **Lunch Break**

10:30 AM – 12:00 PM Session 22 **Rooms 402-403**

Evolution of Behaviour

Chair: Angela Freeman

10:30 am	**22-1**	*Phipps N, Stein LR, Hoke K; Colorado State University, University of Oklahoma*	Genetic Background and Sexual Experience Jointly Determine Courtship Strategy
10:45 am	**22-2**	*Young RL, Hofmann HA; University of Texas at Austin*	Leveraging Network Analysis to Study the Evolution of Sociality in Vertebrates
11:00 am	**22-3**	*Culumber ZW; University of Alabama in Huntsville*	Variation in Animal Personality Across a Major Environmental Gradient
11:15 am	**22-4**	*Bensky MK, Bell AM; University of Illinois Urbana-Champaign*	The evolution of cognition and behavior during a natural biological invasion
11:30 am	**22-5**	*Schumm MR, Cummings ME, Ramsey ME; UT*	Testing cognitive flexibility in non-model organisms: Poeciliid fishes vary by species, sex and context in detour performance
11:45 am	**22-6**	*Freeman AR, Ophir AG, Sheehan MJ; Cornell University*	Doing more with less: African giant pouched rats specialize in olfaction with a typical olfactory receptor repertoire

12:00 pm **Lunch Break**

Saturday Program Afternoon Sessions

Note: Presenter is first author unless noted by an asterisk (*).

1:45 PM – 3:00 PM **Session 23** **Lonestar A**

Evolutionary Ecology

Chair: Patrick Kelly

1:45 pm	**23-2**	*Kelly PW, Pfennig DW, Pfennig KS; UNC Chapel Hill*	Sexual Selection and Adaptive Evolution in Variable Environments: Phenotypic Plasticity as a Good-Genes Effect
2:00 pm	**23-3**	*King RW, Wund MA, Foster SA, Baker JA; Clark University, University of New Jersey*	Salinity mediated shape plasticity in oceancic threespine stickleback
2:15 pm	**23-4**	*Rippe JP, Dixon GB, Matz MV; University of Texas at Austin*	Genomic evidence of environmental specialization and cryptic speciation in two massive coral species on the Florida Keys Reef Tract
2:30 pm	**23-5**	*Wilson LE, Curlis JD, Lonsdale G, Cox CL; Georgia Southern University, University of Michigan, University of Plymouth, Florida International University*	The role of sympatry on predator-based selection on coral snake mimicry components in the montane tropics
2:45 pm	**23-6**	*Griffiths JS, Johnson KM, Kelly MW; Louisiana State University*	Evolutionary Change in the Oyster, *Crassostrea virginica*, Following an Experimental Low Salinity Event

3:00 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:30 PM **Session 24** **Lone Star B**

DEDE Best Student Paper Competition

Chairs: Dan Becker, Daniel Becker

1:30 pm	**24-1**	*Kernbach ME, Unnasch TR, Martin LB; University of South Florida*	Differential Effects of Spectral Composition of Nighttime Lighting on West Nile Virus Resistance and Mortality in House Sparrows
1:45 pm	**24-2**	*Thublin RN, Moore PA; Bowling Green State University, University of Michigan*	Crayfish self-medication: crayfish alter their feeding preferences based on parasite loads
2:00 pm	**24-3**	*Amonett SD, Balenger SL; University of Mississippi*	Mother Knows Best: Immune-based Maternal Effects in Response to *Mycoplasma gallisepticum* Infection in Eastern Bluebirds (*Sialia sialis*)
2:15 pm	**24-4**	*Dimos BA, MacKnight NJ, Brandt M, Mydlarz LD; University of Texas at Arlington, University of the Virgin Islands*	Differential Disease Susceptibility Between Closely Related Coral Species is due to Regulation of Mitochondrial Genes
2:30 pm	**24-5**	*Slama SL, Sandmeier FC, Sheedy MD, Painter MN; Colorado State University Pueblo*	Quantifying Phagocytic Activity of Lymphocytes in Ectotherms
2:45 pm	**24-6**	*Houtz JL, Shipley JR, Zimmer C, Vitousek MN; Cornell University, Max Planck Institute of Animal Behavior*	Impacts of Gut Microbiota on Developmental Temperature Priming in Birds
3:00 pm	**24-7**	*MacKnight NJ, Dimos BA, Brandt M, Muller E, Mydlarz L; University of Texas at Arlington, University of Virgin Islands, Mote Marine Laboratory*	The species-specific and shared immune competence of seven Caribbean coral when exposed to white plague disease
3:15 pm	**24-8**	*Names G, Krause J, Schultz E, Hunt K, Heal M, Hahn T, Cornelius J, Wingfield J; Univ of California, Davis, Univ of Nevada, Reno, Wittenberg Univ, George Mason Univ, Bangor Univ, Oregon State Univ*	Immunological consequences of circulating corticosterone: an experimental investigation comparing avian malaria-tolerant and -susceptible Hawaii Amakihi (*Hemignathus virens*)

3:30 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:15 PM **Session 25** **Lone Star C**

On the Wing

Chairs: Aimy Wissa, Tomer Urca

1:30 pm	**25-1**	*Bustamante J, Ahmed M, Daniel TL; University of Washington*	Restricting abdominal flexion yields poor flight performance in hawkmoths
1:45 pm	**25-2**	*Urca T, Ribak G; Tel-Aviv University*	The Effect of Body Mass on Long-Distance Flight Efficiency in a Wood Boring Beetle, the 'Mango Stem Borer', Batocera Rufomaculata.
2:00 pm	**25-3**	*McCarty B, Matthews M, Sponberg S; Georgia Institute of Technology*	Flexibility Maintains Leading-edge Vortex Structure on *Manduca* Wings
2:15 pm	**25-4**	*Schwab RK, Jankauski MA; Montana State University*	Efficient Modeling of Fluid-Structure Interaction in Single Degree-of-Freedom Flapping Wings
2:30 pm	**25-5**	*Cheney JA, Song J, Windsor SP, Stevenson JPJ, Dierksheide D, Nila A, Bomphrey RJ, Usherwood JR; Royal Veterinary College, Dongguan University of Technology, University of Bristol, LaVision GmbH, LaVision UK Ltd*	The tails of gliding birds disrupt induced drag minimization and instead approach optimal viscous drag minimization
2:45 pm	**25-6**	*Williamson CJ, Spelt A, Windsor SP*; University of Bristol*	Are complex wind fields beneficial for soaring? An urban gull's perspective
3:00 pm	**25-7**	*Wissa AA; University of Illinois Urbana-Champaign*	Aerodynamic Characterization of a Leading-Edge Alula-Inspired Device

3:15 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:15 PM **Session 26** **Lone Star E**

Biological Rhythms

Chair: Helen Chmura

1:30 pm	**26-1**	*Wingfield JC, Reid AMA, Perez JH, Bishop VR, Krause JS, Meddle SL; University of California, Roslin Institute University of Edinburgh, University of Glasgow, University of Nevada Reno*	Divergence of Hypothalamic-pituitary-gonadal (HPG) Axis Gene Expression and Testosterone in Migrant and Resident Female White-crowned Sparrows
1:45 pm	**26-2**	*Chmura HE, Duncan CM, Barnes BM, Buck CL, Christian HC, Loudon AS, Williams CT; University of Alaska Fairbanks, Northern Arizona University, Oxford University, University of Manchester*	Reimagining the hibernating brain: Hypothalamic remodeling in an arctic hibernator
2:00 pm	**26-3**	*Bilak JD, Whiles MR, Milanovich JR, Bystriansky JS, Warne RW; Southern Illinois University, Shedd Aquarium*	Understanding the physiological mechanisms causing seasonal movement changes in common mudpuppies.
2:15 pm	**26-4**	*Shankar A, McCahon S, Callegari K, Seitz T, Drown D, Williams CT; University of Alaska Fairbanks*	SAD rats: Effects of short photoperiod on sleep disruption, the gut microbiome, and carbohydrate consumption in diurnal grass rats
2:30 pm	**26-5**	*Kahn AS, Pennelly CW, Leys SP; Moss Landing Marine Laboratories, University of Alberta*	Factors Affecting the Behaviors of Sessile Animals on the Deep Seafloor
2:45 pm	**26-6**	*Fissette SD, Bussy U, Huerta B, Li W; Michigan State University*	Diel Pattern of Pheromone Production and Release in Sea Lamprey, *Petromyzon marinus*
3:00 pm	**26-7**	*Hernandez E, Vázquez O, Torruco A, Rahman MD; University of Texas Rio Grande Valley*	Histological evidence of annual and lunar reproductive rhythms of Atlantic sea urchin, *Arbacia punctulata* in the southern Gulf of Mexico: changes in nutritive phagocytes in relation to gametogenesis

3:15 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:30 PM **Session 27** **Lone Star F**

DEDB Best Student Paper

Chair: Kim Hoke

1:30 pm	**27-1**	*Pomerantz AF, Kishi Y, Pinna C, Elias M, Patel NH; University of California Berkeley, California Institute of Technology, Museum National d'Histoire Naturelle, Marine Biological Laboratory*	Making it Clear: Evolution and Development of Wing Transparency in Lepidoptera
1:45 pm	**27-2**	*Nunez SA, Sanger TJ; Loyola University Chicago*	The Physiological Basis of Structural Malformations in Thermally Stressed Lizard Embryos
2:00 pm	**27-3**	*Morris ZS, Pierce SE, Abzhanov A; Harvard University, Imperial College London*	Developmental mechanisms shaping crocodylian snouts
2:15 pm	**27-4**	*Steinworth BM, Martindale MQ, Ryan JF; University of Florida*	The evolution of cnidarian and bilaterian Hox genes
2:30 pm	**27-5**	*Lanza AR, Seaver EC; University of Florida*	Activin/Nodal signaling is required for establishing the dorsal-ventral axis in *Capitella teleta*
2:45 pm	**27-6**	*Zang H, Nagayasu N; Lyon College, University of Arkansas*	The evolution of novel neuropeptides in Cnidaria: investigating the function of a lineage-specific neuropeptide RPamide during sea anemone development
3:00 pm	**27-7**	*Guernsey MW, Van Kruistum H, Reznick DN, Pollux BJA, Baker JC; Stanford University School of Medicine, Wageningen University, University of California, Riverside, Wageningen University*	*Poeciliopsis* maternal follicle transcriptomes reveal importance of placenta and secretory genes in the emergence of live-birth
3:15 pm	**27-8**	*Senevirathne G, Baumgart S, Shubin NH, Hanken J; University of Chicago, Laboratory Schools, Harvard University*	Ontogeny of the anuran urostyle: the developmental context of evolutionary novelty

3:30 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:15 PM **Session 28** **Lone Star G**

Make the Flow Go

Chair: Konstantin Kornev

1:30 pm	**28-1**	*Kaczmarek EB, Li EY, Brainerd EL; Brown University*	XROMM Analysis of Air-Breathing in the Royal Knifefish, *Chitala blanci*
1:45 pm	**28-2**	*Grand Pre CA, Hedrick BP, Schachner ER; Louisiana State University Health Science Center*	Movement and Function of the Hepatic-Piston Pulmonary Apparatus During Various Modes of Respiration in the American Alligator (*Alligator mississippiensis*)
2:00 pm	**28-3**	*Cieri RL, Farmer CG; University of Utah*	Net-unidirectional airflow patterns vary with pulmonary anatomy in monitor lizards (*Varanidae*): insights from a multi-species computational fluid dynamics investigation
2:15 pm	**28-4**	*Hossain M, Staples A; Virginia Tech*	Passive Vortical Flows Compensate for Low Flow Speeds in the Interior of a Coral Colony
2:30 pm	**28-5**	*Gaddam MG, Santhanakrishnan A; Oklahoma State University*	Squishy suction pumps: pore water release by upside-down jellyfish
2:45 pm	**28-7**	*Ahmed S, Shearer B, O'Brien H; Northeastern State University, NYU School of Medicine, OSU Center for Health Sciences*	The Hemodynamics Of The Carotid Rete In The Brown Greater Galago, *Otolemur crassicaudatus*
3:00 pm	**28-8**	*Kornev K, Aprelev P, Brasovs A, Adler P, Beard E; Clemson University*	Probing viscosity of insect blood at different spatial and time scales

3:15 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:30 PM **Session 29** **Lone Star H**

Biological Mousetraps: Springs and Latches

Chairs: Sarah Longo, Jeffrey Olberding

1:30 pm	**29-1**	*Olberding JP, Ilton M, Crosby AJ, Azizi E; University of California, Harvey Mudd College, University of Massachusetts*	Limits and Losses: the Power of Recoiling Biological Springs
1:45 pm	**29-2**	*Longo SJ, Cox SM, Azizi E, Ilton M, Olberding JP, St. Pierre R, Patek SN; Duke University, Pennsylvania State University, UC Irvine, Harvey Mudd College, Carnegie Mellon University*	Beyond power amplification: new insights from latch-mediated spring actuation (LaMSA)
2:00 pm	**29-3**	*Stinson Easterling CM, Seis C, Deban SM; Northwest University, University of South Florida*	Evidence of power amplification and thermal robustness in salamandrid feeding mechanisms
2:15 pm	**29-4**	*Mendoza E, Olberding JP, Azizi E; University of California, Irvine*	Temperature dependence of elastic recoil mediated by a mechanical advantage latch
2:30 pm	**29-5**	*Bolmin O, Alleyne M, Wissa AA; University of Illinois at Urbana-Champaign*	How does Morphology Affect Jumping Kinematics of Click Beetles?
2:45 pm	**29-6**	*Gibson JC, Suarez AV; University of Illinois at Urbana-Champaign*	Functional morphology and biomechanics of trap-jaw ants in the *Daceton* genus group
3:00 pm	**29-7**	*Acharya R, Challita EJ, Bhamla MS; Georgia Institute of Technology*	Ultrafast Finger Snap is Mediated by a Frictional Skin Latch
3:15 pm	**29-8**	*Jan I, Sangha G, Schulz JR; Occidental College*	The Cone Snail Strikes Back: A Biomechanical Study of an Ultrafast Prey Capture

3:30 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:15 PM **Session 30** **Rooms 301-302**

Flying and Swimming Behaviour

Chair: Matthew Lefauve

1:30 pm	**30-1**	*Lefauve MK, Hernandez LP; George Washington University*	Invasive Behavioral Syndrome in Cypriniform Fishes
1:45 pm	**30-2**	*O'Mara MT, Amorim F, Scacco M, McCracken GF, Safi K, Mata V, Tomé R, Swartz SM*, Wikelski M, Beja P, Rebelo H, Dechmann DKN; Southeastern Louisiana University, University of Porto, University of Konstanz, University of Tennessee, University of Lisbon, Brown University DKN*	European Free-tailed Bats Use Wind Regimes to Fly High and Fast
2:00 pm	**30-3**	*Burnett NP, Badger MA, Combes SA; University of California, Davis*	Wind and canopy height affect honey bee flight performance in cluttered environments
2:15 pm	**30-4**	*Tidswell BK, Tytell ED; Tufts University*	Using physical models to examine sensory coordination during fish schooling
2:30 pm	**30-5**	*Katija K, Govindarajan A, Llopiz J, Wiebe P, Breier J, Hobson B, Risi M, Robison B, Rock S, Yoerger D; Monterey Bay Aquarium Research Institution, Woods Hole Oceanographic Institution, Stanford University*	Mesobot: Toward autonomous observations of organismal behavior in the ocean's midwaters
2:45 pm	**30-6**	*White CF, Whitney NM, Weber DN, Frazier BS; Harvard University, New England Aquarium, Texas A&M, Department of Natural Resources*	Survival and Swimming Behavior of Red Drum (*Sciaenops ocellatus*) Following Recreational Capture and Release
3:00 pm	**30-7**	*Khursigara AJ, Esbaugh AJ; University of Texas at Austin*	Does crude oil exposure alter behavior in fish?

3:15 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:00 PM **Session 31** **Rooms 303-304**

Connubiality, Conjugality, or Civil Union? Symbiotic Relationships, Part II

Chair: Hanny Rivera

1:30 pm	**31-2**	*Fifer JE, Bui V, Berg J, Gabriel M, Bentlage B, Davies S; Boston University, University of Guam*	Coral Microbial Community Shifts Along a Steep Environmental Gradient
1:45 pm	**31-3**	*Rivera HE, Davies SW; Boston University*	What does it take to stay together? Uncovering symbiosis gene networks in a facultatively symbiotic coral
2:00 pm	**31-4**	*Howe-Kerr LI, Bachelot B, Wright RM, Kenkel C, Bay LK, Correa AMS; Rice University, Smith College, University of Southern California, Australian Institute of Marine Science*	Symbiont diversity correlates with variability in holobiont stress tolerance
2:15 pm	**31-5**	*Bedwell H, Abbott E, Balogh A, Kolodziej G, Hejmadi P, Diaz L, Huynh K, Ma J, Matz MV, Kenkel C; University of Texas at Austin, NOAA, University of Southern California*	Hurricane-driven asexual reproduction in massive boulder corals in the Florida Keys
2:30 pm	**31-6**	*Cassavaugh CM, Szuch CP, Kephart MK, Sevigny JL, Simpson S, Lamont S, Carfagno A, Bishop BM, Gillevet PM, Thomas WK, Cook GM*; New England College, University of New Hampshire, George Mason University*	Bioprospecting for Novel Antimicrobial Peptides in Corals and their Associated Microbiome
2:45 pm	**31-7**	*Barfield SJ, Davies SW, Matz MV; University of Texas, Austin, Boston University*	Co-recruitment of Relatives Leads to Emergence of Inbred Genetically Isolated Group within a Panmictic Population of a Broadcast-spawning Reef-Building Coral

3:00 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:30 PM **Session 32** **Room 205**

(Eco)Energetics

Chairs: Rebecca Clark, Hugh Ellis

1:30 pm	**32-1**	*John JS, Thometz NM, Boerner K, Denum L, Kendall T, Richter BP, Gaspard JC, Williams TM; University of California Santa Cruz, San Francisco University, Mote Marine Laboratory & Aquarium, Pittsburgh Zoo, PPG Aquarium*	Energetics of swimming in tropical marine mammals-Examining metabolic tradeoffs in West Indian manatees and Hawaiian monk seals
1:45 pm	**32-2**	*Dolan JE, Musial NA, Hammond KA; UC, Riverside*	Energy expenditure of cage activity versus wheel running in deer mice
2:00 pm	**32-3**	*Clark RM, Fox TP, Harrison JF, Fewell JH; Siena College, Arizona State University*	Energetic Savings of Grouping During Nest Initiation in Harvester Ants
2:15 pm	**32-4**	*Prinzing TS, Bigman BS, Skelton Z, Wegner NC, Dulvy NK; Simon Fraser University, Scripps Institution of Oceanography, NOAA Southwest Fisheries Science Center*	Paired Estimates of Metabolic Rate and Gill Surface Area in the Horn Shark (*Heterodontus francisci*)
2:30 pm	**32-5**	*Oliver KD, Martin TE, Wolf BO; University of New Mexico, University of Montana*	Air Temperature Limits Metabolic Scope in Mid-elevation Tropical Birds
2:45 pm	**32-6**	*Ellis HI, San Francisco S; University of San Diego, Texas Tech University*	Sustained Metabolic Scope: Verification from Eared Grebe Time and Energy Budgets
3:00 pm	**32-7**	*Goodchild CG, Durant SE; Oklahoma State University, University of Arkansas*	Is a novel marker of oxidative damage linked to aerobic scope and flying performance in birds exposed to crude oil?
3:15 pm	**32-8**	*Kunkel EL, Dale AS, Fuller NW, McGuire LP; Texas Tech University*	Partial Migration in Mexican free-tailed Bats: Ecology and Bioenergetics of Winter Residents

3:30 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:15 PM **Session 33** **Rooms 201-202**

Plasticity

Chairs: David Coughlin, Javier Mendez Narvaez

1:30 pm	**33-1**	*Mendez-Narvaez J, Warkentin K; Boston University, Smithsonian Tropical Research Institute*	Nitrogen Excretion Plasticity and Reproductive Colonization of Land by Frogs: Multiple Strategies to Avoid Ammonia Toxicity
1:45 pm	**33-2**	*Foster SA, Baker JA; Clark University*	Plasticity and the Origin of Evolutionary Pattern
2:00 pm	**33-3**	*Rosso AA, Logan ML, McMillan WO, Cox CL; Georgia Southern University, University of Nevada Reno, Smithsonian Tropical Research Institute, Florida International University*	Phenotypic Plasticity and the Response to Increasing Temperatures in a Tropical Lowland Lizard
2:15 pm	**33-4**	*Coughlin DJ; Widener University*	Thermal Acclimation Studies in Cold-Water Fishes: Do They Reveal the Potential Impact of Climate Change?
2:30 pm	**33-5**	*Helms Cahan S, Frietze SE, Gerrard DL, Bora K, Kaplan I, Perez M, Lockwood BL, Teets NM, Waters JK, Axen HJ; University of Vermont, LeTourneau University, University of Kentucky, Providence College, Salve Regina University*	Developmental temperature alters brain gene expression in adult *Drosophila melanogaster*
2:45 pm	**33-6**	*Esbaugh AJ, Lonthair J; University of Texas at Austin*	The Development of Acid-base Pathways in Marine Fish: Implications for Ocean Acidification
3:00 pm	**33-7**	*Dijkstra PD, Fialkowski RJ, Janeski HM, Aufdemberge PM; Central Michigan University*	Sexual Selection Favors Phenotypic Plasticity in Body Coloration in a Polymorphic Cichlid Fish

3:15 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:30 PM **Session 34** **Rooms 402-403**

Comparative Genomics and Phylogenetics of the Spineless

Chair:

1:30 pm	**34-1**	*Spagna JC, Espinosa AJ, Crews SC; William Paterson University, California Academy of Sciences*	Grass Spiders of North America and Europe: A Long-Distance Relationship Lasting 50 Million Years
1:45 pm	**34-2**	*Yap-Chiongco MK, Varney RM, Kocot KM; University of Alabama, Alabama Museum of Natural History*	What the Shell-less Aplacophorans Can Tell us About Molluscan Biomineralization
2:00 pm	**34-3**	*Kocot KM; University of Alabama*	Revolutionizing Biodiversity and Systematics Research on Aplacophora (Mollusca) and Training the Next Generation of Invertebrate Systematists
2:15 pm	**34-4**	*Cannon JT, Kocot KM, Varney RM, Eernisse DJ, Speiser DI, Oakley TH; UC Santa Barbara, University of Alabama, Cal State Fullerton, University of South Carolina*	Target-capture phylogenomics of Polyplacophora and the origins of shell eyes
2:30 pm	**34-5**	*Ballou L, Iliffe T, Olesen J, Bracken-Grissom HD; Texas AM University at Galveston, University of Copenhagen, Florida International University*	Molecular Phylogeny of Remipedia: Providing Preliminary Insights into the Evolution of Feeding across an Enigmatic Crustacean Group
2:45 pm	**34-6**	*Ontano AZ, Benavides L, Harvey M, Giribet G, Sharma PP; University of Wisconsin, Harvard University, Western Australian Museum*	Disentangling Arachnid Systematics Through Rare Genomic Events
3:00 pm	**34-7**	*Kitchen SA, Brückner A, Kishi Y, Miller DR, Naragon T, Wagner J, Parker J; California Institute of Technology*	Genomic insights into gland development of rove beetles
3:15 pm	**34-8**	*Ballesteros JA, Aharon S, Gainett G, Zern J, Zehms PP, Gavish-Regev E, Sharma PP; University of Wisconsin-Madison, Hebrew University of Jerusalem*	An Integrative Investigation Of Eye Loss In Levantine Arachnids

3:30 pm **Coffee Break** **Grand Ballroom**

7:00 PM – 8:00 PM **BART Lecture** *Sponsored by Sable Systems* **Salons D-E**

BART Lecture	*Stoddard MC; Princeton University*	Diversity of Form and Function in the Colorful World of Birds

Saturday POSTER SESSION P1

Grand Ballroom, 3:30-5:30 PM

Poster Set Up: 7:00-8:00 am; Poster Teardown: 5:30-6:00 pm

Even # - Authors present from 3:30-4:30 pm; Odd # - Authors present from 4:30-5:30 pm

Evodevo

P1-1	*Chavarria R, Smith FW; University of North Florida*	The loss of several Wnt genes is correlated with the loss of posterior growth in Tardigrada
P1-2	*Austiff JK; Harvard University*	Development of the Stomach of the Carnivorous Tadpoles of the Budgett's Frog, *Lepidobatrachus laevis* Compared to Filter Feeding Tadpoles
P1-3	*Silva MAP, Nakanishi N; University of Arkansas*	Assessing the Function of the POU-Domain Transcription Factor Pit-1 During Development of the Cnidarian *Nematostella vectensis*
P1-4	*Neal S, Daly CMS, Koenig KM; Harvard University*	Differentiation and Notch signaling in the Cephalopod Retina
P1-5	*Larocca-Stravalle Z, Kauffman J, Gillen K*; Kenyon College*	Labial A and Post-1 Hox Gene Expression in *Lumbriculus variegatus*
P1-6	*Rojas AM, Smith FW; University of Connecticut, University of North Florida*	A Secondarily Simplified Mechanism Patterns the Tardigrade Through-Gut
P1-7	*Phelps AN, Luc HM, Gross JB; University of Cincinnati*	Comparative developmental expression of neural crest genes in the blind Mexican cavefish, *Astyanax mexicanus*
P1-8	*Romano L, Broady C, Ji K, Madar M, Scoggins N, Wong M; Denison University*	Comparative analysis of developmental mechanisms and their plasticity with regard to changes in the environment: derived species versus the pencil urchin, *Eucidaris tribuloides*.
P1-9	*Dao TK, Lambert JD; University of Rochester*	The possible roles of retinoic acid pathway in the shell and the embryonic development of the mollusc *Tritia*.
P1-10	*Whitesel CA, Barone V, Lyons DC; UC San Diego*	Studying Neuroanatomy in *B. Stephanieae* through Immunohistochemistry
P1-11	*Gavazzi LM, Cooper LN, Thewissen JGM; Kent State University, Northeast Ohio Medical University*	Patterning and development of the beluga whale (*Delphinapterus leucas*) fluke
P1-12	*Daniel L, Dubansky B, Burggren W; University of North Texas*	Differences in Early Embryo Cleavage Rate in Two Populations of Killifish (*Fundulus grandis*)
P1-13	*Luc HM, Berning DJ, Adams H, Gross JB; University of Cincinnati*	Expression Analysis of In-Frame Indel Mutations in *Astyanax* Cave- and Surface-Dwelling Fish
P1-14	*Breen CM, Funk EC, McCune AR; Cornell University*	Role of *Bmp*s in Evolution of Gas Bladder in Ray-Finned Fishes
P1-15	*Arnaoudoff LA, Sanger TC; Loyola University*	Three-Dimensional Embryological Atlas of Anolis sagrei based on micro-CT.
P1-16	*Cumming M, Smith FW; University of North Florida*	Genomic and developmental origins of tardigrade legs
P1-17	*Hogan AVC, Balanoff AM, Bever GS; Johns Hopkins School of Medicine*	Developmental and Evolutionary Scaling in the Olfactory System of Birds
P1-18	*Luo YJ, Ricci L, Hulett RE, Srivastava M; Harvard University*	Single-cell profiling of acoel stem cell dynamics during development and regeneration

DEE BSP: Huey Award

P1-19	*Frãs Vellón AI, Krantz J, Macrander J; Florida Southern College*	The Impact of Microplastics on Sea Anemone Behavior, Survivorship, and Gene Expression
P1-20	*Villafranca N, Weglarz M, Hamlyn S, Vaughan D, Stenesen DS, Soper DM; University of Dallas, University of Dallas, Mote Marine Laboratory, Plant A Million Corals, University of Dallas, University of Dallas*	Investigation of Coral Growth and The Genetic Expression of The Hippo Growth Signaling Pathway in *Orbicella faveolata*
P1-21	*Giancarli SM, Dunham AE, O'Connor MP; Drexel University, University of Pennsylvania*	Examining Metabolic Allometry Among Birds: A Phylogenetic Approach

P1-22 *Miller-Crews I, Matz MV, Hofmann HA; University of Texas at Austin* — 2bRAD-seq Paternity Testing Pipeline for Complex and Mixed DNA Samples

P1-23 *Cordova KC, Farr D, Dethier MN, Dobkowski KA; California Polytechnic State University, University of Southern California, Friday Harbor Laboratories, University of Washington, Bates College* — Mismatched: Do Northern Kelp crabs (*Pugettia producta*) eat where they live?

Cladistics and Phylogenetics

P1-24 *Hamilton N, Rodriguez E, Izumi T, Yap N, Daly M; Texas A&M University, American Museum of Natural History, University of Tokyo, National University of Singapore, Ohio State University* — Phylogenetic relationships among burrowing sea anemones in the family Haloclavidae (Cnidaria: Anthozoa: Actiniaria)

P1-25 *Oyekwe OL, Waits DS, Halanych KM; Auburn University* — LTR retrotransposons in the non-model marine invertebrate Lamellibrachia luymesi (Annelida)

P1-26 *Spillane JL, Lapolice TM, MacManes MD, Plachetzki DC; University of New Hampshire* — Transcriptome assembly quality affects phylogenomic inference

P1-27 *Schneider SQ, Bastin BR, Ho S; Academia Sinica, Iowa State University* — Unique Tektin Gene Complements Support the Position of Xenacoelomorpha at the Base of Bilaterians, and the Inclusion of Chaetognaths within a Spiralian Clade

P1-28 *Morisawa R, Derkarabetian S, Boyer SL; Macalester College, Harvard University* — Phylogeny of the New Zealand harvestman genus *Rakaia* (Arachnida, Opiliones, Cyphophthalmi, Pettalidae) based on Ultra-Conserved Elements, with a description of new species

P1-29 *Kyle OM, Gibb AC, Minicozzi MR, Braga A; Northern Arizona University* — Can Air Breathing Ability in Teleost Fishes be Used to Predict Terrestrial Behavior?

P1-30 *Ghione C, Lough-Stevens M, Dean M; University of Southern California* — Male body size evolves more rapidly than female body size

Population Genetics

P1-31 *Harper FM, Clarke DG; Rollins College* — Very low genetic diversity in two species of North Atlantic sea stars

P1-32 *Redak C, Williams AS, Halanych KM, Whelan NV; Auburn University, United States Fish and Wildlife Service* — Effects of reservoirs on genetic diversity and gene flow of an endangered freshwater snail, *Pleurocera foremani*

P1-33 *Wright AD, Williams AS, Garrison NL, Whelan NV; Tuskegee University, Auburn University* — Population Genetics of the Critically Imperiled Oblong Rocksnail *Leptoxis compacta*

P1-34 *Tardelli Canedo P, Baker CM, Morisawa R, Pessereau EJ, Boyer SL; Macalester College, Harvard University* — Phylogeography of *Neopurcellia salmoni*, a widespread mite harvestman from the South Island of New Zealand, with the first report of male polymorphism in the suborder Cyphophthalmi

P1-35 *Corder KR, Schweizer RM, Cheviron ZA; University of Montana* — The Role of Mitonuclear Coevolution in High Altitude Adaptation

Evolutionary Ecology and Physiology

P1-36 *Fargevieille A, Cox RM, Delaney DM, Hall JM, Kahrl AF, Mitchell TS, Pearson PR, Reedy AM, Warner DA; Auburn University, University of Virginia* — Phenotypic variation of invasive lizard populations following experimental introduction on small islands

P1-37 *Casement B, Cox C, McMillan O, Logan M; Heidelberg University, Georgia Southern, Smithsonian Tropical Research Institute, University of Nevada* — The effects of abiotic conditions on activity time in tropical forest lizards, a large-scale field experiment in the Panama Canal

P1-38 *Ammen SC, Davis JE; Radford University* — From Killer Hornet Saliva to Mutated Super Flies: Investigating the Effect of Vespa Amino Acid Mixture (VAAM) on Energetics, Longevity, and Fitness

P1-39 *Graham ZG, Paloro AV, Vargas C, Angilletta MJ; Arizona State University, Universidade Federal de Sao Paulo* — The Offense and Defense of a Regenerated Weapon

P1-40 *Diorio RD, Howey CAF; University of Scranton* — The Persistence of Resistance to Timber Rattlesnake Venom in Small Mammals

P1-41 *Faria S; University of São Paulo, Bermuda Institute of Ocean Sciences, University of California Riverside* — Learning Evolution from Crustacean Physiology: a Phylogenetic Perspective on Habitat Diversification

P1-43 *Peterson CR, Bolnick DI; University of Texas at Austin, University of Connecticut* — Phenotypic Variation in Invasion and Community Assembly

P1-44 *Robertson CM, Giakas JA, Styga JM, Fortunato JA, Earley RL; University of Alabama, Centre College*
Phenotypic and Genetic Correlations between Life History Traits in a Self-Fertilizing Hermaphroditic Fish

P1-45 *Huebner CD, Treidel LA, Roberts KT, Williams CM; UC Berkeley*
Effects of Life History and Starvation on Temperature Preference of a Wing-Dimorphic Cricket, *Gryllus lineaticeps*

P1-46 *Hall KC, Kolmann MA, Wilson GP, Hundt PJ; University of Washington, George Washington University, University of Minnesota*
Chimaeras, sharks, skates and rays, oh my! Ecological structuring and evolutionary life-history traits of Chondrichthyes

P1-47 *Miladin JR, Steven JC, Collar DC; Christopher Newport University*
Abiotic ecological niche parameters are associated with leaf and flower size in *Silene*

P1-48 *Woodman TE, Emberts Z, Miller CW; University of Florida*
A high quality diet leads to improved puncture resistance of a weapon in the leaf-footed cactus bug (*Narnia femorata*)

P1-49 *Guzman A, Kolonin A, Aspbury A, Gabor C; Texas State University*
Land Use Conversion Affects Stress Physiology and Life-History of Western Mosquitofish

P1-50 *Wilson EJ, Delich C, Tobler M, Lee STM, Zeglin LH; Kansas State University*
Host-Microbiome Associations in Livebearing Fishes Adapted to Sulfidic Environments

P1-51 *Tran HN, Lower SE; Bucknell University*
Using computational approach to identify candidate odorant receptor genes in the most common firefly species in North America, *Photinus pyralis*

P1-52 *Gerringer ME, Yancey PH, Tikhonova OV, Vavvlov NE, Zgoda VG, Davydov DR; State University of New York at Geneseo, Whitman College, Institute of Biomedical Chemistry, Washington State University*
Evolving pressure tolerance in enzymes of abyssal and hadal fishes

Evolutionary Paleobiology

P1-53 *Moroz MJ, Kemp ME; University of Texas at Austin*
Fossil bats' (*Myotis velifer*) jaw morphology changes through time and with climate change in Hall's Cave, Texas

P1-54 *Hoffman DK, Uyeda JC, Nesbitt SJ; Virginia Tech*
Variable Evolutionary Rates in the Morphology of the Extinct Clade Aetosauria (Reptilia: Archosauria)

P1-55 *Tsai HP, Griffin C; Missouri State University, Virginia Tech*
The cartilaginous hips of Diplodocoidea: functional implications for highly specialized locomotor behaviors among sauropods

P1-56 *Abbott CP, Lockwood R, Sues HD, Hunt G, Angielczyk KD; University of Chicago, William & Mary, Smithsonian Institution, Field Museum*
How useful are extant tetrapods as analogues for non-mammalian synapsid posture?

P1-57 *Scott BR, Anderson PSL; University of Illinois Urbana-Champaign*
Possible niche overlap based on similarities in body form among early jawed and jawless vertebrates

P1-58 *Orcutt JD, Ritchey TE, Vietri CB; Gonzaga University*
Otospermophilus mckayensis and the Evolution of Burrowing in Oligo-Miocene Squirrels

Adaptation and Sexual Selection

P1-59 *Matz MV; University of Texas at Austin*
LD networks, a new approach to detect sites under polygenic selection, applied to characterize patterns of introgression among coral ecomorphs.

P1-60 *Dunn PO, Henschen A, Whittingham LA; University of Wisconsin-Milwaukee, University of Memphis*
Gene Expression and Reliable Signaling in a Plumage Ornament

P1-61 *Wittman TN, Cox RM; University of Virginia*
Experimental evidence that parasites alter patterns of phenotypic selection in a wild lizard population

P1-62 *Kelly AP, Maddux SD; UNT Health Science Center*
The interaction of climatic and energetic factors on human nasal morphology

P1-63 *Lundeen IK, Bertrand OC, Silcox MT; University of Texas at Austin, University of Edinburgh, University of Toronto Scarborough*
Ecogeographic variation and phylogenetic signature in rodent respiratory turbinates

P1-64 *Bhave RS, Reedy AM, Wittman T, Cox RM; University of Virginia*
Copulatory transfer of fluorescent powder suggests sexual selection for larger males in a wild lizard population

P1-65 *Ramos-Guivas B, Jawor J, Wright TF; New Mexico State University*
Glucocorticoids and reproductive success in captive Puerto Rican Parrot *Amazona vittata*

P1-66	*Tosto NM, Rose E, Masonjones HD; University of Tampa*	Quantifying Sexually Selected Traits in the Female Gulf Pipefish (*Syngnathus scovelli*)
P1-67	*Robles KD, Lin C, Osborn K; Brown University, Smithsonian Institution*	Visualizing Deep-Sea Eye Adaptations Using Micro-CT 3D Reconstructions
P1-68	*Comerford MS, Carroll SP, Egan SP; Rice University, University of California Davis*	Spatial sorting drives rapid ecological adaptation of the soapberry bug
P1-69	*Axen HJ, Taft C, Wilson-Wuestefeld A, Depelligrini F, Clifford M; Salve Regina University*	Assessing Physiological Plasticity in the Face of Climate Change in Natural and Lab Reared Drosophila Species Collected Across Elevational Gradients
P1-70	*Gams HC, Yerga KM, Young VKH; Saint Mary's College*	Rodents of unusual size? Fox squirrel (*Sciurus niger*) body mass at Saint Mary's College
P1-71	*Yerga KM, Gams HC, Young VKH; Saint Mary's College*	Body mass in female and male fox squirrels (*Sciurus niger*) at Saint Mary's College
P1-72	*Barts N, Nieves N, Trojahn S, Kelley J, Tobler M; Kansas State University, Washington State University*	Exaptation as a possible mechanism facilitating invasion of extreme environments
P1-73	*Larson TR, Jacobs JL, Smith EN; University of Texas at Arlington*	Sexual dimorphism in the fanged-frog genus *Limnonectes* (Anura: Dicroglossidae): skull differences between males and females

Parental Care and Reproduction

P1-74	*Westrick SE, Van Kesteren F, Boutin S, Lane JE, McAdam AG, Dantzer B; University of Michigan, University of Alberta, University of Saskatchewan, University of Guelph*	Behavioral and Physiological Effects of Variation in Maternal Care and Glucocorticoids
P1-75	*Gogel CA, Mullin SM, Leese JM; DeSales University*	Environmental factors influence sex roles and nest site selection in cichlids
P1-76	*Van Breukelen NA, Santangelo N*; Salem Community College, Hofstra University*	Aggression by convict cichlid pairs as a means to deter brood mixing in a natural setting
P1-79	*Brandt EE, Rosenthal MF, Elias DO; University of Western Ontario, University of California Berkeley*	Temperature Effects on Multimodal Sexual Signals in an Ectotherm: a Network Analytical Approach
P1-80	*Fernandez Y, Dowdy N, Conner W; Wake Forest University*	Acoustic Communication in *Bertholdia trigona* (Lepidoptera: Arctiinae): High Duty Cycles Promote Survival and Mating
P1-81	*Musgrove CM, Watson LAR, Hinds AD, Carvalho CM, Ambardar M; Fort Hays State University*	Relationships among Parental Care, Heterophil to Lymphocyte Ratio, and Reproductive Success in a Songbird
P1-82	*Riley AK, Grindstaff JL; Oklahoma State University*	Paternal removal leads to changes in learning ability and sociality in zebra finch (*Taeniopygia guttata*) offspring
P1-83	*Miller NA, Foltz SL; Radford University*	Correlating nest defense behaviors in eastern bluebirds (Sialia sialis) and tree swallows (Tachycineta bicolor) with features of the nesting site and nest stage.
P1-84	*Viernes RC, Farrar VS, Austin S, Feustel T, Flores L, Asmai R, Arias JG, Calisi RM; University of California Davis*	Ex-spleen-ing Trade-offs Between Immunity and Reproduction during Parental Care in the Rock Dove, *Columba livia*
P1-85	*Utt DJ, Foltz SL; Radford University*	The Effects of Light Pollution on Nesting Behavior in Eastern Bluebirds and Tree Swallows
P1-86	*Holloway F, De Bruijn R, Khoshaba E, Lopes PC; Chapman Univ*	Neurogenomic Changes During the Transition to Parental Care in Virgin Japanese Quail
P1-87	*Sam A, Malcangi S, Lam C, León C, Ramírez-Estrada J, Bauer C; Adelphi University, Pontificia Universidad Católica de Chile*	Postnatal maternal stress decreases locomotive play behaviors in *Octodon degus* pups

Sensory Biology

P1-88	*Congdon ER, Evans MB; Bethune-Cookman University, TheraPet Inc*	Using Therapeutic Play to Alleviate Stress in Shelter Dogs
P1-89	*Kamska V, Daley M, Badri-Sprowitz A; Max Planck Institute for Intelligent, University of California Irvine*	Potential for elastic soft tissue deformation and mechanosensory function within the lumbosacral spinal canal of birds
P1-90	*Henderson KW, Roche AS, Hale ME; University of Chicago*	Hindbrain and spinal cord sensory neuron innervate of the pectoral fin

P1-91	*Venuto A, Crowe S, Nicolson T, Erickson T; East Carolina University, Stanford School of Medicine*	Life without a lateral line: A new genetic model to study lateral line-mediated behaviors in zebrafish.
P1-92	*Yeh SY, Meade ME, Roginsky JE, Schulz JR; Occidental College*	Primary Cell Culture of Adult Zebrafish Spinal Neurons for Electrophysiological Studies
P1-93	*Bagge LE, Goldstein DH, Lyons BA, Wehling MF; Air Force Research Lab, University of Florida*	Circularly Polarized Light Reflectance of and Wing Interference Patterns from Insects
P1-94	*Martins L, Lower S; Bucknell University*	Dark Firefly Seduction: Identifying the Mate Attracting Mechanism of *Ellychnia corrusca* via Bioinformatics
P1-95	*Harris OK, Morehouse NI; University of Cincinnati*	Predator-mimicking sensory exploitation in the courtship display of *Maratus* jumping spiders.
P1-96	*Long HE, Foltz SL, Davis JE, Samuels T; Radford University*	ScaryFeeder: Gauging Behavioral Responses When Introduced to Potentially Threatening Stimuli in Wild Songbirds
P1-97	*Kane SA, Wang Y*, Fang R, Lu Y, Dakin R; Haverford College, Carleton University*	How conspicuous are peacock eyespots and other colorful feathers in the eyes of mammalian predators?
P1-98	*Currea JP, Frazer R, Theobald JC, Wasserman S; Florida International University, Wellesley College*	Using Microscope or MicroCT Images to Measure Compound Eye Optics
P1-99	*Dang A, Bernard GD, Olguin AR, Macias-Muñoz A, Lawrence JP, Hill RI, Mullen SP, Briscoe AD; University of California Irvine, University of Washington, Universidad Nacional Autónoma de México, University of the Pacific, Boston University*	Color Vision in Nymphalid Butterfly, *Adelpha fessonia*
P1-100	*Lucia RL, Kingston ACN, Speiser DI; University of South Carolina*	The Impact of the Orbital Hood on Spatial Vision in the Snapping Shrimp *Alpheus heterochaelis*
P1-101	*Serba KM, Fasick JI, Algrain H, Robinson PR; University of Tampa, University of Maryland Baltimore County*	The Retinal Pigments of Filter-feeding Sharks and their Role in Visual Foraging Ecology
P1-102	*Sharkey CR, Leibowitz M, Pinto Benito D, Wardill TJ; University of Minnesota, Cambridge University, Autonomous University of Madrid*	*In vivo* spectral sensitivity of *Drosophila* photoreceptors
P1-103	*Walkowski WG, Santana A, Leslie CE, Gordon WC, Bazan NG, Farris HF; LSUHSC, UT Austin*	Endocrine Control of Retinal Sensitivity in *Hyla cinerea*
P1-104	*Padilla GM, Woods CE, Todd KL; Westminster College*	Electrophysiological Responses of *Hirudo verbana* to Different Intensities of Ultraviolet Radiation
P1-105	*Solie SE, Johnsen S; Duke University*	Contrast Sensitivity and Spatial Resolution in the Trinidadian Guppy (*Poecilia reticulata*)
P1-106	*McCulloch KJ, Koenig KM; Harvard University*	Regulatory logic of the retinal determination gene network in the starlet sea anemone, *Nematostella vectensis*
P1-107	*Notar JC, Johnsen S; Duke University*	Trends in Spatial Acuity Across the Sea Urchins
P1-108	*Taylor BK, Kehl C; University of North Carolina at Chapel Hill*	Bioinspired trans-equatorial navigation using sequential measurements of magnetic inclination
P1-109	*Taylor BK, Kehl C; University of North Carolina at Chapel Hill*	A bioinspired navigation strategy that uses magnetic signatures to navigate without GPS in the Northern Atlantic
P1-110	*Tsai E, Naisbett-Jones L, Lohmann C, Lohmann K; University of North Carolina at Chapel Hill*	Magnetic Map Sense of Gulf Flounder (*Paralichthys albigutta*)
P1-111	*Capshaw G, Soares D, Christensen-Dalsgaard J, Carr CE; University of Maryland, New Jersey Institute of Technology, University of Southern Denmark*	Acoustic reception in salamanders: Skull vibrations enable sound pressure detection
P1-112	*Luscavage E, Goldina A; Elizabethtown College*	Invasive crayfish *Orconectes rusticus* exhibit sexually dimorphic responses to conspecific pheromones
P1-113	*Kelley MD, Ka C, Mendonça MT*; Auburn University*	The Importance of Olfactory Cues from Male Chin Glands & Multimodal Signal Use in Gopher Tortoises *Gopherus polyphemus*
P1-114	*Casleton R, Morgenthaler M, Shaikh S, Sorge M, Tucker B, Essendrup I, Berman S, Peet MM, Aukes DM, He X, Marvi H, Fisher RE; Arizona State University, University of California Los Angeles, University of Arizona College of Medicine-Phoenix*	Chemoreception in Octopus bimaculoides

P1-115 *Adams AN, Wofford SJ; Jacksonville State University* — Using a complex chemical landscape to find an ideal habitat under predation threat

P1-116 *York JM, Zakon HH; University of Texas at Austin* — Identifying potential molecular thermosensors in Antarctic notothenioid fishes

Biodiversity: a new age of discovery

P1-121 *Danziger A, Frederich M; University of New England* — Design and use of species-specific *Carcinus maenas* eDNA primers to analyze shedding and degradation rates of eDNA

P1-122 *Kolker Ghatan M, Belmaker Y, Kiflawi M, Meiri S, Holzman R; Tel Aviv University, Ben-Gurion University* — Using a meta-barcoding method for studying population dynamics of larval invasive and native fishes in the Eastern Mediterranean

P1-123 *McCutcheon MM, Kocot KM; University of Alabama, Alabama Museum of Natural History* — Uncovering the Biodiversity of New Zealand Aplacophorans

P1-124 *Brady K, Kovacs J, Voisin D, Welch J; Spelman College* — Characterizing the gut microbiome of honeybees

P1-126 *Schwartz ML; University of Washington* — Nemertean Diversity in the Southern Ocean

P1-127 *Berlow M, Kohl KD, Derryberry EP; University of Tennessee Knoxville, University of Pittsburgh* — Can't Kill a Bird Twice: Evaluating Non-Lethal Sampling of Avian Gut Bacteria

Habitats and Ranges: Location Location Location

P1-128 *Dobkowski KA, Farr D; Bates College, University of Southern California* — What regulates the growth of bull kelp (*Nereocystis luetkeana*) recruits: competition for light or for space?

P1-129 *Gilchrist SL; New College of Florida* — Shell and Other Object Use by Land Hermit Crabs: Increases in Use of Anthropomorphic Objects on Cayos, Cochinos, Honduras

P1-130 *Benedict C, Wood P, Grismer L, Oaks J; Auburn University, La Sierra University* — Phylogenetic Placement of Burmese Tree Frogs in the genus Polypedates (Gravenhorst, 1829)

P1-131 *Clay TA, Hess AJ, Bonett RM; Nicholls State University, University of Tulsa* — Biogeography of the Ouachita Dusky Salamander, *Desmognathus brimleyorum*

P1-132 *Moore CL, McDonnell AJ, Schuette S, Martine CT*; Bucknell University, Chicago Botanic Garden, Western Pennsylvania Conservancy* — Prairies in Pennsylvania?: Assessing the conservation status of *Baptisia australis* var. *australis* through natural history and metapopulation lenses.

P1-134 *Carlson TC, Cabrera-Guzmán EC, Fox SF; Oklahoma State University* — First Documentation of Breeding Aggregations of the Ringed Salamander, *Ambystoma annulatum*, in Oklahoma, USA

P1-134.5 *Evangelista D, Edwards C, Hall M, Martin W, Nemani S; US Naval Academy, United States Navy* — Thermal imaging of a sea turtle *arribada* using an Unmanned Aerial System (UAS)

Interspecific interactions

P1-135 *Profetto GM, Howard JJ; University of New Orleans* — Management of *P. montana*Effects on Plant Community Diversity

P1-137 *Jendrey CR, Turner M; University of Washington* — Star Gazing: Observations on the Movement and Feeding Behaviors of Ochre Sea Stars (*Pisaster ochraceus*)

P1-138 *Pimienta MC, Ruiz CA, Koptur S; Florida International University* — Do Diurnal Floral Visitors Increase the Fruit-set of a Sphingophilous Plant?: The Case of the Rough-leaf Velvetseed (Rubiaceae)

P1-140 *Cupp PV; Eastern Kentucky University* — Interspecific Cooperation of *Philomycus* Slugs and Green Salamanders, *Aneides aeneus*, May Enhance Water Economy

P1-141 *Hernandez AM, Wainwright DK, Farrell BD; Harvard University, Yale University* — Locomotion on a Leaf: Measuring the Microtopography of a Leaf Surface

P1-142 *Akkipeddi SMK, Xu M, Chan KYK; Swarthmore College* — Halogenated compound secreted by marine bacteria halts larval urchin development

P1-143 *Walters LJ, Phlips EJ, Badylak S, McClenahan G, Sacks PE, Donnelly MJ; University of Central Florida, University of Florida* — Recruitment and Survival of the Eastern Oyster *Crassostrea virginica* when Challenged by the Brown Tide *Aureoumbra lagunensis*: Field Results

P1-144 *Drummond JA, Brandao PB, Brandt ME, Egan SP, Correa AMS; Rice University, University of the Virgin Islands* — Environmental DNA captures shifts in Caribbean fish communities associated with the invasive seagrass *Halophila stipulacea*

P1-145	*Tapsak ST, Hranitz JM, Percival CR, Pulley KL, Gonzalez VH, Petanidou T, Tscheulin T, Kantsa A, Barthell JF; Bloomsburg University of Pennsylvania, Pomona College, University of Texas at El Paso, University of Kansas, University of the Aegean, University of Central Oklahoma*	Generalist Pollinators are the Foundation of a Summer Coastal Pollination Network in Dune Habitat.
P1-146	*Connor C, Zinn D, Williams DA, Watson CM; Midwestern State University, Texas Christian University*	Dietary Niche Overlap of Native and Invasive Anoles on Dominica
P1-147	*Leavitt HE, Adrienne C, Amanda NN, Ford M; Eckerd College, NOAA Office of Ocean Exploration and Research, NOAA Fisheries Marine Ecosystems Division*	Investigating Remotely Operated Vehicle Avoidance Behavior and Distribution of Mesopelagic Fauna
P1-148	*Orr TJ, Yamada KYH, Nelson MD, Matocq MD, Nielsen DP, Shaprio MD, Dearing MD; New Mexico State University, Auburn University, University of Utah, University of Nevada Reno*	Diet switching in mammalian herbivores: dietary specialization and toxin tolerance in two woodrat species
P1-149	*Armstrong R, Torres T, Watson CM, Shipley MM; Midwestern State University*	Characterization of Fatty Acid Profiles of the Butterfly Weed (*Asclepias tuberosa*) and its Specialist Predator, the Monarch Butterfly (*Danaus plexippus*).
P1-150	*Semanchik P, Bergey L, Labar J, Ritchie L, Horvath T; Centenary University*	Comparison of Parasite Occurrence Between Three Native and one Non-native Palaemon Species of Grass Shrimp

Animal Communication

P1-151	*Austin AA, Davis J, Foltz S; Radford University*	Frustrated Foragers: Can Displacement Behavior Communicate Food Quality and Accessibility Within and Between Species in the Wild?
P1-152	*Ludington SC, McKinney JE, O'Connell LA; Stanford University*	Role of Transcription Factor FOXP2 in Tadpole Social Communication
P1-152.5	*McKinney JE, Ludington S, O'Connell LA; Stanford University*	Nonapeptide Regulation of Begging and Aggressive Behavior in a Social Tadpole
P1-153	*Hellmich DL, Wright TF; New Mexico State University*	Mapping the Contact Call Variation of Urban Invasive Parrots as a Model for Understanding Vocal Dialect Formation.
P1-154	*Kane SA, Xia S*, Fang R, Lu Y, Ulzll-Orshikh N, Wu J, Dakin R; Haverford College, Carleton University*	Multispectral imaging reveals the design of iridescent visual signals in peacocks and related pheasants
P1-155	*Ruvina K, Bergman DA*, Wright MA; Grand Valley State University*	The Sniff of Victory: The Road to Identify an Aggressive Male Chemosignal in Crayfish
P1-156	*Slattery JD, Rodriguez IM, Bilotta AJ, Wacker DW; University of Washington Bothell*	Caw and Response: Context-Dependent Group Calling In American Crows
P1-157	*Hardt B, Benedict L; University of Northern Colorado*	Assessing the Influences of Habitat Structure on Bird Song Propagation
P1-158	*Hensley NM, Gerrish GA, Saha R, Oakley TH, Rivers TJ; University of California Santa Barbara, University of Wisconsin Madison, Bates College, University of Kansas*	Does ecological overlap drive the evolution of mating display discrimination in female sea fireflies?
P1-159	*Krieg CA, Getty T, Wade J; University of Scranton, Michigan State University, University of Connecticut*	Sex Differences in Morphology of the Song Control Circuit in House Wrens, a North Temperate Species with Female Song
P1-160	*Wiser SD, Markham MR; University of Oklahoma*	Electrosensory and metabolic responses of weakly electric fish to changing water conductivity
P1-161	*Dupin MK, Dahlin CR, Wright TF; New Mexico State University, University of Pittsburgh at Johnstown*	Assessment of Population Size and Dialect Presence in the Endangered Yellow-Naped Amazon, *Amazona auropalliata*
P1-162	*Williams MD, Moosavi SK, Hutchins CE, Roberto DP, Breen MK, Ahmed ZB, Sullivan TJ, Jabir AH, Kolonko KJ, Harbison CW*; Siena College*	Pheromone Communication and Aggregation Behavior in a Bird Ectoparasite
P1-163	*Smith C, Reichert M; Oklahoma State University*	Chemical Commuication and the effect of Calling Behavior in *Hyla chrysoscelis*
P1-164	*Hom KN, Terrazas M, Forlano PM; CUNY Graduate Center, St Mary's College, CUNY Brooklyn College*	Oyster toadfish calling in noisy NYC waters
P1-165	*Gomes Aversa MD, Hartley JG, Leese JM; DeSales University*	Female Mate Preference in Convict Cichlids Influenced by Intrasexual Competition and Male Quality

P1-166 *Coomes CM, Derryberry EP; University of Tennessee Knoxville* Some like it hot: Do female songbirds discriminate between songs produced under hot and cold temperatures?

P1-167 *Kironde E, Furlan F, Fuxjager MJ, Preininger D, Mangiamele L; Smith College, Université Paris Diderot, Brown University, Vienna Zoo* Androgens modulate dynamic changes in multimodal display structure in the Bornean rock frog (*Staurois parvus*)

P1-168 *Sung JY, Morehouse NI; University of Cincinnati* Selection for Distinctiveness in Chinese Opera Masks

Animal Movement

P1-169 *Hoover EL, Dickerson S, Beck H, Oufiero CE; Towson U* Modulation of takeoff kinematics in a nocturnal gliding mammal under varying photic environments.

P1-170 *Morrell A, Bartlam-Brooks H, Bennitt E, Wilson A; Royal Veterinary College, University of Botswana* Navigation of zebra between grazing grounds and distant water sources in Botswana, Africa

P1-171 *Jackson CP, Fischer EK, O'Connell LA; Stanford University* Behavioral Variation of Poison Frog Tadpoles in an Open Field

P1-172 *Vernasco BJ, Emmerson MG, Gilbert ER, Sewall KB, Watts HE; Washington State University, Virginia Tech* Migratory state and patterns of steroid hormone receptor expression in the pectoralis muscle of a nomadic migrant, the pine siskin (*Spinus pinus*)

P1-173 *Hall LM, Enriquez MS, Mensinger AF; University of Minnesota Duluth* The Effects of Intensive Trapping on the Population Dynamics of the Invasive Round Goby (*Neogobius melanostomus*)

P1-174 *Davis TJ, Wyneken J; Florida Atlantic University* Diving Behavior of Captive Reared Leatherback Turtles

P1-175 *Hahn TP, Dingle H, Ramenofsky M, Cussen VA, Cornelius JM; Univ of California Davis, Oregon State Univ* Strategies for use of unpredictable dynamic resources

P1-176 *Evangelista D, Figueroa S; United States Naval Academy* Biomechanics of Herndon Climb

P1-177 *Ahmadyar S, Tran T, Rivera AS; University of the Pacific* Serotonin induces female swimming behavior in sexually dimorphic ostracod crustaceans

DVM BSP: Karel F. Liem Award

P1-179 *Black CR, Armbruster JW; Auburn University* Shape Variation of Armored Catfishes in a Phylogenomic and Ecological Context Using 3D Geometric Morphometric Techniques (Loricariidae)

P1-180 *Wynd BM, Uyeda JC, Nesbitt SJ; Virginia Tech* Allometric growth and shifting diet in the large-bodied traversodontid cynodont, *Exaeretodon argentinus*, with implications for modeling growth in distorted specimens

DCB BSP: Steven Vogel Award

P1-181 *Galloway KA, Porter ME; Florida Atlantic University* Lionfish puncture performance is impacted by the target tissue type

P1-182 *Puffel F, Labonte D; Imperial College London* Scaling of bite forces in leaf-cutter ants

P1-183 *Attipoe AEL, Kaimaki DM, Labonte D; Imperial College London* Surface Tension of the Insect Pad Secretion

P1-184 *Quimby K, Crews SC, Spagna JC; William Paterson University* Impact of Leg Loss on Rotating Prey Strikes in "Flattie" Spiders of Genus *Karaops*

P1-185 *Salem W, Xu S, Mongeau JM; Pennsylvania State University* Kinematic control of the yaw optomotor response in *Drosophila* flight

P1-186 *Smith SK, Hakansson J, Frazel PW, Long MA, Elemans CPH, Phelps SM; University of Texas Austin, University of Southern Denmark, NYU Langone* An Intralaryngeal Whistle Using an Elaborated Structure Enables Song in Alston's Singing Mouse

Eco/evomorphology - Jaws and Skulls

P1-187 *Xiong D, Churchill M; University of Wisconsin* Prey Capture Strategy is Correlated with Temporalis Muscle Size in Toothed Whales (Odontoceti)

P1-188 *Gilbert MC, Lerose C, Conith A, Moyer JK, Huskey S, Albertson RC; Univ MA Amherst, Western KY Univ* Osteology and Myology of *Pterycombus petersii*, with Insights into the Functional Tradeoff Between Feeding and Locomotion

P1-189 *Fabre AC, Noirault E, Fernandez V, Portela-Miguez R, Goswami A; Natural History Museum* Morphological integration of the skull in marsupials: impact of diet and locomotion

P1-190 *Shelburne EC; Fort Hays State University* Something's Fishy: A Comparative Structural Analysis of the Feeding Morphology of the Fish *Xiphactinus audax* and *Megalops atlanticus* Using 2D and 3D Morphometrics

P1-191	*Gilbert MC, Lerose C, Conith A, Cox FC, Albertson RC; Univ MA Amherst, Instituto Nacional de Pesquisas da Amazônia*	Ontogeny of *Caquetaia spectabilis*: Delayed Skull Development Accommodates Extreme Jaw Protrusion
P1-192	*Griner JG, Diamond KM, Blob RW; Clemson Univ*	Comparative body shapes of amphidromous goby fishes living in different predator regimes
P1-193	*Tse A, Calede J; Ohio State University*	Quantifying the link between cranial morphology and diet in Soricidae using geometric morphometrics
P1-194	*Peredo CM, Marshall CD; University of Michigan, Texas A&M University*	Orientation of the orbit predicts feeding ecology in marine mammals
P1-195	*Hernandez CA, Heinicke M, Gamble T, Siler CD, Daza JD; University of Texas Arlington, Sam Houston State University, University of Michigan, Marquette University, University of Oklahoma*	Morphological Variation of Gliding Geckos and Other Closely Related Forms
P1-196	*Jones DD, Schmitz L,, Claremont McKenna, Scripps, and Pitzer Colleges*	Retinal Topography of Mudskippers and Related Gobiid Fishes
P1-197	*Hodge JR, Price SA, Wainwright PC; Clemson University, University of California Davis*	Ancestral effects on convergence in zooplanktivorous butterflyfishes
P1-198	*Hernandez AI, Scanlan LG, Cook W, Schmitz L,, Claremont McKenna, Scripps, and Pitzer College*	Visual Fields in Mudskippers and Related Gobiid Fishes
P1-199	*West JV, Lawing AM; Texas A&M University*	Grab the Lizard by the Horns: Morphological Patterns in Horned Lizard Skulls

Morphology and Mechanics - Skeletons and Teeth

P1-200	*Sekits NF, Tunnell Wilson WT, Jackson K; Whitman College*	The Striped Beaked Snake really is a Skaapsteker adapted for digging: Evidence from cranial morphology
P1-201	*Heerdegen I, Parker L, Ruddy B, Ingle D, Porter ME; Florida Atlantic University*	Interspecific and regional variation in shark vertebral mineral structure and content
P1-202	*Sullivan SP, Middleton KP, Holliday CM; University of Missouri*	Morphology and Function of the Avian Furcula
P1-203	*Skonieczny KL, D'Emic MD, Burk C, Hoffmann S; NYIT College of Osteopathic Medicine, Adelphi University, Northport High School*	Cementum Analysis for Age Estimation in Fossil Mammals: Micro-CT vs Histological Thin Sections
P1-204	*Crownover LA, Anderson CV; Univ South Dakota*	Diversification patterns and evolutionary drivers in the chameleon axial skeleton
P1-205	*Clark A, Caruso A, Gignac P, Uyeno T; College of Charleston, Oklahoma State University, Valdosta State University*	Three-dimensional reconstruction of the hagfish feeding apparatus using diceCT
P1-206	*Summers DA, Wainwright DK; Harvard University, Yale University*	Crushers: When Lanternfish Develop Modified Pharyngeal Jaws
P1-207	*Womble AL, Clark AJ, Uyeno TA; Valdosta State University, College of Charleston*	The Functional Morphology of the Hagfish Feeding Apparatus Dental Plate Complex
P1-209	*Newbrey MG, Woolfolk FR, Martín-Abad H, Maisey JG; Columbus State University, Universidad Autónoma de Madrid, American Museum of Natural History*	Chronological ages of the coelacanths *Latimeria chalumnae* and *Axelrodichthys araripensis* by comparing ages from scales and bones
P1-210	*Rehorek SJ, Elsey R, Beeching SC; Slippery Rock University, Louisiana Department of Wildlife and Fisheries*	*Morphometrics of the American Alligator (Alligator mississippiensis) Embryonic Head.*
P1-211	*Garcia PA, Deban SM, Jones MEH, Lappin AK; Univ South Florida, Natural History Museum, California Polytechnic Univ*	Effects of bite out-lever and gape angle on bite force in the brown anole (*Anolis sagrei*)
P1-212	*Berning DJ, Powers AK, Gross JB; University of Cincinnati, Harvard Medical School*	Convergent and Constructive Craniofacial Trait Evolution in Three Cave-Dwelling Populations of *Astyanax Mexicanus*
P1-214	*Baxter D, Farina SC, Fath MA, Tytell ED, Donatelli CM; Tufts University, Howard University, University of Ottawa*	Evolution of notochordal foramina in actinopterygian fishes
P1-215	*Goodvin DM, Rosenbach KL, Wilson JA; University of Michigan Ann Arbor*	A New Method of Measuring Air Space Proportion in Pneumatic Skeletal Tissue
P1-216	*Robishaw TE, Secor SM; University of Alabama*	Comparative Allometry and Contribution of Snake Skeletal Mass
P1-217	*Shea-Vantine CS, Kajiura SM, Porter ME, Galloway KA; Florida Atlantic University*	Puncture performance of the barbs from the Atlantic stingray, *Hypanus sabinus* and the Bluntnose stingray, *Hypanus say*

Feeding and Digestion

P1-218 *Menegaz R, Rossiter JA, Larocque H, Boley A, Kile R, Saavedra R; University of North Texas Health Science Center* — Diet-Related Plasticity in Rodent Masticatory Muscles

P1-219 *Li EY, Kaczmarek EB, Olsen AM, Weller HI, Camp AL, Brainerd EL; Brown University, University of Liverpool* — The Relationship Between Movement Coordination and Suction Power During Feeding in Royal Knifefish (*Chitala blanci*)

P1-220 *Chadwell BA, Olson RA*, Montuelle SJ, Williams SH; Idaho College of Osteopathic Medicine, Ohio University* — FeedCycle: Facilitating rapid post-processing of XROMM data from mammalian feeding experiments

P1-221 *Lammers AR, Gould FDH, Ding P, German RZ; Cleveland State University, Rowan University, John Hopkins University, Northeast Ohio Medical University* — Hyoid kinematics during swallowing: effects of different vagus nerve lesions in infant pigs

P1-222 *Edwards KM, Reznick DN; University of California, Riverside* — Feeding Performance Differences in High and Low Predation Guppies Raised with Different Food Presentations

P1-223 *Montuelle SJ, Tewksbury C, Wilkinson K, Olson R, Williams SH, Gerstner G; University of Michigan, Ohio University* — Variability in Mammalian Chewing using Functional Data Analysis: Differences in Jaw Pitch Amplitude and Velocity throughout the Chewing Cycle

P1-224 *Tewksbury C, Wilkinson K, Montuelle S, Gerstner G, Williams SH; University of Michigan, Ohio University* — Variability in mammalian chewing using functional data analysis: flexibility in jaw movements in response to food properties in pigs

P1-225 *Kehl CE, Neustadter DM, Chiel HJ; University of North Carolina at Chapel Hill, Cardiac Success Ltd, Case Western Reserve University* — A 3D Model for Validating Hypotheses in Feeding Behavior in *Aplysia californica*

P1-226 *Chennault M, Martinez C, Wainwright P; Howard Univeristy, University of California Davis* — Comparing Functional Traits in Feeding Morphologies of Hybrid Sunfish

P1-227 *Violoet E, Devine K, Kenaley CP; Boston College* — A Matter of Scales: Evaluating the Function of Fangs in Deep-sea Fishes

Complementary to S3: Biology at the Cusp: Teeth as a Model Phenotype for Integrating Developmental Genomics, Biomechanics, and Ecology

P1-228 *Gauthier SM, Cohen KE, Summers AP; Lewis and Clark College, University of Washington* — Getting to the Point: Characterizing the Function of Conical Teeth in Deep-Sea Stomiiformes

P1-229 *Bakari KI, Lomax JJ, Farina SC; Howard University, Brown University, University of Washington Friday Harbor Laboratories* — Relating Occlusal Offset to Diet in Piranhas and Pacus

P1-230 *Johanson Z, Underwood C, Twitchett R, Smith M; Natural History Museum, University of London, King's College* — Microstructure and Mineralogy in Dental Plates of *Harriotta raleaghae* (Holocephali): Novel Dentine and Conserved Patterning Combine to Create a Unique Chondrichthyan Dentition

P1-231 *Holding ML, Trevine V, Zinenko O, Strickland JL, Rautsaw RM, Hofmann EP, Hogan MP, Grazziotin FG, Parkinson CL, Santana SE, Davis MR, Rokyta DR; Florida State University, Instituto Butantan, VN Karazin Kharkiv National University, Clemson University, University of Washington* — The beak of the snake: fang length evolution in vipers is predicted by diet

Science Communication & Outreach

P1-232 *Tanner RL; Washington State Univ* — Building a Network of Science Communicators for Change: Strategies from the National Network for Ocean and Climate Change Interpretation

P1-233 *Thawley CJ, Kostka AL, Kolbe JJ; Davidson College, University of Rhode Island* — Ecology by the people: How can citizen science inform our understanding of lizard ecology?

P1-234 *Butler JM, Wayne CR*, Maruska KP; Louisiana State University* — If fish could talk: Using cartoons and comics to disseminate and enhance science literacy

P1-235 *Sacks PE, Walters LJ, Donnelly MJ; University of Central Florida* — Oral Histories to Improve Coastal Restoration

P1-236 *Schwalb A, Lepkowski J, Renninger A, Davidson B; WB Saul High School, University of Pennsylvania, Swarthmore College* — Relevance and Complexity: Teaching Cancer Biology to Middle School Students

P1-237 *Lucas KN, Keep S, Morey S; University of Michigan, BiteScis, Abbott Lawrence Academy* — BiteScis: Teacher-Researcher Partnerships to Develop Engaging Research-Based Lessons

P1-238 *Maltby R, Willis KL, Markham MR; University of Oklahoma* — Weakly Electric Fish as Charismatic Midi-fauna: Lessons in Neuroscience Broader Impacts.

Stress

P1-239 *Nebhut AN, Semro MR, Shinkle JR; Trinity University* — The Relevance of Short Wavelength UV-B Radiation in Natural Light Environments

P1-240 *Semro MR, Nebhut AN, Carroll KR, Shinkle JR; Trinity University* — Stress then Acclimation: Effect of UV Radiation on Kale Growth, Pigmentation, and Antioxidant Content

P1-241 *Wright-Lichter JX, Gormally BMG, Romero LM; Tufts University* — Feather corticosterone concentrations not related to DNA damage in house sparrows

P1-242 *Dehnert GD, Karasov WH, Lindborg AR; University of Wisconsin* — 2,4-D impacts on whole-body cortisol response in larval fathead minnows

P1-243 *Titon Jr. B, Barsotti AMG, Vaz RI, Teixeira RV, Navas CA, Gomes FR; University of São Paulo* — Annual Baseline and Post Restraint Hormonal and Immune Variations in Males of Toads (*Rhinella icterica*)

P1-244 *Estrada RS, Gormally BMG, Romero LM; Tufts University* — Assessing Background DNA Damage across Tissues in House Sparrows

P1-245 *Woodruff MJ, Sermersheim LO, Rosvall KA; Indiana University* — Do endotherms acclimate to heat? Physiological responses to a simulated heat wave in free-living birds

P1-246 *McGrath MR, Howey CAF; University of Scranton* — Ambient Light at Night (ALAN) and the Stress Response of Green Anoles

P1-247 *Choi MP, Rubin AM, Wada H; Auburn University* — Effects of Incubation Temperatures and Restraint on Beak Coloration in Zebra Finches

P1-248 *Coutts VM, Beatty A, Schwartz T, Cooper C, Hurley L, Griffith S, Wada H; Auburn University, Macquarie University* — Changes in Gene Expression in Response to Ambient Temperature Fluctuations in the Zebra Finch

P1-249 *Gormally BMG, Macy RR, Martin K, Wright-Lichter JX, Romero LM; Tufts University* — Expanding the dexamethasone suppression test: assessing multiple synthetic glucocorticoids in house sparrows (*Passer domesticus*)

P1-250 *Bryant AR, Gabor CR, Swartz LK, Lowe WH, Wagner R; Texas State University, University of Montana, Ohio University* — Steam Salamander Larvae Downregulate Corticosterone in the Presence of Fish Predators

P1-251 *Hoffman AJ, Finger JW, Wada H; Auburn University* — Mild Developmental Stress and its Effects on Adult Tissue Oxidative Status

P1-252 *Ridenour M, Grindstaff JL*; Oklahoma State University* — Hormonal Mediation of Sibling Rivalry in Eastern Bluebirds (*Sialia sialis*)

P1-253 *Semel MA, Ratovoson JC, Moore IT; Virginia Tech, University of Antananarivo* — Impact of habitat type and disturbance level on golden-crowned sifaka (*Propithecus tattersalli*) fecal glucocorticoid metabolite levels

P1-254 *Martinez V, Grace JK; Texas A&M University* — Interactions between stress hormones and blood parasites along elevation gradients

P1-255 *Chrisler AD, Antunes IK, Kimball MG, Malisch JL; St Mary's College of Maryland, Louisiana State University* — Modeling glucocorticoid physiology, glucose mobilization, and return rate in migrating Mountain White-crowned Sparrows (*Zonotrichia leucophrys oriantha*)

P1-256 *Gardner LE, Watson CM, Shipley MM; Midwestern State University* — The Physiological Effects of Cannabidiol on Toads

P1-257 *Falso PG, Marshall LV, Gustafson KL, Falso MS, Zajac JM, Strain SR; Slippery Rock University* — Effect of Neonicotinoid Pesticide Exposure On The Stress Response In African Clawed Frogs (*Xenopus laevis*)

P1-258 *Antunes IK, Johnson EB, Mertz PS, Malisch JL; St Mary's College of Maryland, University of Pittsburgh* — Development of an Enzyme Linked Immunosorbent Assay for Avian Corticosterone Binding Globulin

P1-259 *Walker NJ, Morales OJ, Boyles JG, Warne RW; Southern Illinois University* — Glucocorticoid and Behavioral Responses to Environmental Perturbations

P1-260 *Bebus SE, Jones BC, Anderson RC; Florida State University, Florida Atlantic University* — Brood-parasitized nestlings have higher baseline corticosterone concentrations

P1-260.5 *Arlinghaus K, Challener R*; Bellarmine University* — Impacts of Ultraviolet Light Exposure on the Activity of Antioxidant Enzymes in the Coelomocytes of the Sea Urchins *Lytechinus variegatus* and *Arbacia punctulata*

Lipids

P1-261 *Montano DF, Kanatous SB; Colorado State University* — Are you what you eat? Do lipids cause an intracellular response within skeletal muscle cells?

P1-262 *Rippamonti JR, De Silva IW, Dzialowski EM, Verbeck GF, Price ER; University of North Texas* — Investigation of Lipid Changes During the Ontogeny of Endothermy

P1-263 *Torres T, Watson CM, Shipley MM; Midwestern State University* — Fatty acid composition of native milkweed species (*Asclepias*) of North Texas made available to insect predators

P1-264 *Brogren D, Burley A, Holihan M, Graves S, Chrysler J, Popps K, Scott J; Saginaw Valley State University* — High fat diets induce early signs of non-alcoholic fatty liver disease (NAFLD) independent of carbohydrate content

P1-265 *Moniz LE, Lyons K, Hoopes L, Lewis JM, Bedore CN; Georgia Southern University, Georgia Aquarium* — Lipid Metabolites as Energy Stores in Batoids

Microbiomes: the multitudes

P1-266 *Krishnan A, Singh A, Faber-Hammond JJ, Renn SCP; Reed College* — Effect of Social Stress on Gut Microbiome in *Astatotilapia burtoni*

P1-267 *Williams CE, Kueneman JG, McMillan WO, Cox CL, Logan ML; Northeastern Univ, Smithsonian, Georgia Southern Univ, Univ Nevada, Reno* — The response of the gut microbiome to climate warming in a vertebrate ectotherm: A field-transplant experiment in the Panama Canal

P1-268 *Titus BM, Laroche RAS*, Rodríguez E, Wirshing H, Meyer CP; American Museum of Natural History, Rice University, Smithsonian Institution* — Host Identity and Symbiotic Association Affects the Genetic and Functional Diversity of the Clownfish-Hosting Sea Anemone Microbiome

P1-269 *Murphy KM, Watkins M, Finger JW, Kelley MD, Elsey RM, Warner DA, Mendonça MT; Auburn University, Rockefeller Wildlife Refuge* — Xenobiotic estradiol-17ß and the microbial gut communities of hatchling American alligators (*Alligator mississippiensis*)

P1-270 *Miller A, Agyei D, Jilani C, Joshi D, Odaka Y, Owen P, Tran M, Wilson K; University of Cincinnati Blue Ash College* — Effects of Plant-based Diet on the Gut Microbiota in Rusty Crayfish (*Faxonius rusticus*)

P1-271 *Grimes CJ, Labontè J, Lopez JV, Schulze A; Texas A&M University at Galveston, Nova Southeastern University* — Microbiomes of a corallivore (*Hermodice carunculata*): where in the worm are the coral microbes?

P1-272 *Heitzman NS, Lower SE; Bucknell University* — Relationship between sex, life stage, and gut microbial communities in *Photuris* fireflies

Sunday Schedule of Events

Events take place in the JW Marriott Austin, unless otherwise noted

EVENT	TIME	LOCATION
Poster Session 2 Set Up	7:00 AM – 8:00 AM	Grand Ballroom
Speaker Ready Room	7:00 AM – 5:00 PM	Room 405
Registration	7:30 AM – 3:30 PM	Grand Ballroom Foyer
Coffee Break AM	9:30 AM – 10:30 AM	Grand Ballroom
Exhibit Hall	9:30 AM – 5:30 PM	Grand Ballroom
Coffee Break PM	3:30 PM – 4:30 PM	Grand Ballroom
Poster Session 2 Even Numbers Authors Present	3:30 PM – 4:30 PM	Grand Ballroom
Poster Session 2 Odd Numbers Authors Present	4:30 PM – 5:30 PM	Grand Ballroom
Poster Session 2 Teardown	5:30 PM – 6:00 PM	Grand Ballroom

SPECIAL LECTURE

AMS Lecture: Dr. Sara Lindsay The Art of Seeing: Using Microscopy to Power STEAM Learning in Biology	7:00 PM – 8:00 PM	Rooms 301-302
Bern Lecture: Dr. George Bentley A Bird's Eye View of Reproductive Endocrinology	7:00 PM – 8:00 PM	Salons D-E

SYMPOSIUM ORAL PRESENTATIONS

S4: Reproduction: the Female Perspective from an Integrative and Comparative Framework Chairs: Virginia Hayssen, Teri Orr	7:45 AM – 4:00 PM	Lone Star D
S5: Form, structure and function: How plants vs. animals solve physical problems Chairs: Ulrike Müller, Simon Poppinga	8:30 AM – 3:30 PM	Rooms 303-304
S6: Bio-inspiration of silent flight of owls and other flying animals: recent advances and unanswered questions Chairs: Chris Clark, Justin Jaworski	8:00 AM – 3:30 PM	Lone Star H

CONTRIBUTED PAPER ORAL PRESENTATIONS

MORNING

Session 35: Complementary to S3: Biology at the Cusp: Teeth as a Model Phenotype for Integrating Developmental Genomics, Biomechanics, and Ecology	8:00 AM – 10:00 AM	Lone Star A
Session 36: Comparative Genomics and Phylogenetics in Vertebrates	8:00 AM – 9:30 AM	Lone Star B
Session 37: Macroevolution and Evolutionary Paleobiology	8:00 AM – 10:00 AM	Lone Star C
Session 38: Fire When Ready: Muscle Activity	8:00 AM – 9:30 AM	Lone Star E
Session 39: DNNSB Best Student Paper	8:00 AM – 10:00 AM	Lone Star F
Session 40: Walking in Water	8:00 AM – 9:45 AM	Lone Star G
Session 41: What I Need: a Good Immune Defense	8:15 AM – 10:00 AM	Rooms 301-302
Session 42: Morphology and Function: A Rocky Relationship	8:00 AM – 9:45 AM	Room 205
Session 43: Adaptation and Changes in Environment	8:00 AM – 9:45 AM	Rooms 201-202
Session 44: Hot Flashes to Molecular Modulation – Thermo and Chemical Ecology	8:00 AM – 9:30 AM	Rooms 203-204
Session 45: Special Session: Celebrating the Scientific Contributions of Rosemary Knapp: Hormones and Alternative Reproductive Tactics, Part I	8:00 AM – 9:45 AM	Brazos
Session 46: Devo-evo	8:00 AM – 9:45 AM	Rooms 402-403
Session 47: Complementary to S2: Epigenetic Variation in Endocrine System	10:30 AM – 12:00 PM	Lone Star A
Session 48: DIZ Best Student Paper Session	10:00 AM – 12:00 PM	Lone Star B
Session 49: Special Session: Digestive Physiology: A Session in Honor of Bill Karasov, Part I	10:30 AM – 12:00 PM	Lone Star C
Session 50: DVM Best Student Paper: D. Dwight Davis Award	10:00 AM – 12:00 PM	Lone Star E
Session 51: Neuroethology & Visual Sensing	10:15 AM – 12:00 PM	Lone Star F
Session 52: Getting Real: Effects of Multiple Stressors on Organisms	10:15 AM – 12:00 PM	Lone Star G
Session 53: Immune-based Tradeoffs	10:30 AM – 11:45 AM	Rooms 301-302

Session 54: Adaptation and Genes	10:15 AM – 12:00 PM	Room 205
Session 55: Growth Factors & Neuropeptides	10:30 AM – 12:00 PM	Rooms 201-202
Session 56: Beat it (the Heat)- Combating Stress in Coral Reefs, Part I	10:00 AM – 12:00 PM	Rooms 203-204
Session 57: Special Session: Celebrating the Scientific Contributions of Rosemary Knapp: Hormones and Alternative Reproductive Tactics, Part II	10:15 AM – 12:00 PM	Brazos
Session 58: Evo-devo	10:15 AM – 11:30 AM	Rooms 402-403

AFTERNOON

Session 59: Complementary to S1: New Frontiers in Antarctic Marine Biology	1:30 PM – 3:00 PM	Lone Star A
Session 60: The Biology Underground	1:30 PM – 3:30 PM	Lone Star B
Session 61: Special Session: Digestive Physiology: A Session in Honor of Bill Karasov, Part II	1:30 PM – 2:45 PM	Lone Star C
Session 62: Animals in Compliance: Structural Mechanics	1:30 PM – 3:15 PM	Lone Star E
Session 63: DAB Best Student Paper: Marlene Zuk Award	1:30 PM – 3:15 PM	Lone Star F
Session 64: You Got the Touch (and Sight and Sound)	1:30 PM – 3:15 PM	Lone Star G
Session 65: Education and External Partnerships	1:30 PM – 3:15 PM	Rooms 301-302
Session 66: Thermoregulation	1:30 PM – 3:15 PM	Room 205
Session 67: Molecular Evolution	1:30 PM – 3:00 PM	Rooms 201-202
Session 68: Beat it (the Heat) – Combating Stress in Coral Reefs, Part II	1:30 PM – 3:00 PM	Rooms 203-204
Session 69: DCE Best Student Paper - Aubrey Gorbman Award	1:30 PM – 3:15 PM	Brazos
Session 70: Sensory Biology & Neuroethology	1:30 PM – 3:15 PM	Rooms 402-403

COMMITTEE AND BOARD MEETINGS

Advisory Committee	7:00 AM – 8:00 AM	Room 401
Membership Committee	7:00 AM – 8:00 AM	Room 409
Broadening Participation Committee Meeting	12:00 PM – 1:30 PM	Room 409
Educational Council	12:00 PM – 1:30 PM	Room 401

BUSINESS MEETINGS

TCS Business Meeting	12:00 PM – 1:30 PM	Room 309
AMS Business Meeting	12:00 PM – 1:30 PM	Room 406
DCE Meeting	5:45 PM – 6:30 PM	Lone Star A
DCB Meeting	5:45 PM – 6:30 PM	Lone Star B
DIZ Meeting	5:45 PM – 6:30 PM	Lone Star C
DOB Meeting	5:45 PM – 6:30 PM	Room 205
DPCB Meeting	5:45 PM – 6:30 PM	Rooms 301-302

WORKSHOPS AND PROGRAMS

Student Postdoctoral Affairs Committee: “How-To?” Daily Booth	9:15 AM – 5:00 PM	Grand Ballroom
Workshop: An Introduction to the World of Book Publishing from Editors and Authors	12:00 PM – 1:30 PM	Room 408
Organizing Meeting for Building Bridges Symposium	12:00 PM – 1:30 PM	Room 407
Symposium 5 Workshop: How to Disseminate Your Research	12:00 PM – 1:30 PM	Room 404
Workshop: Panel on Research and Working at Primarily Undergraduate Institutions	12:00 PM – 1:30 PM	Room 402-403
DPCB Ask-An-Expert: Get Phylogenetic and Comparative Methods Support with an Expert	3:30 PM – 5:30 PM	Grand Ballroom
TAL-X Workshop: Teaching Critical Thinking About Science and Technology: GMOs As a Case Study	7:00 PM – 9:00 PM	Rooms 303-304

SOCIAL EVENTS

Morning Run	6:00 AM	JW Marriott Lobby
DIZ/DEE/TCS/AMS/DPCB/DEDB/DOB Social	8:00 PM – 10:00 PM	South-East Lobbies
Outgroup Social: LGBTQ+ social (allies welcome!), 21+	8:30 PM – 10:30 PM	Location TBD

Sunday Program Symposia

Note: Presenter is first author unless noted by an asterisk (*).

7:45 AM – 4:00 PM **Symposium S4** **Lone Star D**

Reproduction: the Female Perspective from an Integrative and Comparative Framework

Chairs: Virginia Hayssen, Teri Orr

7:45 am	**S4-1**	*Orr TJ, Hayssen V; New Mexico State University, Smith College*	Introduction
8:00 am	**S4-2**	*Hayssen V; Smith College*	Misconceptions about Conception and Other Fallacies: Historical Bias in Reproductive Biology
8:30 am	**S4-3**	*Hook KA, Fisher HS; University of Maryland*	The importance of female reproductive traits: from mice to seed beetles
9:00 am	**S4-4**	*Sirot LK; College of Wooster*	Opportunities for Female Modulation of Seminal Fluid Molecules
9:30 am		**Coffee Break**	**Grand Ballroom**
10:00 am	**S4-5**	*Wolfner MF; Cornell University*	The female side of the male x female interactions that modulate sperm competition and reproduction
10:30 am	**S4-6**	*Lipshutz SE, Rosvall KA; Indiana University*	Neuroendocrinology of sex-role reversal
11:00 am	**S4-7**	*Karachiwalla Z, Decarvalho T, Burns M*; University of Maryland Baltimore County*	Spermathecal Variation By Mating System in Temperate Harvestmen
11:30 am	**S4-8**	*Kimmitt AA, Sinkiewicz DM, Ketterson ED; Texas A&M University, Indiana University*	Female Songbirds that Differ in Migratory Strategy Also Differ in Neuroendocrine Measures in Early Spring
12:00 pm		**Lunch Break**	
1:30 pm	**S4-9**	*Holekamp KE, Montgomery TM, Strauss ED; Michigan State University, University of Nebraska*	Social competition and cooperation affect reproductive success of female spotted hyenas
2:00 pm	**S4-10**	*Lynch KS, Ryan MJ; Hofstra University, University of Texas at Austin*	Social Regulation of Hormones and the Implications for Female Mate Choice
2:30 pm	**S4-11**	*Hawkes K; University of Utah*	The centrality of grandmothers in human evolution
3:00 pm	**S4-12**	*Orr TJ, Hayssen V; New Mexico State University, Smith College*	Where now? Future directions in reproductive biology framed by the female perspective
3:30 pm	**S4-13**	*Orr TJ; New Mexico State University*	Round Table Discussion for Reproduction: the Female Perspective from an Integrative and Comparative Framework
4:00 pm		**Coffee Break**	**Grand Ballroom**

8:15 AM – 3:30 PM **Symposium S5** **Rooms 303-304**

Form, structure and function: How plants vs. animals solve physical problems

Chairs: Ulrike Müller, Simon Poppinga

8:15 am	**S5-1**	*Müller UK, Poppinga S; California State University Fresno, University of Freiburg, Botanic Garden*	Introduction to the symposium
8:30 am	**S5-2**	*Bauer U; University of Bristol*	Functional Surfaces of Insect-trapping Pitcher Plants
9:00 am	**S5-3**	*Stark AY, Yanoviak SP; Villanova University, University of Louisville, Smithsonian Tropical Research Institute*	Adhesive Performance of Tropical Arboreal Ants on Canopy Substrates
9:30 am	**S5-4**	*O'Donnell MK, Deban SM; Brown University, University of South Florida*	The Effect of Water on Salamander Cling Performance at the Critical Roughness
10:00 am		**Coffee Break**	**Grand Ballroom**
10:30 am	**S5-5**	*Deban SM, Holzman R, Müller UK; University of South Florida, Tel Aviv University, California State University*	Suction feeding in small animals and carnivorous plants

11:00 am	**S5-6**	*Whitaker DL; Pomona College*	Nature's weapons of mass reproduction: Ballistic dispersal of seeds and spores
11:30 am	**S5-7**	*Cho MS, Neubauer P, Fahrenson C, Rechenberg I; Technical University of Berlin, Bionics and Evolution Techniques*	A Filament-like Structure for Flight?: The Ballooning Flight of Spiders
12:00 pm	**Lunch Break**		
1:30 pm	**S5-8**	*Deban SM, Holzman R, Müller UK; University of South Florida, Tel Aviv University, California State University Fresno*	Suction feeding in small animals and carnivorous plants
2:00 pm	**S5-9**	*Jaffar-Bandjee M, Steinmann T, Krijnen G, Casas J*; University of Tours, CNRS, University of Twente*	Efficiency of odor capture by multiscale pectinate insect antennae
2:30 pm	**S5-10**	*Poppinga S, Speck T; University of Freiburg*	Abstraction of Slow and Fast Plant Movement Principles for the Technical Transfer into Biomimetic Motile Structures
3:00 pm	**S5-11**	*Lentink D, Chin DD, Hightower BJ, Ingersoll R; Stanford*	Design principles of Fluid Force and Moment Platforms for biological locomotion studies
3:30 pm	**Coffee Break**		**Grand Ballroom**

8:00 AM – 3:30 PM **Symposium S6** **Lone Star H**

Bio-inspiration of silent flight of owls and other flying animals: recent advances and unanswered questions

Chairs: Chris Clark, Justin Jaworski

7:45 am	**S6-1**	*Clark CJ; University of California Riverside*	Introduction to the Symposium on Bioinspiration of silent flight of owls and other flying animals
8:00 am	**S6-2**	*Boonman A, Eitan O, Yovel Y; University of Tel Aviv*	The acoustics of flapping flight in birds and bats; a preliminary analysis
8:30 am	**S6-3**	*Yack JE; Carleton University*	What does a Butterfly Hear? Neurophysiological and Behavioural Responses to Predator Sounds
9:00 am	**S6-4**	*Liu H, Rao C, Nakata T; Chiba University*	Robust strategies in owl silent flight: aerodynamic force production and noise suppression
9:30 am	**S6-5**	*Lepiane KL, Clark CJ; University of California Riverside*	The dorsal velvet surface of owl feathers decreases sounds of rubbing during flapping flight
10:00 am	**Coffee Break**		**Grand Ballroom**
10:30 am	**S6-6**	*Jaworski JW; Lehigh University*	Acoustic models for wing specializations of silent owl species
11:00 am	**S6-7**	*Krishnan K, Ben-Gida H, Guglielmo CG, Gurka R*; CCU, Technion, UWO*	Wake Flow Mechanisms and Aerodynamic Forces of Owls During Flapping Flight
11:30 am	**S6-8**	*Krishnamoorthy K, Capuano F, Gurka R*, Balaras E; Coastal Carolina University, University of Naples Federico II, George Washington University*	Numerical and experimental study of owls flapping flight
12:00 pm	**Lunch Break**		
1:30 pm	**S6-9**	*Clark CJ, Le Piane K; University of California Riverside*	Evolutionary and ecological correlates of silent flight in owls, nightbirds and hawks: Does silent flight evolve for stealth, or to reduce self-masking?
2:00 pm	**S6-10**	*Gall MD, De Koning M, Beatini JR, Proudfoot GA; Vassar College*	Directional sensitivity of Northern saw-whet owls: implications for prey and wing sound detection
2:30 pm	**S6-11**	*Gómez-Bahamón V, Worm A, Castaño M, Donahue E, Tuero D, Clark C, Bates J; University of Illinois, Arkansas State University, Universidad de los Andes, Universidad de Buenos Aires, University of California Riverside, Field Museum*	Non-vocal Acoustic Signals in Kingbirds (genus Tyrannus)
3:00 pm	**S6-12**	*Clark CJ; UC Riverside*	Final roundtable discussion on bioinspiration of silent flight
3:30 pm	**Coffee Break**		**Grand Ballroom**

Sunday Program Morning Sessions

Note: Presenter is first author unless noted by an asterisk (*).

8:00 AM – 10:00 AM **Session 35** **Lone Star A**

Complementary to S3: Biology at the Cusp: Teeth as a Model Phenotype for Integrating Developmental Genomics, Biomechanics, and Ecology

Chairs: Natasha S. Vitek, Tyler A. Square

8:00 am	**35-1**	*Burroughs RW; University of Chicago*	Modeling rodent tooth morphogenesis reveals constraints on mammalian tooth evolution
8:15 am	**35-2**	*Birlenbach DM, Keller JS, Fox DL; University of Minnesota, University of New Mexico*	Morphological Similarity in the Dentition of Competing and Non-Competing Rodents
8:30 am	**35-3**	*Vitek NS, McDaniel SF, Bloch JI; Stony Brook University, University of Florida, Florida Museum of Natural History*	Is variation in molar tooth crown morphology of the Grasshopper Mouse (*Onychomys leucogaster*) a reflection of selection or drift?
8:45 am	**35-4**	*Eddins HMS, Kligman BT, Nesbitt SJ, Marsh A, Parker W, Stocker MR; Virginia Tech, Petrified Forest National Park*	New Triassic Reptile Reveals Oldest Record of a Complete Envenomation Apparatus
9:00 am	**35-5**	*Kay DI, Gignac PM, O'Brien HD; Oklahoma State University*	Do sockets shape teeth in non-mammalian thecodonts? A case study in *Alligator mississippiensis*
9:15 am	**35-6**	*Kim SL, Yeakel JD, Eberle JJ, Zeichner SS; University of California, Merced, University of Colorado, Boulder, California Institute of Technology*	Impacts of Environmental Gradients on Shark Body Size: a Comparison from Fossil Evidence and Demographic Modeling of Sand Tigers
9:30 am	**35-7**	*Colombero CR, Wainwright DK, Lauder GV; Harvard University, Yale University*	Shark Dermal Denticles: Loss and Regeneration Patterns Vary with Body Position and Ecotype
9:45 am	**35-8**	*Square TA; University of California, Berkeley*	Stem Cell Markers Reveal Conservation of Tooth and Hair Regeneration

10:00 am **Coffee Break** **Grand Ballroom**

8:00 AM – 9:30 AM **Session 36** **Lone Star B**

Comparative Genomics and Phylogenetics in Vertebrates

Chair: Dave Blackburn

8:00 am	**36-1**	*Hill EC, Jarman MJ, Butler MA; University of Hawaii*	The Resolution Solution: Increasing Nodal Support in the Problematic Phylogeny for a Large Adaptive Radiation of Papuan Asterophryne Frogs
8:15 am	**36-2**	*Blackburn DC, Nielsen SV, Barej M, Rödel MO; University of Florida, Museum für Naturkunde*	Systematics and Biogeography of the African Slippery Frogs (genus *Conraua*), Including the World's Largest Living Frog
8:30 am	**36-3**	*Marshall TL, Davis DR, Hillis DM; University of Texas at Austin, University of Texas Rio Grande*	Mitonuclear Discordance in the North American corn snakes (Pantherophis guttatus complex)
8:45 am	**36-4**	*Osmanski AB, Johnson M, Gongora J, Densmore III LD, Ray DA; Texas Tech University, University of Sydney*	Genomic Signatures of Selection Detection Across the Order Crocodylia
9:00 am	**36-5**	*Perry BW, Schield DR, Mackessy SP, Castoe TA; University of Texas Arlington, University of Northern Colorado*	Mechanisms Driving Venom Gene Regulation in Rattlesnakes Revealed Through Integrative Analyses of Genome Structure and Function.
9:15 am	**36-6**	*Simpson DY, Telemeco R, Langkilde T, Schwartz TS; Auburn University, California State University, Pennsylvania State University*	Differential Gene Expression to heat or fire ant envenomation in *Sceloporus undulatus*

9:30 am **Coffee Break** **Grand Ballroom**

8:00 AM – 10:00 AM **Session 37** **Lone Star C**

Macroevolution and Evolutionary Paleobiology

Chair: Tom Stewart

8:00 am	**37-1**	*Chapman BR, Wilson LE; Fort Hays State University*	Predicting habitat preferences of *Hesperornis* (Aves: Hesperornithiformes) in the Western Interior Seaway through occupancy modeling
8:15 am	**37-2**	*Stocker MR, Nesbitt SJ, Angielczyk K, Sidor C, Fortner J, Olroyd S, Lungmus J, Smith R; Virginia Tech, Field Museum, University of Washington, Southern Methodist University, University of Chicago, University of the Witwatersrand*	A New, Small Arboreal Reptile from the Upper Permian of Tanzania
8:30 am	**37-3**	*Stewart TA, Lemberg JB, Shubin NH; University of Chicago*	The evolution of dermal rays in tetrapodomorph paired fins
8:45 am	**37-4**	*Lynch LM, McKenna ME, Dudgeon JV; Washington University, Idaho State University, Center for Archaeology, Materials, and Applied Spectroscopy Center*	Living on the edge: ecology of the extinct Noble marten as determined by morphological and isotopic evidence
9:00 am	**37-5**	*Ledesma D, Kemp M; University of Texas, Austin*	Changes in central Texas fossil herpetofauna
9:15 am	**37-6**	*Felice RN, Pol D, O'Connor PM, Goswami A; UCL, CONICET, Ohio University, NHM*	Crocodyliform Cranial Constraint and Convergence
9:30 am	**37-7**	*Stayton CT, Price SA, Wainwright PC, Friedman ST; Bucknell University, Clemson University, UC Davis*	What does it take to make an eel? Convergence and adaptation in the evolution of an eel-like body plan
9:45 am	**37-8**	*Miyashita T, Gess RW, Coates MI; University of Chicago, Albany Museum*	The Evolutionary Origin of the Filter-feeding Larval Phase in Lampreys

10:00 am **Coffee Break** **Grand Ballroom**

8:00 AM – 9:30 AM **Session 38** **Lone Star E**

Fire When Ready: Muscle Activity

Chair: David Carrier

8:00 am	**38-1**	*Rice N, Jeong S, Nishikawa K; Northern Arizona University*	How do Muscle Length and Activation Interact to Determine Muscle Force Production?
8:15 am	**38-2**	*Jimenez YE, Brainerd EL; Brown University*	Regionalized contributions of the epaxial musculature to swimming and suction feeding in bluegill sunfish
8:30 am	**38-3**	*Wood LJ, Tobalske BW, Altshuler DL; University of British Columbia, University of Montana*	A Specialized Muscular System Enables Highly Dynamic Wing Motions in Passerine Birds
8:45 am	**38-4**	*Bortoni A, Morris AT, Young IR, Breuer KS, Swartz SM; Brown University*	Synchronous Muscle Recruitment for Stable Flight Control in Egyptian Fruit Bats
9:00 am	**38-5**	*Boynton AM, Carrier DR; University of Utah*	Function of cervical muscles during human running
9:15 am	**38-6**	*Carrier DR, Boynton AM; University of Utah*	The Neck is Part of the Human Core

9:30 am **Coffee Break** **Grand Ballroom**

8:00 AM – 10:00 AM **Session 39** **Lone Star F**

DNNSB Best Student Paper

Chair: Mike Baltzley

8:00 am	**39-1**	*Dolphin KE, Fischer EK, Hughes KA, Hoke KL; Colorado State University, Stanford University, Florida State University*	What in your right mind would make you do that!? Identifying neural components of courtship decisions
8:15 am	**39-2**	*Duncan CM, Christian H, Chmura H, Buck CL, Barnes BM, Loudon A, Williams C; Univ of Alaska Fairbanks, Univ of Oxford, Northern Arizona Univ, Univ of Manchester*	Ultrastructural Changes of Reproductive Neuroendocrine and Endocrine Responding Cells Associated with Circannual Timing in a Hibernating Mammal
8:30 am	**39-3**	*Anselmo CM, Butler JM, Maruska KP; Louisiana State University, Baton Rouge*	Can you feel me now?: The lateral line system mediates reproduction in an African cichlid

8:45 am	**39-4**	*Ko D, Haddad A, Lin HT; Imperial College London*	Visual Target Information Encoding Mechanisms in the Dragonfly
9:00 am	**39-5**	*Yarger AM, Smith AJ, Razmi AN, Fox JL; Case Western Reserve University*	Haltere synchrony in flies
9:15 am	**39-6**	*Rodriguez-Santiago M, Jordan LA, Hofmann HA; University of Texas at Austin, University of Konstanz*	Social Context Affects Learning and Neural Activity Patterns in Dynamic Social Groups
9:30 am	**39-7**	*Kanwal JK, De Bivort BL, Samuel A; Harvard University*	Early integration of multisensory information in the *Drosophila* larva
9:45 am	**39-8**	*Raja SV, Sane SP; National Centre for Biological Sciences, Tata Institute of Fundamental Research*	Collective movements of mound-building termites

10:00 am **Coffee Break** **Grand Ballroom**

8:00 AM – 9:45 AM **Session 40** **Lone Star G**

Walking in Water

Chairs: Amanda Palecek, Melina Hale

8:00 am	**40-1**	*Hale ME, Goolsbee AW; University of Chicago*	Substrate-based locomotion in young octopuses.
8:15 am	**40-2**	*Heydari S, Po T, McHenry MJ, Kanso E; University of Southern California, University of California, Irvine*	Sea Star Inspired Crawling and Bouncing
8:30 am	**40-3**	*Gassler TR, Flammang BE; New Jersey Institute of Technology*	Animated “Foot” Control During Walking in Skates
8:45 am	**40-4**	*Travis KG, Kawano SM; California State University Long Beach, George Washington University*	Comparative biomechanics of submerged and emerged walking in the epaulette shark (*Hemiscyllium ocellatum*)
9:00 am	**40-5**	*Crawford CH, Cerrato-Morales CL, Flammang BE; New Jersey Institute of Technology*	Comparative Kinematics of Terrestrial Walking in Two Balitorid Loaches
9:15 am	**40-6**	*Amplo HE, Flammang BE; Rutgers Univeristy-Newark, New Jersey Institute of Technology*	Frogfish Pectoral Fin Functional Morphology
9:30 am	**40-7**	*Palecek-McClung AM, Blob RW; Clemson University*	Wading through water: The influence of water depth on the locomotion of the Chilean Flamingo (*Phoenicopterus chilensis*)

9:45 am **Coffee Break** **Grand Ballroom**

8:15 AM – 10:00 AM **Session 41** **Rooms 301-302**

What I Need: A Good Immune Defense

Chairs: Catherine Tylan, Katherine Buckley

8:15 am	**41-1**	*Dearborn DC, Warren S, Hailer F; Bates College, Cardiff University*	Meta-analysis of Diversity and Selection at MHC Class II A Genes: the Neglected Half of the Vertebrate Immune System’s Heterodimer
8:30 am	**41-2**	*Tylan C, Langkilde T; Pennsylvania State University*	Immune Function Changes in Response to Consumption of and Stings from Fire Ants, an Invasive Predator and Prey of Native Lizards
8:45 am	**41-3**	*Love AC, Durant SE*, Wilder SM, Youseff NH; U Arkansas, Ok State*	Macronutrients, the microbiome, and illness-induced feeding behavior: Are birds shaping immune responses through selective feeding?
9:00 am	**41-4**	*Becker DJ, Schultz EM, Atwell JW, Hall RJ, Ketterson ED; Indiana University, Wittenberg University, University of Georgia*	Urban residency, host immunity, and infectious disease dynamics in a traditionally migratory songbird
9:15 am	**41-5**	*Downs CJ, Schoenle LA, Martin LB; SUNY College of Environmental Science & Forestry, Hamilton College, University of South Florida*	How Does Microbicidal Capacity of Serum Scale with Body Mass in Mammals?
9:30 am	**41-6**	*Love AC, Grisham K, Durant SE; University of Arkansas, Oklahoma State University*	Perception of Infection: Public Information about Disease Influences Immunity in Songbirds
9:45 am	**41-7**	*Buckley KM; Auburn University*	Immune Responses in Sea Urchin Larvae Highlight Fundamental Aspects of Animal Immunity

10:00 am **Coffee Break** **Grand Ballroom**

8:00 AM – 9:45 AM **Session 42** **Room 205**

Morphology and Function: A Rocky Relationship

Chair: Mark Westneat

8:00 am	**42-1**	*Westneat MW, Gartner SM, Cooper WJ; University of Chicago, Washington State Univ*	JawsModel 2020: Tracking the Transmission of Force and Motion in Fish Cranial Linkage Systems Through Phylogenetic History
8:15 am	**42-2**	*Larouche O, Friedman ST, Corn KA, Martinez CM, Wainwright PC, Price SA; Clemson University, University of California, Davis*	Does Habitat Complexity Affect the Direction of Body Shape Evolution in Marine Fishes?
8:30 am	**42-3**	*Pos KM, Kolmann MA, Gao T, Hernandez LP, Gidmark NJ; George Washington University, University of Chicago, Knox College*	Morphological evolution within minnows exhibits decoupling of form & function during periods of climate change in North America
8:45 am	**42-4**	*Juarez BH, Moen DS, Adams DC; Iowa State University, Oklahoma State University*	Morphology Predicts Interspecific Jumping Performance in Frogs
9:00 am	**42-5**	*Gray JA, Sherratt E, Hutchinson MN, Jones MEH; Oklahoma State University, University of Adelaide, South Australian Museum, University College London*	Dragons of the trees, the rocks, and the ground: the evolution of cranial shape in a continental-scale evolutionary radiation of lizards (Lepidosauria: Agamidae)
9:15 am	**42-6**	*Quinn BL, Morales AE, Simmons NB; Temple University, American Museum of Natural History*	Predicting Foraging Strategies from Morphological Traits in *Myotis*
9:30 am	**42-7**	*Lungmus JK, Angielczyk KD, Luo ZX; University of Chicago, Field Museum of Natural History*	Limb Ecometrics Show Limited Applicability for Quantifying Ecological Novelty in the Deep Evolution of Synapsida

9:45 am **Coffee Break** **Grand Ballroom**

8:00 AM – 9:45 AM **Session 43** **Rooms 201-202**

Adaptation and Changes in Environment

Chair: Carla Madelaire

8:00 am	**43-1**	*Sirovy KA, Kelly MW, Johnson KM; Louisiana State University*	Intraspecific variation in the stress response of the Eastern Oyster, *Crassostrea virginica, to salinity changes within the northern Gulf of Mexico*
8:15 am	**43-2**	*Bontrager M, Muir CD*, Mahony C, Gamble DE, Germain RM, Hargreaves AL, Kleynhans EJ, Thompson KA, Angert AL; University of British Columbia, University of California, Davis, University of Hawai'i, McGill University*	Climate anomalies are altering local adaptation
8:30 am	**43-3**	*Grimes CJ, Paiva PC, Petersen L, Schulze A; Texas A&M University at Galveston, Universidade Federal do Rio de Janeiro*	How fireworms, *Hermodice carunculata*, react to hypoxia: morphological, physiological and gene expression responses
8:45 am	**43-4**	*Sharpe SL, Ungerer MC, Nippert JB; Kansas State University*	Effects of Abiotic Stress Across Population in Wild Foxtail Millet *Setaria viridis*
9:00 am	**43-6**	*Velotta JP, Robertson CE, Schweizer RM, McClelland GB, Cheviron ZA; University of Montana, McMaster University*	A developmental delay in thermogenesis is associated with adaptive shifts in gene expression in high-altitude deer mice
9:15 am	**43-7**	*Madelaire CB, Barsotti AMG, Wagener C, Sugano Y, Baxter-Gilbert J, Gomes FR, Measey J; Northern Arizona University, University of São Paulo, Stellenbosch University*	Invasive toads shift behavioral traits to find water
9:30 am	**43-8**	*Nicholson DJ, Logan ML, Cox CL, McMillan WO, Garner TWJ, Knell RJ; Queen Mary University London, University of Nevada, Florida International University, Smithsonian Tropical Research Institution, Zoological Society of London*	Population dynamics and morphological change after experimental colonization of a novel environment.

9:45 am **Coffee Break** **Grand Ballroom**

8:00 AM – 9:30 AM **Session 44** **Rooms 203-204**

Hot Flashes to Molecular Modulation – Thermo and Chemical Ecology

Chair: Tim Wollesen

8:00 am	**44-1**	*Shields-Estrada AK, Cannatella DC; University of Texas at Austin*	Near Infrared Reflectance & Thermoregulation in *Epipedobates* Poison Frogs
8:15 am	**44-2**	*Toxopeus J, Dowle EJ, Ragland GJ; University of Colorado, University of Otago*	Tracking Physiological Time: Timing and Duration of Cold Exposure Impacts Seasonal Life History Timing in a Temperate Insect
8:30 am	**44-3**	*Karasov WH, Dehnert GK; University of Wisconsin, Madison*	Non Target Impacts of the Herbicide 2,4,-D on Early Life Stages of Fish
8:45 am	**44-4**	*Fisher II AL, Desjardins N, Degrandi-Hoffman G, Smith B, Johnson M, Kaftanoglu O, Cogely T, Fewell J, Harrison J; Arizona State University, United States Department of Agriculture*	A widely-used fungicide produces symptoms of colony collapse disorder in honey bees (*Apis mellifera*)
9:00 am	**44-5**	*Huynh AH, Rice AM; Lehigh University*	Chemical communication in a hybridizing chickadee system: olfaction and reproductive isolation
9:15 am	**44-6**	*Glynn KJ, Zahor DL, Chiparus SL, Cornelius JM; Eastern Michigan University, Oregon State University*	Did the flint water crisis also harm wild birds? Examining blood lead of three urban birds in Flint, MI

9:30 am **Coffee Break** **Grand Ballroom**

8:00 AM – 9:45 AM **Session 45** **Brazos**

Special Session: Celebrating the Scientific Contributions of Rosemary Knapp: Hormones and Alternative Reproductive Tactics, Part I

Chairs: Ignacio Moore, Sarah Woodley

8:00 am	**45-1**	*Woodley SK, Moore IT; Duquesne University, Virginia Tech*	Introduction to Celebrating the scientific contributions of Rosemary Knapp: hormones and alternative reproductive tactics
8:15 am	**45-2**	*Neff BD; Western University*	Hormones and Behavior in Sunfish: Celebrating 17 years of Collaboration with Rosemary Knapp
8:30 am	**45-3**	*Grober MS, Pradhan DS; Georgia State University, Idaho State University*	Rosemary Knapp: scientist, colleague, mentor, friend
8:45 am	**45-4**	*Leary CJ; University of Mississippi*	Hormonal Regulation of Alternative Mating Tactics in Anuran Amphibians: A Tribute to Rosemary Knapp
9:00 am	**45-5**	*Partridge CG, MacManes MD, Knapp R, Neff BD; Grand Valley State University, University of New Hampshire, University of Oklahoma, University of Western Ontario*	Brain transcriptional profiles of alternative reproductive tactics in bluegill sunfish
9:15 am	**45-6**	*Churchman EKL, Hain TJA, Knapp R, Neff BD; University of Western Ontario, University of Oklahoma*	Perceived paternity affects parental care behaviour in bluegill sunfish (*Lepomis machrochirus*)
9:30 am	**45-7**	*Bass AH; Cornell University*	Behavioral Timing: The Essential Role of Neurohormonal Mechanisms

9:45 am **Coffee Break** **Grand Ballroom**

8:00 AM – 9:45 AM **Session 46** **Rooms 402-403**

Devo-evo

Chair: Emily Setton

8:00 am	**46-1**	*Wollesen T, Musser J, Bertucci P, Arendt D; European Molecular Laboratory*	Single Cell RNA-sequencing reveals molluscan cell types and sheds light on the evolution of a complex bilaterian body plan
8:15 am	**46-2**	*Rojo Arreola L, Romero R, Diaz Dominguez L, Garcia Carreño F; Centro de Investigaciones Biologicas del Noroeste*	Proteolytic profile through larvae development in *Penaeus vannamei*: activity and transcriptional approach

8:30 am	**46-3**	*Setton EVW, Sharma PP; University of Wisconsin - Madison*	The fly cannot save us: Using developmental transcriptomes to probe the genetic architecture of spider spinnerets
8:45 am	**46-4**	*Oel AP, Lamanna F, Hervas-Sotomayor F, Kaessmann H, Arendt D; EMBL Heidelberg, ZMBH, University of Heidelberg*	Evolution of retinal cell types in the sea lamprey, *Petromyzon marinus*
9:00 am	**46-5**	*Kimura J, Ricci L, Luo YJ, Srivastava M; Harvard University*	Development of the acoel worm Hofstenia miamia and the embryonic origin of neoblasts
9:15 am	**46-6**	*Hulett RE, Potter D, Luo YJ, Ricci L, Srivastava M; Harvard University*	Identifying regulators of neural cell-type diversity during regeneration in the acoel *Hofstenia miamia*
9:30 am	**46-7**	*Lochab AK, Extavour CG; Harvard University*	Traveling Without a Destination: Primordial Germ Cell Migration in a Hemipteran Insect

9:45 am **Coffee Break** **Grand Ballroom**

10:30 AM – 12:00 PM **Session 47** **Lone Star A**

Complementary to S2: Epigenetic Variation in Endocrine System

Chairs: Vania R. Assis, Sebastian G. Alvarado

10:30 am	**47-1**	*Alvarado SG, Krupakar H; Queens College CUNY, GE Healthcare*	Developing an automated pipeline for quantifying animal pigmentation using deep learning
10:45 am	**47-2**	*Teixeira RV, Titon SCM, Titon Jr. B, Gomes FR, Assis VR*; University of Sao Paulo*	Trace elements and amphibian's immunity - what can we expect?
11:00 am	**47-3**	*Stevenson TJ; University of Glasgow*	Rhythmic Epigenetics and the Neuroendocrine Regulation of Reproduction in a Seasonal Rodent.
11:30 am	**47-5**	*Ragsdale AK, Dutoit L, Besson AA, King T, Gemmell NJ, Hore T, Johnson SL; University of Otago, University of Alberta*	Paternal hypoxia exposure primes offspring for increased hypoxia resistance
11:45 am	**47-6**	*Schrey A, Miller K, Loggins F, Wieczorek P, McCoy E, Mushinsky H; Georgia Southern University, Dartmouth College, University of South Florida*	Epigenetic and Genetic Characteristics of Dispersal of the Florida Sand Skink

12:00 pm **Lunch Break**

10:00 AM – 12:00 PM **Session 48** **Lone Star B**

DIZ Best Student Paper Session

Chairs: Ken Halanych, Linda Walters

10:00 am	**48-1**	*Conkling ME, Hesp K, Munroe S, Sandoval K, Martens DE, Sipkema D, Wijffels RH, Pomponi SA; Florida Atlantic University, Wageningen University*	Breakthrough in Marine Invertebrate Cell Culture: Sponge Cells Divide Rapidly in Improved Nutrient Medium
10:15 am	**48-2**	*Webb SJ, Sebright Z, Taylor JRA; Scripps Institution of Oceanography, UCSD*	Roles pH and Temperature May Play in the Life History of the Tuna Crab, *Pleuroncodes planipes*
10:30 am	**48-3**	*Liguori AL; Stony Brook University*	Exploring local adaptation to salinity and temperature variability in the copepod *Tigriopus californicus*
10:45 am	**48-4**	*Bedgood SA, Bracken MES; University of California Irvine*	Making it Big and Losing Friends: Algal Symbiont Contributions are Shaped by Sea Anemone Life History
11:00 am	**48-5**	*Coelho JC, Poole AZ; Berry College*	The Evolution and Role of GTPases of Immunity Associated Proteins (GIMAPs) in Cnidarians
11:15 am	**48-6**	*Barnes DK, Allen JD; William & Mary*	Predator-induced plasticity across echinoderm life history stages
11:30 am	**48-7**	*Mack JM, De Carle D, Kvist S; University of Toronto, University of Maryland College Park*	Prey, Populations, and the Pleistocene: Evidence for Low COI Variation in a Widespread North American Leech
11:45 am	**48-8**	*Varney RM, Speiser DI, Kocot KM; Univ of Alabama, Univ of South Carolina*	The genome of the chiton *Acanthopleura granulata*: perspectives on biomineralization from polyplacophorans

12:00 pm **Lunch Break**

10:30 AM – 12:00 PM **Session 49** **Lone Star C**

Special Session: Digestive Physiology: A Session in Honor of Bill Karasov, Part I

Chairs: Kevin Kohl, Denise Dearing

10:30 am	**49-1**	*Trevelline BK, Martínez-Mota R, Derting T, Darracq A, Pasch B, Dearing MD, Kohl KD*; Univ of Pittsburgh, Univ of Utah, Murray State Univ, Northern Arizona Univ*	Nutrient manipulation differentially affects microbiome structure and host physiology in rodents with distinct dietary niches
10:45 am	**49-2**	*McWilliams S, Karasov W, Bauchinger U; University of Rhode Island, University of Wisconsin, Jagellonian University*	Spare capacity and phenotypic flexibility in the digestive system of a migratory bird: defining the limits of animal design
11:00 am	**49-3**	*Tracy CR, McWhorter TJ; University of California Riverside, University of Adelaide Roseworthy*	Paracellular absorption in the slow(er) lane: a brief review of reptilian paracellular nutrient absorption
11:15 am	**49-4**	*Price ER, Jara RF; University of North Texas*	A "Dispersal Syndrome" Approach for Relating High Paracellular Absorption in Birds and Bats to Plant Ecology
11:30 am	**49-5**	*Fassbinder-Orth CA; Creighton University*	Effects of Arbovirus Infections on Digestive Physiology, Growth, and Survival in Young Animals
11:45 am	**49-6**	*Secor SM; University of Alabama*	Underlying Mechanisms that Drive an Adaptive Interplay in Digestive Physiology

12:00 pm **Lunch Break**

10:00 AM – 12:00 PM **Session 50** **Lone Star E**

DVM Best Student Paper: D. Dwight Davis Award

Chair: Patricia Hernandez

10:00 am	**50-1**	*Capano JG, Cieri RL, Weller HI, Brainerd EL; Brown University, University of Utah*	Modular Lung Ventilation in Snakes
10:15 am	**50-2**	*Sellers KC, Middleton KM, Holliday CM; University of Missouri*	Joint Loading and Transformation in Suchian Evolution
10:30 am	**50-3**	*George AB, Westneat MW; University of Chicago*	Swimming Performance Informs Patterns of Evolutionary Ecomorphology Among Triggerfishes and Filefishes (Superfamily: Balistoidea)
10:45 am	**50-4**	*Rupp AE, Moon B; University of Louisiana Lafayette*	Feeding and Digestive Anatomy of Mud Snakes
11:00 am	**50-5**	*Garner AM, Wilson MC, Wright C, Russell AP, Niewiarowski PH, Dhinojwala A; University of Akron, University of Calgary*	Adhesive Setal Morphology and Setal Field Configuration in *Anolis equestris*
11:15 am	**50-6**	*Phillips JR, Hewes AE, Schwenk K; University of Connecticut*	Novel Air-breathing Modes in Anuran Tadpoles
11:30 am	**50-7**	*Hewes A, Schwenk K; University of Connecticut*	A Comparative Study of Lingual Prey Capture in Iguanian and Scincid Lizards
11:45 am	**50-8**	*Diamond KM, Griner JG, Lagarde R, Ponton D, Powder KE, Schoenfuss HL, Walker JA, Blob RW; Clemson Univ, Univ Perpignan Via Domitia, Univ La Réunion, St Cloud State Univ, Univ Southern Maine*	Linking morphology, performance, and behavior in the migration of stream goby fishes

12:00 pm **Lunch Break**

10:15 AM – 12:00 PM **Session 51** **Lone Star F**

Neuroethology & Visual Sensing

Chair: Clement Vinauger

10:15 am	**51-1**	*Wynne NE, Fryzlewicz LH, Vinauger C; Virginia Polytechnic Institute and State University*	Navigating Towards Defensive Hosts: Mosquito Visual Avoidance Behavior
10:30 am	**51-2**	*Chappell DR, Speiser DI; University of South Carolina*	Neural processing in distributed visual systems – many eyes, many solutions
10:45 am	**51-3**	*Feller KD, Supple J, Gonzalez-Bellido PT; Univ of Minnesota, Univ of Cambridge*	Multimodal sensory responses from descending neurons in Squilla stomatopod crustaceans

11:00 am	**51-4**	*Palermo NA, Siddiqui SG, Theobald JC; Florida International University*	*Drosophila melanogaster* uses its regional attention to maxamize spatial information during flight.
11:15 am	**51-5**	*Moon H, Anderson T, Travers M, Loew E, Porter M; University of Hawaii at Manoa, Kauai Endangered Seabird Recovery Project, Cornell University*	How Do Seabirds See Light? Visual sensitivity and light attraction in Hawaiian seabirds
11:30 am	**51-6**	*Chandrasegaran K, Wynne N, Vinauger C*; Virginia Tech*	Visual Avoidance Behavior in Mosquito Larvae and Adults
11:45 am	**51-7**	*Ruiz CA, Theobald JC; Florida International University*	Fruit Flies Respond to Ventral Parallax During Strong Sideslip Disturbances

12:00 pm ..... **Lunch Break** .....

10:15 AM – 12:00 PM **Session 52** **Lone Star G**

Getting Real: Effects of Multiple Stressors on Organisms

Chairs: John VandenBrooks, Carrie Coy

10:15 am	**52-1**	*Padda SS, Johnson DJ, Glass JR, Stahlschmidt ZR; U Pacific, Ariz State U*	Alter Investment or Conserve? Assessing animal strategies to limit costs from concurrent weather extremes
10:30 am	**52-2**	*Vandenbrooks JM, Vimmerstedt J, Huffaker M, Angilletta M; Midwestern University, Arizona State University*	Oxygen limits the thermal tolerance in embryos of terrestrial endothermic and ectothermic animals
10:45 am	**52-3**	*Ackerly KL, Esbaugh AJ; University of Texas at Austin*	Impacts of temperature acclimation and oil exposure on aerobic performance in red drum, *Sciaenops ocellatus*
11:00 am	**52-4**	*McTernan MR, Sears MW; Clemson University*	Thermal and hydric balance: how salamanders respond to interacting stressors
11:15 am	**52-5**	*Rennolds CW, Bely AE; University of Maryland*	Injury improves short-term environmental stress tolerance in a freshwater annelid
11:30 am	**52-6**	*Berlow M, Phillips JN, Derryberry EP; University of Tennessee, California Polytechnic State University*	Effects of Urbanization and Landscape on Wild Avian Gut Microbiomes
11:45 am	**52-7**	*Coy CO, Moore PA, Belanger RM, Newcomb TJ; Bowling Green State University, University of Michigan Biological Station, University of Detroit-Mercy, Michigan Department of Natural Resources*	Perfluoroalkyl Substances in Bluegill (*Lepomis macrochirus*) and Their Relationship to Histology and Swimming Performance

12:00 pm ..... **Lunch Break** .....

10:30 AM – 11:45 AM **Session 53** **Rooms 301-302**

Immune-based Tradeoffs

Chairs: Matthew Steffenson, Emily Cornelius Ruhs

10:30 am	**53-1**	*Vargas R, Valentini A, Garcia M, Steffenson M; St Edward's University*	The Immunological Response of Leg Autotomy in *Tigrosa helluo* Involving Hemocyte Protein Analysis
10:45 am	**53-2**	*Chang Van Oordt DA, Taff CC, Ryan TA, Vitousek MN; Cornell University*	Raising Defenses: Are There Costs to Stronger Immunity in Breeding Tree Swallows?
11:00 am	**53-3**	*Moreno KR, Weinberg M, Yovel Y, Harten L, Czirják SL, Salinas-Ramos VB, Herrera Montalvo LG; Tel Aviv University, Leibniz Institute for Zoo and Wildlife Research, University of Naples Federico II, Universidad Nacional Autónoma de México*	Sickness in Fruit Bats: Unique Immune Reaction Reflects a Unique Social Behavior
11:15 am	**53-4**	*Hudson SB, Virgin EV, Smith GD, Brodie Jr. ED, French SS; Utah State University, Dixie State University*	Energetic strategy, oxidative cost, and performance outcome vary according to magnitude of an integrative immune challenge
11:30 am	**53-5**	*Steffenson M, Garcia M, Valentini A, Vargas R; St Edward's University*	The Effect of Elevated Temperature on Basal Immunological Activity in The Wolf Spider *Tigrosa helluo*

11:45 am ..... **Lunch Break** .....

10:15 AM – 12:00 PM **Session 54** **Room 205**

Adaptation and Genes

Chairs: Jennifer Kovacs, Zac Cheviron

10:15 am	**54-1**	*Schweizer RM, Jones MR, Bradburd GS, Wolf CJ, Senner NR, Storz JF, Cheviron ZA*; University of Montana, Michigan State University, University of South Carolina, University of Nebraska*	Genomic signatures of selection across the oxygen transport cascade in high-altitude deer mice
10:30 am	**54-2**	*Kovacs JL, Werren J; Spelman College, University of Rochester*	Horizontal Gene Transfer as a Mechanism for Convergent Evolution in Arthropods
10:45 am	**54-3**	*Coffin JL, Kelley JL, Tobler M; Kansas State University, Washington State University*	Adaptation to Life in Acid Mine Drainage: Transcriptomics and Molecular Evolution in Western Mosquitofish
11:00 am	**54-4**	*Oliveira DR, Foster SA, Fitzpatrick SW; Clark University, Michigan State University*	Integrating Phenotypes and Genomes in a Fine-Scale Study of Lake-Stream Divergent Rainbow Darters
11:15 am	**54-5**	*Balchan NR, Mackessy SP; University of Northern Colorado*	Venom Resistance in an Eastern Colorado Rodent Community
11:30 am	**54-6**	*Holding ML, Strickland JL, Rautsaw RM, Mason AJ, Hofmann EP, Hogan MP, Colston TJ, Nystrom G, Grazziotin F, Gibbs HL, Rokyta DR, Parkinson CL; Florida State University, Clemson University, Instituto Butantan, Ohio State University CL*	Comparative analysis of venom complexity and diet diversity in rattlesnakes using a novel, genome-wide phylogeny
11:45 am	**54-7**	*Guerra Canedo VI, Hart MW, Koepfli KP; Simon Fraser University, Smithsonian Conservation Biology Institute*	Evidence of positive selection in genes known to regulate fertilization in Mustelids

12:00 pm **Lunch Break**

10:30 AM – 12:00 PM **Session 55** **Rooms 201-202**

Growth Factors & Neuropeptides

Chairs: Kendra Sewall, Elizabeth Addis

10:30 am	**55-1**	*Sewall KB, Davies S, Beck ML; Virginia Tech, Quinnipiac University, Rivier University*	Relationships Among Neuropeptides, Territorial Aggression, and Urbanization in Male Song Sparrows
10:45 am	**55-2**	*Beatty AE, Schwartz TS; Auburn University*	We need to talk...about IGF2: A cross-species comparison of IGF1 and IGF2 expression in amniotes.
11:00 am	**55-3**	*Addis AE, Janzen FJ, Bronikowski AM; Gonzaga University, Iowa State University*	A Role of Insulin-Like Growth Factors in Mediating Trade-Offs Between Growth and Reproduction in Painted Turtles
11:15 am	**55-4**	*He L, Shin SHJ, Wang Z, Yuan I, Weschler R, Koyama T, Nijhout HF, Suzuki Y*; Wellesley College, University of Copenhagen, Duke University*	Body size sensing in the tobacco hornworm, *Manduca sexta*: the role of TGF-beta/Activin signaling in metamorphic timing
11:30 am	**55-5**	*Cordova KL, Bersin TV, Saenger EK, Journey ML, Beckman BR, Lema SC; Cal Poly, San Luis Obispo, Northwest Fisheries Science Center*	Opposing influences of fasting stress and Igf1 on skeletal muscle gene pathways for Igf-signaling and myofibrillar protein degradation in gopher rockfish
11:45 am	**55-6**	*Marks JR, Sorlin MV, Lailvaux SP, Schwartz TS, Beatty AE; University of New Orleans*	Effect of Diet Restriction on Insulin-like Growth Factor 1 and 2 Expression in Female Green Anoles (*Anolis carolinensis*)

12:00 pm **Lunch Break**

10:00 AM – 12:00 PM **Session 56** **Rooms 203-204**

Beat it (the Heat)- Combating Stress in Coral Reefs, Part I

Chair: Nicola Kriefall

10:00 am	**56-1**	*Aichelman HE, Bove CB, Castillo KD, Boulton JM, Knowlton AC, Nieves OC, Ries JB, Davies SW; Boston University, UNC Chapel Hill, Northeastern University*	Time Course Physiology of Caribbean Corals Reveals Divergent Responses to Global Change Stressors
10:15 am	**56-2**	*Zhang Y, Barnes SJ, Kenkel C; University of Southern California*	Familial effects on the thermal tolerance of the brooding coral *Porites astreoides* during early life stages
10:30 am	**56-3**	*Correa AMS, Grupstra CGB, Howe-Kerr LI, Veglia AJ, Bryant RL, Conetta D; Rice University, University of Rhode Island*	Viral Reefscapes: Microbial Interactions with Threatened Coral Hosts and Reef Ecosystems

10:45 am	**56-4**	*Kriefall NG, Matz MV, Kanke M, Davies SW; Boston University, UT Austin, Cornell University*	Symbiotic partners diverge across reef environments in a panmictic coral population
11:00 am	**56-5**	*Abbott EA, Dixon GB, Matz MV; University of Texas*	Disentangling coral stress and bleaching responses by comparing gene expression in symbiotic partners
11:15 am	**56-6**	*Reich HG, Rodriguez IB, Tripp SE, Warner ME, Kemp DW, Ho TY, Lajeunesse TC; Penn State Univeristy, University of the Philippenes, University of Delaware, University of Alabama at Birmingham, Academia Sinica*	Symbiotic dinoflagellates pump iron (and other trace metals) to beat the heat
11:30 am	**56-7**	*Matsuda SB, Chakravarti LJ, Cunning JR, Van Oppen MJH, Gates RD; Hawaii Institute of Marine Biology, Australian Institute of Marine Science, Shedd Aquarium*	Coral (*Acropora tenuis*) background symbiont, *Gerakladium*, competes with *Durusdinium* as dominant symbiont at elevated temperatures in multiple-genus symbiont-choice
11:45 am	**56-8**	*Benson BE, Aichelman HE, Baumann JH, Nieves OC, Stanizzi DA, Castillo KD, Davies SW*; Boston University, UNC CH*	Diel thermal variation supports growth and symbiosis in a reef-building coral

12:00 pm **Lunch Break**

10:15 AM – 12:00 PM **Session 57** **Brazos**

Special Session: Celebrating the Scientific Contributions of Rosemary Knapp: Hormones and Alternative Reproductive Tactics, Part II

Chairs: Sarah Woodley, Ignacio Moore

10:15 am	**57-1**	*Hews D, Lisiüiè D, Glogoå Ki M, Blaževiè SA, Hraniloviè D; Indiana State Univ, Univ Zagreb*	Behavior and Neuroendocrine Differences in Island and Mainland Populations of Wall Lizards (*Podarcis sicula*): Do They Mirror Typical Within-Population Variation in Stress-Coping Styles?
10:30 am	**57-2**	*Maney DL; Emory University*	Evolution of alternative behavioral phenotypes: A story of genes and bird brains
10:45 am	**57-3**	*Thaker M, Batabyal A, Amdekar M; Indian Institute of Science*	Alternative strategies and the dynamism of color
11:00 am	**57-4**	*Pradhan DS, Grober MS, White KJ; Idaho State University, Georgia State University*	Onset and maintenance of male-typical parenting behavior during protogynous sex change
11:15 am	**57-5**	*Gabor CR, Aspbury AS, Ujhegy N, Bókony V; Texas State University, Plant Protection Institute Centre for Agricultural Research*	Environmental Variation From Land Use Conversion Affects Stress in Tadpoles
11:30 am	**57-6**	*Forlano PM; CUNY Brooklyn College, CUNY Graduate Center*	Evidence for Monoamines as Neurochemical Substrates Underlying Alternative Reproductive Tactics
11:45 am	**57-7**	*Bonier F, Cox RM; Queen's University, University of Virginia*	To each their own? Meta-analysis of evidence of optimality of endocrine phenotypes

12:00 pm **Lunch Break**

10:15 AM – 11:30 AM **Session 58** **Rooms 402-403**

Evo-devo

Chair: Arkhat Abzhanov

10:15 am	**58-2**	*Tews VH, Barnett AA; DeSales University*	Examining the Evolution of Epidermal Growth Factor (EGF) Pathway Ligands in Insects
10:30 am	**58-3**	*Zakas C, Rockman M; North Carolina State University, New York University*	How Maternal Genetic Effects Shape Developmental Evolution
10:45 am	**58-4**	*Lopez Juarez J, Ventura D, Zhang L, Davidson BJ; Swarthmore College*	Developmental systems drift in tunicate neural gene regulatory elements
11:00 am	**58-5**	*Abzhanov A; Imperial College London, Natural History Museum*	Phylogenetic Principles and Morphogenetic Mechanisms for Evolvability in Adaptive Radiations
11:15 am	**58-6**	*Long JH, Aaron E, Livingston K, Hawthorne-Madell J; Vassar College, Colby College*	Evo-Devo Biorobotics: Masquerading Genomes and the Mapping of Genotype to Phenotype in Embodied Agent Models

11:30 am **Lunch Break**

Sunday Program Afternoon Sessions

Note: Presenter is first author unless noted by an asterisk (*).

1:30 PM – 3:00 PM **Session 59** **Lone Star A**

Complementary to S1: New Frontiers in Antarctic Marine Biology

Chairs: Brad Seibel, Prashant P. Sharma

1:30 pm	**59-2**	*Toh MWA, Lobert GT, Moran AL; University of Hawai'i at Mānoa*	Thermal Sensitivity of Early Life History Stages of Antarctic Invertebrates
1:45 pm	**59-4**	*Bierlich KC, Dale JD, Friedlaender AS, Goldbogen JA, Johnston DJ; Duke University, University of California Santa Cruz, Stanford University*	Dwarf minke whales along the Antarctic Peninsula: Evidence of climate migration or historic misidentification?
2:00 pm	**59-5**	*Tarrant AM, Berger C, Steinberg DK; Woods Hole Oceanogr Inst, Virginia Inst Marine Sci*	Feast and Famine: Copepod metabolic condition during summer along the West Antarctic Peninsula
2:15 pm	**59-6**	*Costa DP, Kienle SS, Trumble SS, Kanatous S, Goebel ME, Borras R, Crocker DE; University of California at Santa Cruz, Baylor University, Colorado State University, National Marine Fisheries Service-NOAA, Chilean Antarctic Program, Sonoma State University*	Foraging Behavior and Movement Patterns of the Leopard Seal in the Antarctic Peninsula
2:30 pm	**59-7**	*Rix AS, O'Brien KM; University of Alaska Fairbanks, Institute of Arctic Biology*	Characterizing the Hypoxia-Inducible Factor-1 Pathway in Response to Acute Thermal Stress and Hypoxia in Antarctic Notothenioid Fishes
2:45 pm	**59-8**	*Sharma PP, Arango CP, Ballesteros JA, Brenneis G, Dilly GF, Setton EVW, Wheeler WC; University of Wisconsin-Madison, Queensland Museum, University of Greifswald, California State University-Channel Islands, American Museum of Natural History*	Phylogenomic resolution of sea spider relationships via integration of phylogenetic data classes

3:00 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:30 PM **Session 60** **Lone Star B**

The Biology Underground

Chairs: Ben McInroe, Kory Evans

1:30 pm	**60-1**	*McInroe BW, Bolas T, Ko I, Full RJ; UC Berkeley*	Reconfigurable control modules enable rapid burrowing in a decapod crustacean
1:45 pm	**60-2**	*Murray-Cooper M, Ozkan-Aydin Y, Aydin E, Naclerio N, McCaskey EN, Hawkes E, Goldman DI; Georgia Tech, UC Santa Barbara*	Robophysical Investigation of Root Nutation through Heterogeneous Environments
2:00 pm	**60-3**	*Katz HR, McCarthy NA, Fouke KE, Morgan JR; Marine Biological Laboratory, Carthage College*	Functional Recovery of Burrowing Behavior in Sea Lampreys After Spinal Cord Injury
2:15 pm	**60-4**	*Evans KM, Sperstad ZE, Westneat MW; Brown University, University of Minnesota, University of Chicago*	Evolutionary Convergence and Constraints on the Skull Shape of Burrowing Wrasses
2:30 pm	**60-5**	*Gurgis GP, Daza JD, Brennan IG, Hutchinson M, Bauer AM, Olori JC; SUNY Oswego, Sam Houston State University, Australian National University, South Australian Museum, Villanova University*	Using your head! Finite Element Analysis of head-first burrowing Pygopodids (Gekkota)
2:45 pm	**60-6**	*Carruthers Ferrero A, Ozkan-Aydin Y, Goldman DI; Georgia Tech*	Lateral bending and buckling aids earthworm locomotion in confined environments
3:00 pm	**60-7**	*Diaz K, Wang T, Chong B, Ding JL, Lu H, Sartoretti G, Choset H, Goldman DI; Georgia Tech, Carnegie Mellon*	Steering Behaviors of *C. elegans* Locomotion in Heterogeneous Environments
3:15 pm	**60-8**	*Scibelli AE, Trimmer BA; Tufts University*	A bioinspired compressible soft robot for studying terrestrial crawling

3:30 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 2:45 PM **Session 61** **Lone Star C**

Special Session: Digestive Physiology: A Session in Honor of Bill Karasov, Part II

Chairs: Kevin Kohl, Denise Dearing

1:30 pm	**61-1**	*Hammond KA, Dolan JE, Sawaya M; University of California Riverside*	Deer Mouse Lungs as Flexible Environmental Interfaces
1:45 pm	**61-2**	*Caviedes-Vidal E, Brun A, Magallanes ME, Barret-Wilt GA, Karasov WH; Consejo Nacional de Investigaciones Científicas y Técnicas, Universidad Nacional de San Luis, University of Wisconsin-Madison*	Dietary Adaptation to High Starch Involves Increased Abundance of Î±-Glucosidase and its mRNA
2:00 pm	**61-3**	*Carey HV, Regan MD, Chiang E, Suen G, Assadi-Porter F; University of Wisconsin-Madison*	Stable Isotope Assisted Labeling Reveals Seasonal Influence on Microbial Metabolite Incorporation in Ground Squirrels
2:15 pm	**61-4**	*McWhorter TJ; University of Adelaide*	The Karasov effect: functional studies of nutrient absorption in endotherms at the extreme
2:30 pm	**61-5**	*Dearing MD; University of Utah*	Mechanisms of detoxification in herbivorous mammals

2:45 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:15 PM **Session 62** **Lone Star E**

Animals in Compliance: Structural Mechanics

Chairs: Ruijie Zhu, Janne Pfeiffenberger

1:30 pm	**62-1**	*Seth D, Lauder GV, Flammang BE, Tangorra JL; Villanova University, Harvard University, New Jersey Institute of Technology, Drexel University*	Fish Fin Compliance: A Perturbation Technique to Determine Compliance During Free Swimming
1:45 pm	**62-2**	*Zhu R, Matthews DG, Wang J, Lauder GV, Dong H, Bart-Smith H; University of Virginia, Harvard University*	Effects of Peduncle Stiffness on Propulsive Performance of Tuna-shaped Panel
2:00 pm	**62-3**	*Pfeiffenberger JA, Tytell ED; Tufts University*	Active muscular changes in the effective mechanical properties of fish bodies
2:15 pm	**62-4**	*Struble MK, Gardner J, Gibb AC; Northern Arizona University, Montana State University*	Grasping Behavior in Birds Drives Pedal Adaptations
2:30 pm	**62-5**	*Baliga VB, Szabo I, Altshuler DL; University of British Columbia*	Examining the evolution of range of motion helps resolve gaps between form and function in the avian wing
2:45 pm	**62-6**	*Munteanu VD, Diamond KM, Mayerl CJ, Blob RW; Clemson University, NEOMED*	Humeral Strains During Climbing in Green Iguanas: Testing Biomechanical Release as a Mechanism Promoting Morphological Transitions in Arboreal Vertebrates
3:00 pm	**62-7**	*Kawano SM, Blob RW; George Washington Univ, Clemson Univ*	Evaluating limb bone stresses of early tetrapods in the context of the evolutionary invasion of land

3:15 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:15 PM **Session 63** **Lone Star F**

DAB Best Student Paper: Marlene Zuk Award

Chairs: Scott MacDougall-Shackleton, Erica Westerman

1:30 pm	**63-1**	*Yang Y, Richards-Zawacki CL; University of Pittsburgh*	Male Contest Limits Assortative Female Preference in a Color Polymorphic Poison Frog
1:45 pm	**63-2**	*Naisbett-Jones L, Tsai E, Lohmann C, Lohmann K; University of North Carolina, Chapel Hill*	Navigating the Ocean Floor: Magnetic Compass Orientation of a Marine Flatfish
2:00 pm	**63-3**	*Mitchem LM, Vilella-Pacheco Z, Formica VA, Brodie III ED; University of Virginia, University of Puerto Rico - Arecibo, Swarthmore College*	Females Prefer to Associate with the Chemical Cues of Aggressive, Winning Males After Competition
2:15 pm	**63-4**	*Goforth KM, Lohmann CMF, Lohmann KJ; University of North Carolina at Chapel Hill*	The Role of Magnetic Field Detection in Foraging Site Fidelity of Sea Turtles
2:30 pm	**63-5**	*Emberts Z, St. Mary CM, Forthman M, Miller CW; University of Florida*	The evolution of autotomy in leaf-footed bugs

2:45 pm	**63-6**	*Dinh JP, Azza J, Patek SN; Duke University*	Assessing Your Opponent: Snapping Shrimp Use Indirect Cues to Settle Ritualized Contests
3:00 pm	**63-7**	*Brass KE, Herndon N, Gardner S, Grindstaff J, Campbell P; Oklahoma State University, University of California, Riverside*	Epigenetic effects of paternal perception of predation risk on offspring phenotypes

3:15 pm ..... **Coffee Break** ..... **Grand Ballroom**

1:30 PM – 3:15 PM **Session 64** **Lone Star G**

You Got the Touch (and Sight and Sound)

Chair: Simon Walker

1:30 pm	**64-1**	*Maeda M, Walker SM, Fabian JM, Lin HT, Bomphrey RJ; Royal Veterinary College, University of Leeds, Imperial College London*	Aerodynamic and Structural Modelling and Simulation of Dragonfly Wing: Towards the Understanding of "Fly-by-Feel"
1:45 pm	**64-2**	*Walker SM, Christen P, Taylor GK; University of Leeds, University of Applied Sciences and Arts Northwestern Switzerland, University of Oxford*	Haltere kinematic and dynamics measured using time-resolved microtomography
2:00 pm	**64-3**	*Sharma VP, Sponberg SN; Georgia Institute of Technology*	Context Dependent Sensing and Robust Integration of Visual and Mechanosensory Stimuli in Hover-Feeding Hawk Moths
2:15 pm	**64-4**	*Mekdara PJ, Nasimi F, Tytell ED; Tufts University*	Sensorimotor integration in the control of dorsal fin movements during swimming
2:30 pm	**64-5**	*Christensen BA, Schwaner MJ, Freymiller GA, Clark RW, McGowan CP; University of Idaho, San Diego State University*	Exploring Reaction Time in Desert Kangaroo Rats
2:45 pm	**64-6**	*Kemp AK; Duke University*	Effects of binocular field size on leaping performance in small bodied primates
3:00 pm	**64-7**	*Deleo DM, Bracken-Grissom HD; Florida International University*	The Largest Migration on Earth: Sensory Adaptations of a Bioluminescent Deep-sea Vertical Migrator

3:15 pm ..... **Coffee Break** ..... **Grand Ballroom**

1:30 PM – 3:15 PM **Session 65** **Rooms 301-302**

Education and External Partnerships

Chairs: Nicoline Chambers, Sebastian Echeverri

1:30 pm	**65-1**	*Echeverri SA, Wetzel DP, Brouwer NL; University of Pittsburgh*	De-Jargonizing SciComm: Does having to use simple words make students better at writing for most people?
1:45 pm	**65-2**	*Chambers NM, Williams CM; West High School, University of California, Berkeley*	The Beetle Project: Bringing Authentic Research Into High School Classrooms
2:00 pm	**65-3**	*Taylor LD, White LD; University of California, Berkeley*	Building Collaborations with Local Community Colleges to Increase Diverse Students' Access to STEM Fields
2:15 pm	**65-4**	*Hawkins RK, Stocker MR, Metzgar JS; Virginia Tech*	The Importance of Natural History Collection Clubs in Preserving and Using University Collections
2:30 pm	**65-5**	*Tran MV, Miller A, Odaka Y, Owen P, Wilson K; University of Cincinnati Blue Ash College*	Designing Multifaceted Research Experiences for Undergraduates in Integrative Biology
2:45 pm	**65-6**	*Woodley SK, Cascio M, Kolber BJ, Mihailescu MR, Tidgewell KJ; Duquesne University*	Community-engaged Learning in a Summer Undergraduate Research Program
3:00 pm	**65-7**	*Seth D; Villanova University*	Development of an Interactive Model of a Snake Jaw for Natural and Applied Science Education

3:15 pm ..... **Coffee Break** ..... **Grand Ballroom**

1:30 PM – 3:15 PM **Session 66** **Room 205**

Thermoregulation

Chairs: Victoria Dahlhoff, Michael Dillon

1:30 pm	**66-1**	*Cooper C, Keeling E, Liwanag H; California Polytechnic State University*	Feeling out your Food: A histological analysis of the vibrissal system in pinnipeds
1:45 pm	**66-2**	*Dillon ME, Petranek C; University of Wyoming*	Induced flow cools hovering bumble bees
2:00 pm	**66-3**	*Talbot WA, Wolf BO; University of New Mexico*	Sonoran desert bats show modest capacities for thermoregulation in the heat
2:15 pm	**66-4**	*Franklin CE; University of Queensland*	Unravelling the reptilian thermoregulatory paradigm
2:30 pm	**66-5**	*Dahlhoff VC, Larkin B, Woods HA; University of Montana*	Capturing behavioral thermoregulation in the western tent caterpillar *Malacosoma californicum pluviale* using thermal imaging
2:45 pm	**66-6**	*Sun BJ, Huebner C, Treidel LA, Clark R, Roberts KT, Williams CM*; Chinese Academy of Sciences, University of California, Berkeley, Sienna College*	Integrated behavioral and physiological strategies allow *Gryllus lineaticeps* crickets to fly on cool nights
3:00 pm	**66-7**	*Crowell HL, Taylor EN; University of Michigan, California Polytechnic State University*	Comparative Thermal Ecology of Coastal and Inland Populations of Pacific Rattlesnake *Crotalus oreganus*

3:15 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:00 PM **Session 67** **Rooms 201-202**

Molecular Evolution

Chair: Sally Chang

1:30 pm	**67-1**	*Chang ES, Gonzalez P, Schnitzler CE, Baxevanis AD; NHGRI/NIH, U Florida*	Diverse patterns of human disease gene emergence and loss across the Metazoa
1:45 pm	**67-2**	*Weber AC, Guibinga Mickala A, Lighten J, Van Oosterhout C, Abernethy KA, Ntie S, Mickala P, Lehmann D, Anthony NM; University of New Orleans, Université des Science et Techniques de Masuku, University of Exeter, University of East Anglia, University of Stirling, Agence Nationale des Parcs Nationaux du Gabon*	Characterizing the class II major histocompatibility complex in wild mandrills
2:00 pm	**67-3**	*Tassia MG, David KT, Halanych KM; Auburn University*	Innate immunity evolution in underrepresented metazoans and the implications when opting for similarity-metrics vs. hidden Markov models
2:15 pm	**67-4**	*Jarman MJ, Hill EC, Butler MA; University of Hawaii, Honolulu*	When You Need a Miracle: Amplifying and Sequencing Degraded DNA Through Touchdown and Nested PCR Techniques.
2:30 pm	**67-5**	*Russell A, Borrelli S, Fontana R, Laricchiuta J, Pascar J, Becking T, Giraud I, Cordaux R, Chandler CH*; SUNY Oswego, Syracuse University, Université de Poitiers*	A Transition to XY Sex Chromosomes Associated with Y-linked Duplication of a Male Hormone Gene in a Terrestrial Isopod
2:45 pm	**67-7**	*Scepanovic J, Kolchenko S, Plessier F, Lowe C, Spitz F, Marlow H; University of Chicago, Pasteur Institute, École normale supérieure, Sorbonne Université, Stanford University*	Modularity in Gene Regulation: Evolution of Combinatorial Cis-Regulatory Inputs

3:00 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:00 PM **Session 68** **Rooms 203-204**

Beat it (the Heat) – Combating Stress in Coral Reefs, Part II

Chair: Rachel Wright

1:30 pm	**68-1**	*Wright RM, Nuttall M, Davies SW; Smith College, Flower Garden Banks National Marine Sanctuary, Boston University*	Gene Expression in Response to Experimental Low Dissolved Oxygen Supports the Hypothesis that Hypoxia Contributed to a Natural Coral Mortality Event

1:45 pm	**68-2**	*Poole AZ, Bailey GF; Berry College*	GTPases of Immunity Associate Proteins (GIMAP) gene expression in response to induction of apoptosis and autophagy in the sea anemone *Exaiptasia pallida*
2:00 pm	**68-3**	*Wall CB, Ritson-Williams R, Popp BN, Gates RD; University of Hawai'i at Mānoa, California Academy of Sciences, Hawai'i Institute of Marine Biology*	Spatial variation in biochemical and isotopic composition of corals during bleaching and recovery
2:15 pm	**68-5**	*Shore A, Sanders K, Conetta D, Correa AMS; Rice University*	Hypoxia and coral microbiomes: Linking field and experimental data
2:30 pm	**68-6**	*Bove CB, Davies SW, Ries JB, Umbanhowar J, McCoppin J, Farquhar E, Castillo KD; UNC-Chapel Hill, Boston University, Northeastern University*	Physiological and transcriptomic responses of coral hosts and algal symbionts of four Caribbean corals under global change
2:45 pm	**68-7**	*Drew JA, McKeon MG; State University of New York College of Environmental Science and Forestry, Columbia University*	Shark-based tourism presents opportunities for facultative dietary shift in coral reef fish

3:00 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:15 PM **Session 69** **Brazos**

DCE Best Student Paper - Aubrey Gorbman Award

Chairs: Loren Buck, Kathleen Hunt

1:30 pm	**69-1**	*Crain DD, Usenko S, Mansouri F, Winfield ZC, Zerbini AN, Gabriele C, Sabin R, Potter C, Trumble SJ; Baylor University, Marine Mammal Laboratory, Glacier Bay National Park and Preserve, Natural History Museum, Smithsonian Institution*	A Different Kind of Wax Museum: Forecasting Population Trajectories of Baleen Whales Using Reproductive Parameters From Earplugs.
1:45 pm	**69-2**	*Munley KM, Deyoe JE, Adaniya CH, Nowakowski AM, Ren CC, Murphy GV, Reinhart JM, Demas GE; Indiana University*	Melatonin modulates seasonal changes in neurosteroid levels and territorial aggression in male Siberian hamsters (*Phodopus sungorus*)
2:00 pm	**69-3**	*Gormally BMG, Estrada RS, McVey M, Romero LM; Tufts University*	Expanding the acute stress phenotype: DNA damage rapidly increases in house sparrows
2:15 pm	**69-4**	*Khalil S, Enbody ED, Welklin JF, Schwabl H, Webster MS, Karubian J; Tulane U, Uppsala U, Cornell U, WSU*	Testosterone Regulates Gene Expression Associated with Carotenoid-Based Plumage Ornamentation in the Red-backed Fairywren
2:30 pm	**69-5**	*Lane SJ, Emmerson MG, Vandiest IJ, Hucul C, Beck ML, Davies S, Gilbert ER, Sewall KB; Virginia Tech, Rivier University, Quinnipiac University*	Urbanization lowers hippocampal glucocorticoid receptor expression but not clearance of glucocorticoids in male Song Sparrows.
2:45 pm	**69-6**	*Giglio EM, Tripp JA, Phelps SM; University of Texas at Austin*	The role of leptin in social signal decisionmaking in neotropical singing mice (*Scotinomys teguina*)
3:00 pm	**69-7**	*Boersma J, Jones JA, Karubian J, Schwabl H; Washington State University, Tulane University*	Sex-specific causes and consequences of variable testosterone circulation in a tropical songbird

3:15 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:15 PM **Session 70** **Rooms 402-403**

Sensory Biology & Neuroethology

Chair: Alex Kingston

1:30 pm	**70-1**	*Wardill TJ, Feord RC, Sumner ME, Pusdekar S, Kalra L, Gonzalez-Bellido PT; University of Minnesota, University of Cambridge*	Binocular stereopsis in cuttlefish improves prey targeting.
1:45 pm	**70-2**	*Johnsen S, Caves EM; Duke Univ, Exeter Univ*	How our perceptual and cognitive biases may influence our study of animal vision
2:00 pm	**70-3**	*Palavalli-Nettimi R, Theobald JC; Florida International University*	Light intensity and eye size dependent spatio-temporal visual abilities in *Drosophila melanogaster*
2:15 pm	**70-4**	*Kingston ACN, Speiser DI; University of South Carolina*	Snapping shrimp see through transparent armor

2:30 pm	**70-5**	*Schweikert LE, Davis AL, Johnsen S, Bracken-Grissom HD; Florida International University, Duke University*	Vision and Bioluminescence in Deep-sea Shrimps: Implications for Conspecific Recognition
2:45 pm	**70-6**	*Heesy CP; Midwestern University*	On the Laws of Haller and Leuckart OR Does visual resolution scale with velocity and size in animals?
3:00 pm	**70-7**	*Brady PC, Garcia M, Hernandez T, Aalund M, Gruev V, Cummings ME; University of Texas at Austin, University of Illinois at Urbana Champaign*	Measurement of cephalopod polarization patterns with color video-polarimetry and computer vision techniques.
3:15 pm		**Coffee Break**	**Grand Ballroom**

7:00 PM – 8:00 PM	**AMS Lecture**	**Rooms 301-302**
AMS Lecture	*Lindsay SM; University of Maine*	The Art of Seeing: Using Microscopy to Power STEAM Learning in Biology

7:00 PM – 8:00 PM	**BERN Lecture**	**Salons D-E**
BERN Lecture	*Bentley GE; UC Berkeley*	A Bird's Eye View of Reproductive Endocrinology

Sunday POSTER SESSION P2

Grand Ballroom, 3:30-5:30 PM

Poster Set Up: 7:00-8:00 am; Poster Teardown: 5:30-6:00 pm

Even # - Authors present from 3:30-4:30 pm; Odd # - Authors present from 4:30-5:30 pm

DIZ BSP: Alan Kohn Award

P2-1	*Sidebottom RB, Martin GG; Occidental College*	Is That a Basal Lamina Lining the Open Circulatory System of a Shrimp?
P2-2	*Glover AR, Brannock PM; Rollins College*	Genetic analysis of invasive *Pomacea* sp. in Florida
P2-3	*Pierce ER, Geller JB; Moss Landing Marine Laboratories*	Molluscan Waste is not a Load of Crap: Comparing Environmental DNA Accumulation and Degradation Rates from Mussels, Limpets, and Abalone
P2-4	*Powers MM, Ellison C, Madrid M, Rodríguez L, Maslakova S; University of Iowa, University of Oregon, Smithsonian Tropical Research Institute*	Nemertean diversity in Colón, Panama assessed by DNA-barcoding
P2-5	*Lownds BI, Topping NE, Jost JA; Bradley University*	The Effect of Clumping Behavior on the Survival, Growth, and Cellular Physiology of the Zebra Mussel (*Dreissena polymorpha) in a Central Illinois Population*
P2-6	*Caine PB, Gibson JD; Bucknell University, Georgia Southern University*	Colony Recognition and Aggression in Invasive Argentine Ants (*Linepithema humile)of Georgia*
P2-7	*Johnson LE, Treible LM; Trinity University, Georgia Southern University*	Synergistic Effects of UVA and UVB Radiation on Moon Jellyfish Proliferation and Potential Coping Mechanisms
P2-8	*Topping NE, Jost JA; Bradley University Peoria Il*	Investigating the seasonal patterns of zebra mussel (*Dreissena polymorpha*) growth and physiology using field enclosures in central Illinois
P2-9	*Peterson BN, Yeo AC, Allen JD; William & Mary*	Attack of the Clones: Examining the Factors that Influence Cloning in Echinoderm
P2-10	*Hannon MC, Hilliard J, Garbuglio De Oliveira A, Schulze A; Texas A&M University, University of São Paulo*	Annelid Bioluminescence: The Search for Luciferases in Annelid Trancriptomes
P2-11	*Breen CJ, Cahill AE; Albion College*	Survivability and Reproduction in *Daphnia*, Copepods, and Ostracods Under Changing Salinities
P2-12	*Yeo AC, Richardson EL, Deaker D, Garcia A, Byrne M, Allen JD; William and Mary, Monash University, University of Sydney, Université Libre de Bruxelles*	Effects of gamete age on development in broadcast spawning marine invertebrates
P2-13	*Ritmeester-Loy SA, Martin GG, Appy R; Occidental College*	A Trypanorhynch Cestode in Shrimp and Skates: Morphology and Partial Life Cycle
P2-14	*Varney RM, Kingston ACN, Kocot KM, Speiser DI; Univ of Alabama, Univ of S Carolina*	Localized physiological changes regulate the biomineralization of magnetite in the radula of the chiton *Acanthopleura granulata*
P2-15	*Urban-Gedamke E, Conkling M, Munroe S, McCarthy PJ, Wills PS, Pomponi SA; Florida Atlantic University*	Evaluation of 3-D Cell Culture Methods for Marine Sponges
P2-17	*Curtis MD, McClintock JB; University of Alabama at Birmingham*	Potential impacts of near-future climate-induced ocean warming on the stomach microbiome of the common soft-bottom sea star *Luidia clathrata*
P2-18	*Cline NW, Brothers CJ, Morrow CD, Curtis MD, Anderson SM, Amsler CD, Shilling AJ, McClintock JB; Walla Walla University, University of Alabama at Birmingham, University of South Florida*	Characterizing the Digestive Microbiome of Antarctic Sea Stars
P2-19	*Canaday EJ, Brothers CJ, Smith KE, Amsler MO, Aronson RB, Singh H, McClintock JB; Southern Adventist University, Walla Walla University, University of Exeter, University of Alabama at Birmingham, Florida Institute of Technology, Northeastern University*	Underwater Islands: The Influence of Surrounding Sediment on Dropstone Ecology

P2-20 *Porter NA, Jost JA; Bradley University* Seasonal Variation in Oxidative Stress for Zebra Mussels Exposed to an Acute Thermal Challenge

Species and Speciation

P2-21 *Dohr SD, Hahn KH, Tuffield MS, Ward RS, Boyer SL; Macalester College* New species of New Zealand Mite Harvestmen in the Genus *Aoraki* (Arachnida, Opiliones, Cyphophthalmi, Pettalidae)

P2-22 *McDonnell AJ, Wetreich H, Cantley JC, Jobson P, Martine CT*; Chicago Botanic Garden, Bucknell University, San Francisco State University, Northern Territory Herbarium* *Solanum plastisexum*, an enigmatic new bush tomato from the Australian Monsoon Tropics exhibiting breeding system fluidity.

P2-23 *Spinelli JMC, Huynh AV, Rice AM; Lehigh University* Vocal Learning in Hybrids: How Does Hybridization Affect Call Learning and Learning Biases in Chickadees?

P2-24 *Rice AM, Huynh AV, Spinelli JMC, Roth TC, Taylor SA; Lehigh University, Franklin & Marshall College, University of Colorado Boulder* Effects of hybridization on cognition in chickadees: A common garden approach

P2-25 *Keogh SM, Sietman BE, Johnson NA, Smith CH, Randklev CR, Harris JL, Simons AM; University of Minnesota, MN Depart Nat Resources, US Geological Survey, Baylor University, Texas A&M, Arkansas State University* Species delimitation, phylogeography, and morphology of the North American Mapleleaf (*Quadrula*) freshwater mussels (Bivalvia: Unionidae)

P2-26 *Cobb BA, Gibson JD, Botnaru L; Georgia Southern University* Exploring the lethality of genetic incompatibility in jewel wasp hybrids

Evolutionary Morphology

P2-27 *Tunnell Wilson WT, Jackson K, Jacobs JL, Sekits N, Smith EN; Whitman College, University of Texas at Arlington* Insights into the Evolutionary History of Lamprophiid Snakes from Vertebral Morphology Using Computed Tomography

P2-28 *Law CJ; American Museum of Natural History, UC Santa Cruz* Evolution of carnivoran body plans

P2-29 *Watson SJ, Evans KM; New Mexico Institute of Mining and Technology, Brown Universtiy* Party in the Front, Business in the Back: Mosaic Evolution of Skull Asymmetry in Flatfishes

P2-30 *Carson IR, Hall HR, Kahrl AF, Johnson MA; Trinity University, University of Virginia, Stockholm University* Intraspecific Variation in Lizard Sperm and Testis Morphology

P2-31 *Moore AJ; Stony Brook University* Empty Space & Morphospace: Vertebral Pneumatization is Correlated with Serial Variation in Vertebral Shape

P2-32 *Scanlan LG, Hernandez AI, Schmitz L;, Claremont McKenna, Scripps, and Pitzer Colleges* Eye Size Evolution in Mudskippers and Related Gobiid Fishes

P2-33 *Watanabe J; University of Cambridge* Contingency in the Functional Convergence of the Musculoskeletal System in Wing-propelled Diving Birds

P2-33.5 *Feo TJ, Matloff LY, Lentink D; Smithsonian Natural History Museum, Stanford University* The structure and function of feather microstructures related to silent flight in owls.

P2-34 *Kim LN, Capano JG, Mayerl CJ, Blob RW, Wyneken J, Brainerd EL; Brown University, Northeast Ohio Medical University, Clemson University, Florida Atlantic University* XROMM analysis of pectoral girdle motions during locomotion and ventilation in the loggerhead sea turtle

P2-35 *Crowe-Riddell JM, Pieterman L, Simoes BF, Nankivell JH, Ford M, Ludington A, Allen L, Sanders KL; University of Michigan, University of Adelaide, Venom Supplies* Ontogenetic change in hue and structure of caudal lure reflects dietary shift in Australian death adders (Elapidae)

P2-36 *Picciani N, Musser JM, Oel AP, Garm AL, Arendt D, Oakley TH; University of California Santa Barbara, European Molecular Biology Laboratory, University of Copenhagen* Organ Complexity and Cell History: a Case of Eye Evolution in Cnidaria

P2-37 *Garrick SR, Westneat MW, George AB; University of Chicago* Evolutionary Morphometrics of Body Form and Fin Shape in Sharks

P2-38 *Farjo MN, George AB, Westneat MW; University of Chicago* Tail Wagging or Fin Flapping? Alternative Locomotor Strategies Drive Body and Fin Shape Evolution in the Surgeonfishes

P2-39 *Early CM, Iwaniuk AN, Ridgely RC, Witmer LM; University of Florida, University of Lethbridge, Ohio University* A Quantitative Framework for Inferring Vision-related Neuroanatomy from the Endocasts of Extinct Birds

P2-41 *Byrne MZ, Rosenbloom JE, Bhalodi JA, Gignac PM, Gidmark NJ; Knox College, Vanderbilt University, Oklahoma State University Center for Health Sciences* Reconciling Anatomical and Physiological Models of Feeding Biomechanics Through Evolution in Centrarchid Fishes

P2-42	*Lawson AB, Echols MS, Hedrick BP, Schachner ER; Louisiana State University HSC, Echols Veterinary Services*	Anatomy of the Respiratory System of the African Grey Parrot (*Psittacus erithacus erithacus*)
P2-43	*Thompson ML, McEntire KD; Trinity University*	Color Morph Distribution of Western Ribbon Snakes (*Thamnophis proximus*) in Texas
P2-44	*Kramer L, Collins C, Gignac P, O'Brien H; Holland Hall High School, Sacramento State University, OSU Center for Health Sciences*	Convergence can you hear me? A Phylogenetic Comparative Study of the Conductive Hearing Apparatus of Desert-Adapted Rodents
P2-46	*Stiegler J, Moore AJ, Wang S, Leite JV, Scannella J, Xu X, Clark J; George Washington University, Stony Brook University, University of Southern California, Natural History Museum, Montana State University, Institute of Vertebrate Paleontology and Paleoanthropology*	Homology of an Ossified Metacarpal V in Extant Birds and Mesozoic Theropod Dinosaurs
P2-47	*Collar DC, Dipaolo E, Mehta RS; Christopher Newport University, University of Rhode Island, University of California Santa Cruz*	Evolutionary transformation along orthogonal anatomical axes in blennioid fishes
P2-48	*McHugh KA, Stevens DR, Baker JA, Foster SA; Clark University,*	Stress, Asymmetry, and Evolutionary Change in a Population of Threespine Stickleback (Gasterosteus aculeatus) with Respect to a Novel Predator
P2-49	*Schachner ER, Diaz RE, Hedrick BP; Louisiana State University Health Sciences Center, California State University Los Angeles*	Anatomy of the crocodylian bronchial tree and implications for the ancestral archosaurian lung
P2-50	*Mason JN, Stevens II DR, Graham MA, Foster SA, Baker JA; Clark University*	Predation Effects on the Evolutionary Trajectory of Brain Morphology in the Threespine Stickleback Fish
P2-51	*Moore AG, Newbrey MG, Martín-Abad H, Boyd C, Hoganson J, Bair MA; Columbus State University, Universidad Autónoma de Madrid, North Dakota Geologic Survey, Emeritis Curator at North Dakota Heritage Center*	Earliest known material of *Amia*, bowfin, from the Sentinel Butte Formation (Paleocene), Medora, North Dakota
P2-52	*Beyl AR, Smaers JB, Gignac PM, Watanabe A, Wilberg EW, Turner AH; Stony Brook University, Oklahoma State University Center for Health Sciences, New York Institute of Technology College of Osteopathic Medicine*	Evolutionary Regime Shifts in Crocodylian Neuroanatomy
P2-53	*Jacobs JL, Hall AS, Smith EN; University of Texas at Arlington, Thermo Fisher Scientific*	Learning to swim: evolutionary transition from terrestrial to aquatic life in South American coralsnakes
P2-54	*Stapp C, Stankowich T, Paig-Tran M; CSU Long Beach, CSU Fullerton*	Investigating How Ecological Traits Influence the Evolution and Diversity of Armadillo Armor
P2-55	*Mesrop LM, Goodheart JG, Leung NL, Oakley TO; University of California Santa Barbara*	Gut Feeling: Characterizing the Origin and Divergence of Cell Types in the Light Organ of Bioluminescent Ostracods.
P2-55.5	*Lessner EJ, Holliday CM; University of Missouri*	Diversity and evolution of trigeminal branching patterns in sauropsids

Complementary to S4: Reproduction: the female perspective from an integrative and comparative framework

P2-56	*Fairbanks J, Demarais A; University of Puget Sound*	Effects of Bisphenol-S and Estrogen on *p53* Expression in Ovarian Tissue of Zebrafish (*Danio rerio*)
P2-57	*Cook TO, Fargevieille A*, Warner DA; Auburn University*	Dorsal pattern polymorphism in female Brown Anoles: testing the "male-mimicry hypothesis"
P2-58	*Torres B, Jelken M, Omane H, Bellesia G, Hayssen V; Smith College*	Linguistic Bias in Reproduction
P2-59	*MacLeod PF, Renn SCP; Reed College*	The operational sex ratio and reproductive state influence female aggression and competition in a conventional lek-like mating system
P2-60	*Navara KJ, Graden K, Mendonça MT; University of Georgia, Auburn University*	More is not always better: Yolk supplementation decreases rate of yolk deposition in Japanese quail, Coturnix japonica
P2-61	*Dean CR, Mendonça MT, Navara KJ; University of Georgia, Auburn University*	Influences of chronic testosterone treatment on follicle growth rates in laying hens
P2-62	*De Bruijn R, Khoshaba E, Lopes PC*; Chapman Univ*	HPA-axis Functioning and Parental Care in Japanese Quail
P2-63	*Lewis AK; University of Florida*	Understanding Sex and Gender as a Scientist: Why It Matters Now More Than Ever

P2-64 *Roncalli V, Cieslak MC, Hopcroft RR, Lenz PH; University of Barcelona, University of Hawai'i at Mānoa, University of Alaska* — Capital Breeding In a Diapausing Copepod: a Transcriptomics Analysis

P2-65 *Karachiwalla Z, Decarvalho T, Burns M; UMBC* — Three-dimensional Visualization of Harvestman Spermathecae using Confocal Microscopy

P2-66 *Baker JA, Heins DC, King RW, Foster SA; Clark University, Tulane University* — The search for the Holy Grail: an explanation for the relationship between offspring size and maternal size

Comparative & Environmental Endocrinology

P2-67 *Wade K, Monceaux C, Close M, Grubb O, Strickland T, O'Brien S; Radford University* — Trenbolone Half-life and Metabolism in *Gambusia*

P2-68 *Greives T, Eshleman M, Galante H, Deimel C, Hau M; North Dakota State University, Max Planck Institute for Ornithology* — Testosterone peaks in the early evening and GnRH-induced testosterone is correlated with this peak

P2-69 *Abernathy AL, Klar EA, Jordan CH, Joshi MM, Newbrey MG; Columbus State University* — Comparison of intersex severity between two types of histological sections using testes of Largemouth Bass (*Micropterus salmoides*) and Spotted Bass (*M. punctulatus*) from the Chattahoochee River, Georgia

P2-70 *Joshi MM, Klar EA, Abernathy AL, Sibley AL, Belt JM, Newbrey MG; Columbus State University* — Background levels of intersex in Largemouth Bass (Micropterus salmoides) revealed through histological evaluation of gonadal tissue from three interconnected water bodies

P2-71 *Molina EM, Mendonça MT; Auburn University* — Inhibition pattern of testicular steroidogenesis by dichlorodiphenyldichloroethylene (DDE) during chronic and acute exposure

P2-72 *Axlid EG, Minicozzi MR, Buck CL, Von Hippel FA; Northern Arizona University, Minnesota State University* — Does Sodium Perchlorate Act as an Obesogen in Developing Zebrafish?

P2-73 *Clowser D, Wilson C, Petersen A, Postlethwait J; Oregon State University, University of Oregon* — Is it an Androgen, Estrogen, Obesogen, or all of the above? Perchlorate Exposure Causes Different Pathologies in Different Fishes

P2-74 *Myre B, Guentzel N, Mackenzie DS; TAMU* — A Novel Approach to an Old Question: Evaluation of Ecological Breeding Strategies in Sea Turtles

P2-75 *Zahra E, Griffin L, Minicozzi M, Mass M*; SUNY New Paltz, Minnesota State University* — Endocrine disruption and planarian regeneration

P2-76 *Starkey JM, White KJ, Pradhan DS; Idaho State University* — Androgen levels in sexually dimorphic musculature of a sex changing fish, *Lythrypnus dalli*

P2-77 *Feingold SR, Roark AM; Furman University* — Skin Deep: The Estrogenicity of Sunscreens and Moisturizers

P2-78 *Scobell SK, Gibson BL, Gibbs S, Forlano PM, Wilson AB; St Edward's University, University of North Carolina, City University of New York* — Comparative prolactin expression in the pituitary of the Northern pipefish and lined seahorse using immunofluorescent markers

Behavioral Development

P2-79 *Hope SF, Kennamer RA, Grimaudo A, Hallagan JJ, Hopkins WA; Virginia Tech, University of Georgia, Stockton University* — Does Within-Nest Variation in Incubation Temperature Lead to Differences in Competitive Ability Within Avian Broods?

P2-80 *González K, Warkentin KM, Güell BA; Purdue University, Boston University, Smithsonian Tropical Research Institute, Boston University* — Effects of hydration on the arboreal eggs of gliding treefrogs: even small reductions in humidity induce premature hatching, reduce hatchling size, and kill embryos

P2-81 *Guevara Molina SC, Ribeiro Gomes F, Warkentin KM*; University of São Paulo, Brazil, Boston University, Smithsonian Tropical Research Institute* — The VTMax of embryos: interacting effects of warming and dehydration on hatching behavior in red-eyed treefrogs, Agalychnis callidryas (Anura: Phyllomedusidae)

P2-82 *Fletcher SJ, De-Jesus Soto MG, Rodriguez SD, Pretends Eagle TJ, Petanidou T, Tscheulin T, Barthell J, Giray T, Abramson CI; Oklahoma State University, University of Puerto Rico, St Philip's College, North Dakota State University, University of the Aegean, University of Central Oklahoma* — Memory of the cap pushing response in honey bees (Apis mellifera cecropia)

P2-83 *Fletcher SJ, De-Jesus Soto MG, Rodriguez SD, Pretends Eagle TJ, Petanidou T, Tscheulin T, Barthell J, Giray T, Abramson CI; Oklahoma State University, University of Puerto Rico, St Philip's College, North Dakota State University, University of the Aegean, University of Central Oklahoma* — Discriminate punishment of the cap pushing response in honey bees (Apis mellifera cecropia)

P2-84	*Serrano-Rojas S, Jung J, Warkentin KM; Glasgow University, Boston University, Smithsonian Tropical Research Institute*	Multimodal mechanosensing for escape-hatching decisions of red-eyed treefrogs
P2-85	*Sermersheim LO, Woodruff MJ, Rosvall KA; Indiana University*	Behavioral responses to acute and persistent heat stress in nestling tree swallows (*Tachycineta bicolor*)
P2-86	*Vinson A, Lattin C; Louisiana State University*	House Sparrows Show Wide and Repeatable Individual Variation in Behavioral Responses to Novel Objects and Foods
P2-87	*Rodriguez SD, De Jesus-Soto MG, Fletcher SJ, Pretends Eagle TJ, Pentanidou T, Tscheulin T, Barthell J, Giray T, Abramson CI; St Philip's College, University of Puerto Rico, SE Okla St Univ, North Dakota State University, University of the Aegean, University of Central Oklahoma*	Extended training and punishment reduced extraneous errors of the cap pushing response in honey bees (*Apis mellifera*)
P2-88	*Babb MH, Lohmann C; University of North Carolina at Chapel Hill*	A Comparison of Stereotypic and Anticipatory Behavior in Cougars (*Puma concolor*) and Lions (*Panthera leo*) from Zoo to Sanctuary

Foraging, Predators, and Prey

P2-89	*Burns MP, Saltz JB; Rice University*	Understanding the sources of variation that contribute to differences in decision making outcomes
P2-90	*Adams DR, Gifford M; Vilonia High School, University of Central Arkansas*	Lizards Modulate Foarging Behavior in Response to Environmental Variation
P2-91	*Harman AR, Sjoblom NP, Renn SCP; Reed College*	Behavioral Conditioning of *Astatotilapia burtoni* Without Overtraining
P2-92	*Carty T, Philson C, Davis J; Radford University*	Sex, Food, and Friends in Daily Life: Learning and Transmission of Knowledge in Captive Zebra Finches
P2-93	*Talal S, Youngblood J, Farington R, Cease AJ, Harrison JF; Arizona State University*	Outbreaking Locusts (*Schistocerca cancellata*) in Paraguay are Carbohydrate Hungry which Increase their Performance
P2-94	*Wang SY, Zavalaga CB, Polito MJ; Louisiana State University, Universidad Científica del Sur*	Consistent Foraging Niche Partitioning Between Two Peruvian Seabirds Under Varying El Niño-La Niña Conditions
P2-95	*Fletcher SJ, De-Jesus Soto MG, Abramson CI, Barthell J, Petanidou T, Tscheulin T, Giray T; Oklahoma State University, University of Puerto Rico, University of Central Oklahoma, University of the Aegean*	Incentive Contrast vs Optimal Foraging in Honey Bee Decision Making
P2-96	*Gough WT, Cade DE, Potvin J, Kahane-Rapport SR, Goldbogen JA; Stanford University, University of California Santa Cruz, Saint Louis University*	Scaling of Lunge Feeding Kinematics in Baleen Whales
P2-97	*Plum F, Labonte D; Imperial College London*	Large-scale analysis of ant foraging dynamics enabled by Deep Convolutional Neural Networks
P2-98	*Webber RL, Hodgson ML, McGaw IJ, Wyeth RC; St Francis Xavier University, Memorial University*	Lobster Behavioral Responses to Different Prey and Bait Types
P2-99	*Bardjis C, Stevens DR, Graham M, Foster SA, Baker JA; Clark University*	The Role of Predation Threat in the Development of Antipredator Behavior
P2-100	*Hodgson ML, Webber RL, McGaw IJ, Wyeth RC; St Francis Xavier University, Memorial University*	Can problem-solving during natural foraging give insight into behavioural innovation by the American Lobster, *Homarus americanus*?
P2-101	*Owen P, Agyei D, Jilani C, Joshi D, Miller A, Odaka Y, Tran M, Wilson K; University of Cincinnati*	Food Choices of Rusty Crayfish (*Faxonius rusticus*) Maintained on Fiber-rich and Protein-rich Diets Relative to Changes in Their Gut Microbiomes
P2-102	*Pretends Eagle TJ, Rodriguez SD, Gonzalez V, Abramson CI; North Dakota State University, Saint Philip's College, University of Kansas, Oklahoma State University*	Ants Build Defensively Against Ant Traps in the Field
P2-103	*Pretends Eagle TJ, De Jesus-Soto MG, Rodriguez SD, Fletcher SJ, Pentanidou T, Tscheulin T, Barthell J, Giray T, Abramson CI; North Dakota State University, University of Puerto Rico, Saint Philips College, Oklahoma State University, University of the Aegean, University of Central Oklahoma*	The Effect Of Extended Training Cap Pushing Response, Extinction In Honey Bees (Apis Mellifera)
P2-104	*Armstrong TBK, Davis E, Dickerson H, Healy JE; Austin College*	Implication of Choice of Burrow Location in the Thirteen-Lined Ground Squirrel (*Ictidomys tridecemlineatus)*

P2-105 *Pendleton LP, Cornelius JM, Chapple TC, Wikelski M, Hahn TP, Hunt KE; Eastern Michigan University, University of Oregon, Max Planck Institute of Animal Behavior, University of California Davis, Northern Arizona University*
Food Availability and Its Effects on Spatial Habitat Use in Breeding and Nonbreeding Red Crossbills (*Loxia curvirostra*)

P2-106 *Horvath T, Bergey L, Ritchie L, Semanchik P; Centenary University*
Competitive interaction and foraging speed in the invasive shrimp, Palaemon macrodactylus, and three species of native Palaemon shrimp in New Jersey Waters.

P2-107 *Farr D, Dobkowski K; University of Southern California, Friday Harbor Labs, Bates College*
Scrumptious *Sargassum*: Feeding Preferences of *Pugettia producta*

P2-108 *Khoja A, Kwitny M, Staples AE, Schürch R; Virginia Tech*
Development of an Open Source Implementation of Automated Honey Bee Waggle Dance Decoding Using Particle Image Velocimetry

P2-109 *Brady PC, Garcia M, Hernandez T, Aalund M, Ellerd R, Gruev V, Cummings ME; University of Texas at Austin, University of Illinois at Urbana Champaign, Texas A&M University*
A comparison of two distinct pelagic camouflage strategies in teleosts

Neuroethology

P2-111 *Caron DP, Scibelli AE, Trimmer BT; Tufts University*
Nociceptive strike behavior in *Manduca sexta* is mediated by multimodal sensory neurons

P2-112 *Lozier NR, Sisneros JA; University of Washington*
Changes in Saccular Hair Cell Density During Ontogeny of the Plainfin Midshipman Fish

P2-113 *Naughton LF, Cannizzaro DN, Pask GM; Bucknell University*
One Big, Smelly Family: Decoding the Olfactory Receptors in the Indian Jumping Ant

P2-114 *Zeng R, Brown A, Sisneros J; University of Washington*
Age-related change in the auditory sensitivity of zebrafish (*Danio rerio*)

P2-115 *Lefauve MK, Hernandez LP; George Washington University*
Early Ontogeny of Sensory Processing Regions in the Brain of the Grass Carp

P2-116 *Dang H, Martinez Acosta V; Univ of the Incarnate Word*
Immunohistochemical Analysis of Synaptic Proteins During Regeneration

P2-117 *Johnston M, Finton C, Brass K, Ophir AG, Campbell P; Oklahoma State University, Cornell University, University of California Riverside*
Central oxytocin and vasopressin receptor distributions in the house mouse, *Mus domesticus*, and non-commensal congeners, *M. spretus* and *M. spicilegus*

P2-119 *Stewart H, Hayes D, O'Brien S; Radford University*
Exploring the Efficacy of Opiates on PTSD Through a Fish Model

P2-120 *Hardy AR, Hale ME; University of Chicago*
A new sensory ending in the paired fins of damselfish

P2-121 *Dunton AD, Bautista NM, Crespel A, Burggren WW; University of North Texas*
Transgenerational Neurological and Behavioral Effects of Combined Exposure to Crude Oil and Hypoxia

P2-122 *Woods CE, Padilla G, Todd K; Westminster College*
Behavioral and Electrophysiological Response of Medicinal Leeches to UV Light

P2-123 *McConnell I, Schulz J, Medina K; Occidental College*
Analysis of synthetic cone snail venom through a novel zebrafish spinal motility assay

P2-124 *Oberman W, Kondrashov P, Maisano J, Young BA; Kirksville College of Osteopathic Medicine, University of Texas at Austin*
Meningeal Structure in Reptiles

P2-125 *Frazer RE, Currea JP, Theobald JC, Wasserman SM; Wellelsey College, Floridal International University*
Anatomical and behavioral differences in *Drosophila melanogaster* and *Drosophila mojavensis* suggest divergence of visual circuits

Neuroanatomy & Neurobiology

P2-126 *Cannizzaro D, Naughton L, Pask G; Bucknell University*
Making Sense of Evolution: Deciphering the Rapid Expansion of Ant Pheromone Receptors

P2-127 *Ahmed MA, Deora T, Brunton BW, Daniel TL; University of Washington*
Multi-modal feedback in insect flight control

P2-128 *Faber-Hammond JJ, Renn SCP; Reed College*
Transcriptomics of *Haplochromis burtoni* parental and fasting behavior reveals extensive differentiation between stocks

P2-129 *Maier MA, Maruska KP; Louisiana State University*
GnRH as a Neuromodulator in Midbrain Sensory Regions during the Female Cichlid Reproductive Cycle

P2-130 *Hale ME, Menelaou E, Vasquez E; University of Chicago* — Median fin innervation of the zebrafish, *Danio rerio*, and implications for function

P2-131 *Dugan Z, Van Breugel F*; University of Nevada Reno* — The Role of Temporal and Spatial Memory in Food Search in Drosophila

P2-132 *Mbog RM, Williams J, Krajniak KG; Southern Illinois University Edwardsville* — The effects of temperature on contraction of smooth muscle in the earthworm *Lumbricus terrestris* and its action in response to acetylcholine

P2-133 *Gonzalez BD, Martinez Acosta VG; Univ of the Incarnate Word* — Overexpression of Beta-catenin During Regeneration in *Lumbriculus variegatus*

P2-134 *Barkan CL, Zornik E, Leininger EC*; Reed College, New College of Florida* — Identifying neuronal properties underlying the evolution of divergent vocal behaviors

P2-135 *Valadez J, Williams C, Beaudoin G; Trinity University* — Red-light activated neuronal control with an optimized mammalian expression vector

P2-136 *Han JW, Friesen CN, Young RL, Hofmann HA; UT Austin* — Social Regulation of Neural Transcriptomes

P2-137 *Lent DD, Mendoza A; CSU Fresno* — Navigating in the face of change: Modeling how changes in the visual environment of ants disrupts navigation.

P2-138 *Khawaja Y, Husak J; University of St Thomas* — Effects of Triiodothyronine on Metabolism in Lizards

P2-139 *Go M, Notar JC, Johnsen S; Duke University* — Associative learning in the brittle star *Ophioderma brevispinum*

P2-140 *Nourbakhsh_Rey M, Markham MR; University of Oklahoma* — Metabolism Sensing Mechanisms in the Electric Organ Cells of a Weakly Electric Fish

P2-141 *Havens LT, Lohmann KJ; University of North Carolina, Chapel Hill* — A model for directional magnetic field processing in the Caribbean spiny lobster *Panulirus argus*

P2-142 *Kazmi JS, Bukowski-Thall GL, Tsang RH, Miller AI, Christie AE, Dickinson PS; Bowdoin College, University of Hawaii Manoa* — The role of behavioral diversity in determining the extent to which neural patterns are modulated

P2-143 *Wong BH, Kaye RJ, Christie AE, Dickinson PS; Bowdoin College, University of Hawaii Manoa* — Differential modulation of pattern generating networks by multiple members of a single neuropeptide family

P2-143.5 *Brittain CB, Smith T, Still SE, Menon A, Cristol DA, Wada H; Auburn University, William & Mary* — Effects of Dietary Methylmercury on Songbird Hippocampal Neuroanatomy

Molecular Mechanisms of Ecophysiology

P2-144 *McCue MD, Lighton JRB; Sable Systems International* — ^{13}C-Glucose oxidation testing in laboratory mice: effects of dose, temperature, and nutritional state

P2-145 *Duong P, Riley GF, Romero MF, Piermarini PM, Gillen CM*; Kenyon College, Mayo Clinic, Ohio State University* — Immunohistochemical Localization of aeCCC2 in *Aedes aegypti* Larvae

P2-146 *Parry HA, Yap KN, Gladden LB, Hill GE, Hood WR, Kavazis AN; Auburn University* — MitoMobile Validation: Taking a Molecular Physiology Lab to the Field

P2-147 *Glidden CA, Deakin JE, Desimone JG, Elowe CR, Groom DJE, Slezacek J, Gerson AR; University of Massachusetts Amherst, University of Western Ontario* — Assessment of Novel Biomarkers of Kidney Function and Damage in Migratory Songbirds After Long-duration Flight

P2-148 *Reardon KM, Husak JF; University of St Thomas* — Effects of aerobic exercise training on mitochondrial function in lizards

P2-149 *Ibarra JN, Whittemore KS, Naquin TE, Silva MA, Cho A, Teeple JB, Schenk HJ, Mocko K, Burnaford JL, Hoese WJ; California State University Fullerton* — Salinity Responses of the Desert Shrubs *Isocoma acradenia* and *Larrea tridentata*

P2-150 *Yamada KYH, Zikeli SL, Yap KN, Zhang Y, Kiaris H, Kavazis AN, Hood WR; Auburn University, University of South Carolina* — The relationship between the unfolded protein response and mitochondrial performance in deer mice maintained in a natural context

P2-151 *Harris JC, Rees BB; University of New Orleans* — HIF-1α Protein Levels in Tissues of *Fundulus grandis* During Hypoxia

Thermobiology

P2-152 *Hubert DL, Bentz EJ, Mason RT; Oregon State University* — Transcriptional Response to Acute Thermal Stress in the Red-sided Garter Snake (*Thamnophis sirtalis parietalis*)

P2-153 *Shah AA, Woods HA; University of Montana* — Who can take the heat? Microclimates mediate heat tolerance in wasp-caterpillar interactions

P2-154 *Deery SW, Haro D, Gunderson A; Tulane University* — Are Introduced Species More Plastic? A Comparison of the Heat-Hardening Capacity of Native and Non-Native *Anolis* Lizards

P2-155 *Marroquin-Flores RA, Mortimer NT, Paitz RT, Bowden RM; Illinois St U* — Thermal fluctuations produce ecologically relevant expression profiles for temperature-responsive genes

P2-156 *Harter LN, Stahlschmidt ZR; U Pacific* — Does reproductive investment trade off with hardening or cross-tolerance related to heat and desiccation?

P2-157 *Lima AS, Ferreira LF, Gomes FR, Titon SCM*; University of São Paulo, University Center Fundação Santo Andre* — Thermal Sensitivity of Bullfrog's Immune Response Kept at Two Different Temperatures

P2-158 *Bilyk KT, Sformo T; Western Kentucky University, University of Alaska Fairbanks* — Heat Tolerance of North Slope Fishes

P2-159 *Cochran JK, Orr SE, Buchwalter DB; North Carolina State University* — Assessing the concept and thermal sensitivity of the Pcrit in the mayfly *N. triangulifer*

P2-160 *Shannon ES, Powers DR; George Fox University* — Heat Dissipation by Hummingbirds during Perching Following a Hovering Bout

P2-161 *Lisondro AK, Mendez-Narvaez J; Universidad Autonoma de Chiriqui, Smithsonian Tropical Research Institute* — Thermal Ecology in Two Neotropical Frogs with Different Degrees of Terrestriality

P2-162 *Clifton IT, Refsnider JM; University of Toledo* — Characterizing the Thermal Ecology of a Montane Lizard Community

P2-163 *Unfried LN, Teets NM; University of Kentucky* — Benefits of Rapid Cold Hardening at Sublethal Temperatures in *Drosophila melanogaster*

P2-164 *El-Shesheny IA, Matoo OB, Delong JP, Montooth KL; University of Nebraska-Lincoln, Tanta University* — Connecting thermal performance from mitochondrial physiology to population growth rate in an outbred insect population

P2-165 *Keaveny EC, Dillon ME; University of Wyoming* — Brood Incubation May Provide Reciprocal Thermal Benefits for Worker Bumble Bees

P2-166 *Van Sant MJ, Oufiero CE; Cameron University, Towson University* — Effects of Dehydration on Cutaneous Water Loss and Preferred Body Temperature in *Sceloporus consobrinus*

P2-167 *Ramsaran SK, Waters JS; Providence College* — Heat shock physiology: measuring the metabolic impacts of thermal stress in Drosophila melanogaster

P2-168 *Turrell M, Leal M; University of Missouri* — Microclimate Influences Variation in the Upper Thermal Tolerance of a Complex Lifecycle Amphibian

P2-169 *Cuevas-Sanchez AY, Moeser E, Buhl K, Dinh KV, Dowd WW; Washington State University, University of California Los Angeles* — Interactive effects of oxygen and temperature on physiology and behavior of the splash pool copepod *Tigriopus californicus*

P2-170 *Pulley KL, Percival C, Tapsak ST, Tscheulin T, Pentanidou T, Gonzalez VH, Hranitz JM, Barthell JF; University of Texas at El Paso, Pomona College, Bloomsburg University of Pennsylvania, University of the Aegean, University of Kansas, University of Central Oklahoma* — Differences in critical thermal maximum between crepuscular vs. diurnal species of *Xylocopa*

P2-171 *Percival C, Pulley K, Tapsak S, Tscheulin T, Pentanidou T, Gonzalez V, Abramson C, Hranitz J, Barthell J; Pomona College, University of Texas at El Paso, Bloomsburg University, University of the Aegean, University of Kansas, Oklahoma State University, University of Central Oklahoma* — The effect of social context, acclimation, and feeding status on critical thermal maximum of honey bees

P2-172 *Skelton ZR, Wegner NC, Prinzing TS, Hastings PA; University of California San Diego, NOAA Fisheries, Simon Fraser University* — Comparison of Temperature Preference and Q_{10} Between Two Juvenile Shark Species

Energetics

P2-173 *Tituskin JR, Brady SP, Seetharaman K, McKeon AM, Raffel TR; Oakland University* — Metabolic effects of temperature and food provisioning support a MTE/DEB model of thermal acclimation in axolotls

P2-174 *McNamara-Bordewick NK, Maas AE, Blanco-Bercial L, Tarrant AM; Barnard College, Bermuda Inst Ocean Sciences, Woods Hole Oceanogr Inst* — Oceanic Copepods Fine-Tune Metabolic Activity During Diel Vertical Migration

P2-175 *D'Alessandro MN, Howey CAF; University of Scranton* — Metabolic Rates of City Anoles

P2-176 *Marroquin CM, Munoz-Garcia A; Ohio State University* Energy Expenditure Among Different Roost Types and Colony Sizes Observed in Chiroptera

P2-177 *Cavey LT, Secor SM; University of Alabama* Larger Meals Generate a Disproportionate Greater Cost of Digestion

P2-178 *Gefen E, Raviv D; University of Haifa-Oranim* Post-feeding metabolic response and thermal preference in the scorpion *Hottentotta judaicus*

P2-179 *Quintanilla Ramirez GS, Treidel LA, Williams CM; Univ of California Berkeley* Aerobic Scope is increased to support flight in wing-polymorphic female crickets, *Gryllus firmus*

P2-180 *Groom DJE, Elowe CE, Slezacek J, Gerson AR; University of Massachusetts Amherst, University of Western Ontario* Whole-animal Metabolic Phenotype Before and After a Migratory Flight in the Yellow-rumped Warbler (*Setophaga coronata*)

P2-181 *Cornelius JM, Cameron R, Bradley D; Oregon State University, Eastern Michigan University* Activity drives investment in hematocrit recovery versus fat storage in food-restricted captive red crossbills *Loxia curvirostra*

P2-182 *Mineo PM, Parlin A, Do Amaral JPS, Schaeffer PJ; Elmhurst College, University of Cincinnati, Clermont College, Miami University* How does diet composition affect thermal preference and the aerobic scope of digestion?

Biomaterials - Adhesion

P2-183 *Pamfilie AM, Garner AM, Niewiarowski PH; University of Akron* Watch Your Step: A Comparison of Digital Morphology Across Ecomorphs in *Anolis* Lizards

P2-184 *Seleb B, Thatcher M, Lieb J, Noel A; Georgia Institute of Technology, Georgia Tech Research Institute* Sure-Footed in Slippery Situations: Underwater Grip with Otter Paws

P2-185 *Kaimaki DM, Attipoe AEL, Stoukidi MN, Labonte D; Imperial College London* Temperature-Induced Viscosity Changes of the Insect Pad Secretion

P2-186 *Falso MS, Gustafson KL, Marshall LV, Falso PG; Slippery Rock University* Investigation of Nuptial Pads in *Xenopus laevis* Exposed to the Pesticide Imidacloprid

P2-187 *Ringenwald BE, Bogacki EC, Stark AY; Villanova University* Crawl or Fall: The Effect of Variable Temperature and Humidity on Gecko Locomotion

P2-188 *Bogacki EC, Ringenwald BE, Stark AY; Villanova University* Stick and Run: Locomotor Behavior of Tokay Geckos on Wet and Dry Substrates

P2-189 *Satterlie RA, Hermans CO, Norekian TN; University of North Carolina Wilmington, Sonoma State University, Whitney Laboratory for Marine Bioscience* Ultrastructure of Adhesive Papillae on the Buccal Cones of the Pteropod Mollusc *Clione limacina*: Evidence for a Duo-Gland Adhesive System

P2-190 *Implicito CJ, Stark AY; Villanova University* The Effect of Surface Temperature on Adhesion of a Temperate Ant

Eco/evomorphology - Limbs, shells and tails

P2-192 *Lang KL, Gifford ME; University of Central Arkansas* Multivariate analyses of performance tradeoffs and phenotypic integration in the prairie lizard (*Sceloporus consobrinus*)

P2-193 *Chevalier-Horgan C, Pierce SE, Hutchinson JR, Diogo R, Molnar JL; NYITCOM, Harvard University, Royal Veterinary College, Howard University* Biomechanical modelling of tetrapods: the structural and functional adaptation from aquatic to terrestrial life

P2-194 *Robin H, Stayton CT; Bucknell University* Are there common patterns of ontogenetic shell shape changes between aquatic and terrestrial emydid turtles?

P2-195 *Young VKH, Starner MK, Baeza JA, Blob RW; Saint Mary's College, Clemson University* Comparative Limb Bone Scaling and Shape in Emydid Turtles

P2-196 *Kubicek KM, Britz R, Conway KW; Texas A&M University, Natural History Museum* Ontogeny of the Pectoral-fin Radials in Catfishes

P2-197 *Woldt KM, Sustaita D; California State University San Marcos* Preliminary analysis of climbing morphology and performance of the salt marsh harvest mouse and co-occurring species in the Suisun Marsh, California

P2-198 *Rivera G, Neely CMD; Creighton University* Patterns of fluctuating asymmetry in the limbs of freshwater turtles

Morphology and mechanics - muscles and tendons

P2-199	*McCue MD, Klok JC, Lighton JRB, Hammond KA; Sable Systems International, University of California Riverside*	Energetics of Peromyscus treadmill running at different speeds, inclines, and environmental temperatures
P2-200	*Stover KK, Roberts TJ, Azizi E; University of California Irvine, Brown University*	The shape of things to come: Age-related restriction in muscle shape change during shortening
P2-201	*Huynh G, Duman A, Azizi E; University of California Irvine*	Effects of Caffeine on Jump Performance in *Rhinella marina*
P2-202	*Asencio AM, Powers JD, Williams CD, Malingen SA, Daniel TL; University of Washington, University of California, Allen Institute of Cell Science*	Predicting complex modulus of active muscle from models of elastically coupled molecular motors
P2-203	*Panessiti CE, Rickards G, Rull M, Konow N; UMass Lowell, Andover High*	Does the contribution of elastic recoil vary with temperature and between strike and chewing behaviors in axolotl feeding?
P2-204	*Valencia MM, Ashzand BA, Bowens JL, Monroy JA, Horner JM; California State University San Bernardino, Claremont Colleges*	The effects of different exercise regimes on tendon remodeling in mice (*Mus musculus*)
P2-205	*Glass JR, Harrison JF; Arizona State University*	Testing the limits: Physiological responses of honeybees (*Apis mellifera*) during flight in variable-density gases
P2-206	*Delap SJC, Rimkus B, Shehaj A, Konow N; UMass Lowell*	The effect of stimulation intensity on the range of optimal lengths of mouse hindlimb muscles
P2-207	*Mendoza E, Schwaner J, Freymiller G, McGowan C, Clark R, Azizi E; University of California Irvine, University of Idaho, San Diego State University*	Kinematics of kangaroo rat foot-drumming
P2-208	*Hatcher M, Florendo J, Maia A; Rhode Island College, University of Rhode Island*	Rising Ocean Temperatures Affect Red and White Muscle Recruitment in Fish Species
P2-209	*Cox SM, Deboef A, Salzano MQ, Katugam K, Piazza SJ, Rubenson J; Penn State, Georgia Tech*	Elastic System Shows No Plasticity to Different Functional Demands During Growth
P2-210	*Hernandez LP, Prado MA*, Mendoza-Castillo JM; George Washington University*	Histological diversification in the muscular anatomy of the palatal organ with Cypriniformes
P2-211	*Kimball D, Minicozzi M, Gibb A; Northern Arizona University, Minnesota State University*	Bonytail, the Arizona tuna, convergence in muscle and tendon anatomy in scombrids and Gila cypha
P2-212	*Lin K, Feiler A, Chu W, Garcia N, Ilton M; Harvey Mudd College*	Understanding the Elastic Efficiency of Biological Springs
P2-213	*Cook A, Ilton M; Harvey Mudd College*	Computational Modeling of Latch-Spring Systems
P2-213.5	*Schulz AK, Rincon C, Hu DL; Georgia Institute of Technology*	Elephant Trunks Behave like Telescoping Poles

Locomotion - Legs, joints and stability

P2-214	*Unsworth CK, Astley HC; University of Akron*	Quantifying the compliance of the millipede body while traversing irregular terrain
P2-216	*McNamara A, Dunham NT, Young JW, Stanton DW, Wood J, Shapiro LJ; University of Texas Austin, Cleveland Metroparks Zoo, Northeast Ohio Medical University*	Comparative platyrrhine walking kinematics across natural, discontinuous substrates
P2-217	*Iljima M, Munteanu VD, Diamond KM, Blob RW; Clemson University*	Locomotor mechanics of juvenile alligators reveals ontogenetic changes in the roles of the fore- and hindlimbs
P2-218	*Mannava A, Schapker N, Lewis C, German R, Young JW; NEOMED*	Effects of preterm birth on locomotor performance in infant pigs
P2-219	*Flores E, Duman A, Azizi E; University of California Irvine*	The effects of extrinsic loading on the coordinated landings of *Rhinella marina*
P2-220	*Po T, Heydari S, Kanso E, McHenry MJ; UC Irvine*	The neuromechanics of locomotion in sea stars (Protoreaster nodosus)
P2-221	*Saintsing AJ, Full RJ; University of California Berkeley*	Running endurance after leg loss in cockroaches
P2-223	*Maisonneuve MC, Schiebel PE, Goldman DI; Georgia Institute of Technology*	A robophysical snake with bio-inspired actuation to explore the role of passive mechanics in limbless locomotors.
P2-224	*Vick CP, Gifford ME; University of Central Arkansas*	Climbing Performance as a Physical Cost of Reproduction in Prairie Lizards (*Sceloporus consobrinus*)

P2-225 *Madrid Galicia VS, Arias AA, Vega K, Elsey RM, Azizi E, Owerkowicz T; Univ of California Irvine, CSU San Bernardino, Rockefeller Wildlife Refuge* — Effects of caudofemoralis longus tenotomy on 3D kinetics and kinematics in juvenile alligators

P2-226 *Bonnan MF, Moore CL*, Barton A, Dizinno J, Muller K, Smith J, Walker J; Stockton University, Red Bank Veterinary Hospital* — Hands down: Understanding elbow kinematics of the central bearded dragon (*Pogona vitticeps*)

P2-227 *Ozkan-Aydin Y, Liu B, Goldman DI, Hammond III FL; Georgia Institute of Techology* — Lateral Undulation Aids Soft Earthworm Robot Anchoring and Locomotion in Heterogeneous Environments

P2-228 *Wunderlich RE, Orlandi D, Tongen AL; James Madison University* — The effect of enclosure type on locomotion and energy expenditure in captive lemurs

Complementary to S5: Form, structure and function: How plants vs. animals solve physical problems

P2-229 *Reppe F, Huss JC, Fratzl P, Eder M; Max-Planck-Institute of Colloids and Interfaces* — *Banksia* seed pod opening - structure and mechanics of a long-term functional pericarp

P2-230 *Hansen AK, Lent DD, Müller UK*; California State University Fresno* — How bio-inspiration teaches us: Digital fabrication and modeling in STEM education and outreach

P2-231 *Miller FM, Geller JB, Kahn AS, Connolly TP; Moss Landing Marine Laboratories* — Impact of wave intensity on *Mytilus californianus* byssal thread strength

P2-232 *O'Leary NE, Stark AY; Villanova University* — Adhesive Performance of Tokay Geckos (*Gekko gecko*) as a Function of Variable Surface Temperature

P2-233 *McDuffee Altekruse A, Harley CM, Li J, Edon JA, Zemke D; Metropolitan State University* — More is not necessarily better: Physical therapy differentially influences crawl quality and quantity in *Hirudo verbana*

P2-234 *Singh K, Hidalgo F, Berg O, Law D, Müller UK; California State University, University of California Berkley* — Building a mechanical model of a tiny suction feeder to explore its performance landscape

P2-234.5 *Peters K, Langdon TR, Lent D, Hansen AK; California State University Fresno* — Fabricating biomechanics activities to increase K-16 students' interest in STEM

Host-parasite interactions: an intimate dance

P2-235 *Wohlleben AW, Foster SA, Baker J; Clark University* — The infection of young-of-year threespine stickleback by a cestode parasite

P2-236 *Jane A, Frederich M, Byron CJ; University of New England* — Detection of the invasive parasite *Proctoeces maculatus* at blue mussel aquaculture sites

P2-237 *Alaasam VJ, Keehn JE, Durso AM, French SS, Feldman CR; University of Nevada, Oregon Department of Fish and Wildlife, Utah State University* — Gone with the wind: side-blotched lizards (Uta stansburiana) have fewer parasites and a reduction in reactive oxygen metabolites at wind farms.

P2-238 *Ortiz TE, Chandler C; SUNY Oswego* — Prevalence of Microsporidia and *Wolbachia* infection in the amphipod *Gammarus fasciatus*

P2-239 *Anderson HB, Hutchinson M, Corbin CE, Hranitz JM; Bloomsburg University of Pennsylvania, Pennsylvania Department of Agriculture* — Avian Host Diversity Detected in Blood Meal Analysis of Two Species of *Culex* Mosquitoes Collected from Urban Habitats in Pennsylvania

Epidemiology and pathology

P2-240 *Watson LAR, Musgrove CM, Hinds AD, Ambardar M, Carvalho CM; Fort Hays State University* — Investigating the dissemination of antibiotic resistant *Enterobacteriaceae* microorganisms via a migratory bird species

P2-241 *Koch RW, Reichard M; Oklahoma State University* — Using ecological niche modeling to predict the suitable habitat for *Trichinella* species in cougars (*Puma concolor*) from Colorado

P2-242 *Shannon RP, Naden L, Bolek MG; Oklahoma State University* — Distribution of Oocysts of Two Neogregarines (*Mattesia* sp. and *Ophryocystis elektroscirrha*), which Infect the Hypodermis of Fire Ants, Solenopsidini, and Milkweed Butterflies, Danaini

P2-243 *Mullins H, Davis J, Aronson N; Radford University, Uniformed Services University* — Jungle Pharmacy: Exploring the Antibacterial and Antitrypanosomal Properties of *Ficus insipida*

Coral reef biology in the Anthropocene

P2-244 *Dixon G, Matz MV; University of Texas at Austin* — Generalized Environmental Stress Response in *Acropora* corals

P2-245	*Rippe JP, Baumann JH, Bove CB, Aichelman HE, Davies SW, Castillo KD; University of Texas at Austin, University of North Carolina Chapel Hill, Boston University*	Environmental drivers of coral growth across the western Caribbean Sea and Florida Keys
P2-246	*Aichelman HE, Wuitchik DM, Atherton KF, Kriefall NG, Davies SW; Boston University*	Do Facultative Coral Hosts Buffer Their Symbionts in Response to Thermal Extremes?
P2-247	*Bedwell H, Bay L, Fuller Z, Przeworski M, Matz MV; University of Texas at Austin, Australian Institute of Marine Science, Columbia University*	Mitochondrial introgression and its role in coral thermal tolerance
P2-248	*Cassavaugh CM, Lamont S, Szuch CP, Carfagno A, Gillevet PM, Bishop BM, Cook GM; New England College, George Mason University*	Combatting Antibiotic Resistance: Bioprospecting for Antimicrobial Peptides in the Deep-Sea Coral *Lophelia pertusa*
P2-249	*Szuch CM, Kephart ML, Sevigny JL, Simpson S, Cassavaugh CM, Thomas WK, Cook GM; New England College, University of New Hampshire*	Deep-sea Coral Reefs: Genomic Contributions to Bioprospecting in the Marine Environment
P2-250	*Hanes SD, Hubbuch J; Martin Methodist College*	Descriptive analysis of cellular organization in the *Aiptasia-Symbiodinium* model system

Monday Schedule of Events

Events take place in the JW Marriott Austin, unless otherwise noted

EVENT	TIME	LOCATION
Poster Session 3 Set Up	7:00 AM – 8:00 AM	Grand Ballroom
Speaker Ready Room	7:00 AM – 5:00 PM	Room 405
Registration	7:30 AM – 3:00 PM	Grand Ballroom Foyer
Coffee Break AM	9:30 AM – 10:30 AM	Grand Ballroom
Exhibit Hall	9:30 AM – 5:30 PM	Grand Ballroom
Coffee Break PM	3:30 PM – 4:30 PM	Grand Ballroom
Poster Session 3 Even Numbers Authors Present	3:30 PM – 4:30 PM	Grand Ballroom
Poster Session 3 Odd Numbers Authors Present	4:30 PM – 5:30 PM	Grand Ballroom
Poster Session 3 Teardown	5:30 PM – 6:00 PM	Grand Ballroom

SYMPOSIUM ORAL PRESENTATIONS

S7: Building Bridges from Genome to Phenome: Molecules, Methods and Models Chair: Karen Burnett, Jonathon Stillman, Donald Mykles, David Durica	7:45 AM – 3:30 PM	Lone Star D
S8: Long Limbless Locomotors: The Mechanics and Biology of Elongate, Limbless Vertebrate Locomotion Chair: Henry Astley	7:45 AM – 3:30 PM	Lone Star H
S9: Applied Functional Biology: Linking Ecological Morphology to Conservation and Management Chair: Lance McBrayer, Eric McElroy, Diego Sustaita	7:45 AM – 3:30 PM	Brazos

CONTRIBUTED PAPER ORAL PRESENTATIONS

MORNING

Session 71: Communication Mechanisms	8:00 AM – 9:45 AM	Lone Star A
Session 72: Evolutionary Morphology	8:00 AM – 9:45 AM	Lone Star B
Session 73: Get in My Belly: Feeding on a Variety of Foods	8:00 AM – 9:45 AM	Lone Star C
Session 74: Chchchchanging Climate, Part I	8:00 AM – 9:45 AM	Lone Star E
Session 75: Building a Better Muscle	8:00 AM – 9:30 AM	Lone Star F
Session 76: The Way That I Walk	8:00 AM – 10:00 AM	Lone Star G
Session 77: Ecophysiology of Oxygen Delivery	8:00 AM – 10:00 AM	Rooms 301-302
Session 78: Complementary to S10: Melding Modeling and Morphology: Integrating Approaches to Understand the Evolution of Form and Function, Part I	8:00 AM – 9:30 AM	Rooms 303-304
Session 79: Parental Care & Reproduction	8:00 AM – 9:45 AM	Room 205
Session 80: S.T.R.E.S.S. 1	8:00 AM – 9:45 AM	Rooms 201-202
Session 81: Where Do We Go From Here? Biogeography	8:00 AM – 9:45 AM	Rooms 203-204
Session 82: Bio-"Physical Fascination"-Biophysical Environment, Part I	8:00 AM – 10:00 AM	Rooms 402-403
Session 83: Complementary to S4: Reproduction: the Female Perspective From an Integrative and Comparative Framework, Part I	10:15 AM – 11:45 AM	Lone Star A
Session 84: Awesome Adaptations	10:15 AM – 11:45 AM	Lone Star B
Session 85: Chew on This	10:15 AM – 11:45 AM	Lone Star C
Session 86: Chchchchanging Climate, Part II	10:30 AM – 12:00 PM	Lone Star E
Session 87: (Don't) Trip, Stumble and Fall	10:00 AM – 12:00 PM	Lone Star F
Session 88: Morphology of the Senses	10:30 AM – 12:00 PM	Lone Star G
Session 89: Host-pathogen Interactions	10:30 AM – 12:00 PM	Rooms 301-302
Session 90: Complementary to S10: Melding Modeling and Morphology: Integrating Approaches to Understand the Evolution of Form and Function, Part II	10:15 AM – 12:00 PM	Rooms 303-304
Session 91: Sensory Basis of Organismal Interactions	10:15 AM – 12:00 PM	Room 205
Session 92: S.T.R.E.S.S. 2	10:15 AM – 11:45 AM	Rooms 201-202
Session 93: Migration and Navigation	10:30 AM – 12:00 PM	Rooms 203-204
Session 94: Bio-"Physical Fascination"-Biophysical Environment, Part II	10:30 AM – 11:30 AM	Rooms 402-403

AFTERNOON

Session 95: Complementary to S4: Reproduction: the Female Perspective from an Integrative and Comparative Framework, Part II	1:30 PM – 3:30 PM	Lone Star A
Session 96: Complementary to S5: Form, Structure and Function: How Plants vs. Animals Solve Physical Problems	1:30 PM – 3:30 PM	Lone Star B
Session 97: Everything Sucks	1:30 PM – 3:15 PM	Lone Star C
Session 98: Population Genetics	1:30 PM – 3:30 PM	Lonestar E
Session 99: Pulling and Tugging: Musculo-Skeletal Architecture	1:30 PM – 3:15 PM	Lone Star F
Session 100: Physiology Through the Seasons	1:30 PM – 3:30 PM	Lone Star G
Session 101: Two to tango: Host-parasite interactions	1:30 PM – 3:30 PM	Rooms 301-302
Session 102: Ecophysiology of Diet	1:30 PM – 3:30 PM	Rooms 303-304
Session 103: Sensing and Navigation	1:30 PM – 3:15 PM	Room 205
Session 104: Comparative Endocrinology	1:30 PM – 3:00 PM	Rooms 201-202
Session 105: The Evolution of Morphology	1:30 PM – 3:30 PM	Rooms 203-204
Session 106: The Evolution of Physiology	1:30 PM – 3:30 PM	Rooms 402-403

COMMITTEE AND BOARD MEETINGS

Student/Postdoc Affairs Committee	12:00 PM – 1:30 PM	Room 406
SICB Division Secretaries	12:00 PM – 1:30 PM	Room 401
POs, ICB editor and Symposium Organizers for Washington DC Meeting	12:00 PM – 1:30 PM	Room 409
Development Committee	12:00 PM – 1:30 PM	OP Italian Restaurant, Hotel

BUSINESS MEETINGS

SICB Society Meeting & Awards Presentation	5:30 PM – 6:30 PM	Lone Star D

WORKSHOPS AND PROGRAMS

Student Postdoctoral Affairs Committee: “How-To?” Daily Booth	9:15 AM – 5:00 PM	Grand Ballroom
NSF Program Officers: Funding Opportunities, Integrative Research and Education, and Q&A	12:00 PM – 1:30 PM	Lone Star C
Round-table discussion: Overcoming Challenges for Testing Gene Function in Post-Embryonic Life Stages	12:00 PM – 1:30 PM	Rooms 211-212
Student Support Committee Brown Bag Workshop for Graduate Students: Writing a competitive GIAR/FGST grant proposal	12:00 PM – 1:30 PM	Room 404
Workshop: Parenting Through Academia	12:00 PM – 1:30 PM	Rooms 402-403
Podcast: Live Recording of Big Biology with Dr. Molly Cummings	3:30 PM – 4:30 PM	Room 407
DPCB Ask-An-Expert: Get Phylogenetic and Comparative Methods Support with an Expert	3:30 PM – 5:30 PM	Grand Ballroom

SOCIAL EVENTS

Morning Run	6:00 AM	JW Marriott Lobby
Broadening Participation Social	7:00 PM – 9:00 PM	Room 401
DVM/DCB Social	9:00 PM – 12:00 AM	South-East Lobbies

Monday Program Symposia

Note: Presenter is first author unless noted by an asterisk (*).

7:45 AM – 3:30 PM **Symposium S7** **Lone Star D**

Building Bridges from Genome to Phenome: Molecules, Methods and Models

Chairs: Karen Burnett, Jonathon Stillman, Donald Mykles, David Durica

7:45 am	**S7-1**	*Burnett KG, Durica DS, Mykles DL, Stillman JH; College of Charleston, University of Oklahoma, Colorado State University, San Francisco State University*	SICB Wide Symposium: Building Bridges from Genome to Phenome: Molecules, Methods and Models
8:00 am	**S7-2**	*Mauro AA, Ghalambor CK; Colorado State University*	The transcriptomic basis of a trade-off between salinity tolerance and competitive ability in the Trinidadian guppy
8:30 am	**S7-3**	*Lyko F; German Cancer Research Center (DKFZ)*	Epigenetic adaptation in a clonal invasive crayfish
9:00 am	**S7-4**	*Li J, Levitan BB, Kültz D; University of California Davis*	Quantitation and comprehension of context-dependent changes of dynamic proteomes
9:30 am	**Coffee Break**		**Grand Ballroom**
10:00 am	**S7-5**	*Havird JC; University of Texas Austin*	Building Bridges from the Mitogenome to the Mitophenome to the Organismal Phenome
10:30 am	**S7-6**	*Sharbrough J, Montooth K, Neiman M; Colorado State University, University of Nebraska, University of Iowa*	Phenotypic Variation in Mitochondrial Function across New Zealand Snail Populations
11:00 am	**S7-7**	*Santos SR, Hoffman SK, Seitz KW, Havird JC, Weese DA; Auburn University, Green River College, University of Texas at Austin, Georgia College and State University*	Phenotypic Comparability Arising from Genotypic Variability amongst Physically Structured Microbial Consortia
11:30 am	**S7-8**	*Milligan-Myhre KCA; University of Alaska Anchorage*	Using an evolutionary model organism to reveal host genetic influence on host-microbe interactions
12:00 pm	**Lunch Break**		
1:30 pm	**S7-9**	*Schaefer RJ, Baxter I, McCue ME; University of Minnesota, Donald Danforth Plant Science Center*	Using Camoco to integrate genome-wide association studies with context specific co-expression networks in corn and horses
2:00 pm	**S7-10**	*Gust KA; US Army*	Omics in Non-Model Species: Closing the Loop Among Genes, Molecular Systems, and Phenotypes to predict Adverse Outcomes to Environmental Stress
2:30 pm	**S7-11**	*Hahn DA; University of Florida*	Combining 'omics Approaches to Pick Apart the Genetic and Physiological Architectures of Seasonal Adaptation
3:00 pm	**S7-12**	*Garrett AD, Brennan RS, Steinhart A, Pelletier A, Pespeni MH*; University of Vermont*	Linking Genome to Phenome for Complex Traits: Studies of Global Change Adaptive Variation in Marine Invertebrates
3:30 pm	**Coffee Break**		**Grand Ballroom**

7:45 AM – 3:30 PM **Symposium S8** **Lone Star H**

Long Limbless Locomotors: The Mechanics and Biology of Elongate, Limbless Vertebrate Locomotion

Chair: Henry Astley

7:45 am	**S8-1**	*Astley HC; University of Akron*	Symposium Introduction - Long Limbless Locomotors Over Land: The mechanics and biology of elongate, limbless vertebrate locomotion
8:00 am	**S8-2**	*Astley HC; University of Akron*	Mechanics of Multi-articular Muscles Minimize Moments
8:30 am	**S8-3**	*Jayne BC; University of Cincinnati*	What Defines Different Modes of Snake Locomotion?

9:00 am	**S8-4**	*Fu Q, Gart SW, Mitchel TW, Kim JS, Chirikjian GS, Li C*; Johns Hopkins University*	Body lateral deformation and compliance help snakes and snake robots stably traverse large steps
9:30 am	**Coffee Break**		**Grand Ballroom**
10:00 am	**S8-5**	*Ward AB, Redmann E, Alqahtani A, Sheikh A, Mehta RS; Adelphi Univ, UC Santa Cruz*	East Coast Travel Is An Uphill Battle: Terrestrial locomotion in American Eels
10:30 am	**S8-6**	*Bergmann PJ, Mann SDW, Morinaga G, Freitas ES, Siler CD; Clark University, Oklahoma State University, University of Oklahoma*	Convergent evolution of vertebral morphology and locomotion in snake-like lizards
11:00 am	**S8-7**	*Tingle JL; University of California Riverside*	Prevalence of Facultative Sidewinding Locomotion in Non-specialist Snake Species
11:30 am	**S8-8**	*Capano JG, Brainerd EL; Brown University*	Reaction Forces and Rib Function During Locomotion in Snakes
12:00 pm	**Lunch Break**		
1:30 pm	**S8-9**	*Zamore SA, Araujo N, Socha JJ; University of Colorado Boulder, Virginia Tech*	Visual behavior in flying snakes: measurement and exploration with virtual reality
2:00 pm	**S8-10**	*Schiebel PE, Lin B, Hubbard AM, Chen L, Blekherman G, Goldman DI; Georgia Institute of Technology*	Specialization of control strategies in terrestrial slithering snakes.
2:30 pm	**S8-11**	*Choset HM; Carnegie Mellon University*	Geometric Methods for Locomotion in Limbless and Legged Systems
3:00 pm	**S8-12**	*Kano T, Ishiguro A; Tohoku University*	Decoding Decentralized Control Mechanism Underlying Adaptive and Versatile Locomotion of Snakes
3:30 pm	**Coffee Break**		**Grand Ballroom**

7:45 AM – 3:30 PM **Symposium S9** **Brazos**

Applied Functional Biology: Linking Ecological Morphology to Conservation and Management

Chair: Lance McBrayer, Eric McElroy, Diego Sustaita

7:45 am	**S9-1**	*McBrayer L, McElroy E*, Sustaita D; Georgia Southern University, College of Charleston, University of California at San Marcos*	Introduction: Applied Functional Biology: linking ecological morphology to conservation and management
8:00 am	**S9-2**	*Thompson CL, Williams SH, Glander KE, Teaford MF, Vinyard CJ; Grand Valley State University, Ohio University, Duke University, Touro University, Northeast Ohio Medical University*	Getting Humans Off Monkeys' Backs: Can Ecophysiological Research Inform Primate Conservation and Habitat Management Efforts?
8:30 am	**S9-3**	*Kienle SS, Powers J, Cacanadin A, Kendall T, Richter B, Costa DP, Mehta RS; UCSC*	Linking Functional Morphology, Behavior, and Ecology to Understand Foraging Strategies in an Endangered Marine Mammal
9:00 am	**S9-4**	*Wilson RS, Pavlic T, Wheatley R, Cameron SF; University of Queensland, Arizona State University*	Using performance to predict the survival of threatened mammals
9:30 am	**Coffee Break**		**Grand Ballroom**
10:00 am	**S9-5**	*Wyneken J, Salmon M; Florida Atlantic Univ*	Science, Sea Turtles, and Links to Conservation Management
10:30 am	**S9-6**	*Herrel A, Araspin L, Padilla P, Courant J, Serra Martinez A, Rebelo R, Ihlow F, Backeljau T, Mokhatla M, Ginal P, Rödder D, Measey J; CNRS/MNHN, Uuniversity of Lisbon, ZFMK, RBINS, Stellenbosch University J*	Rapid Local Adaptations in an Invasive Frog (*Xenopus laevis*): the Importance of Functional Trait Measurements to Predict Future Invasions.
11:00 am	**S9-7**	*McBrayer LD, Orton RW, Neel LK, Kaunert MD, Tucker DB, Williams SC; Georgia Southern University, University of Texas Arlington, Arizona State University, Ohio University*	Integrating Studies of Function and Ecology to Inform Conservation and Management

11:30 am	**S9-8**	*Mendelson III JR; Zoo Atlanta & Georgia Institute of Technology*	The Interface of Taxonomy, Systematics, Genetics, and Conservation
12:00 pm	**Lunch Break**		
1:30 pm	**S9-9**	*De Meyer J, Verhelst P, Adriaens D; University of Ghent*	The role of understanding the eel's morphology in stopping its decline
2:00 pm	**S9-10**	*Ryerson WG; Saint Anselm College*	Captive breeding alters head morphology and behavior in reptiles: implications for headstarting and reintroduction programs
2:30 pm	**S9-11**	*Mehta RS, Dale KE; University of California Santa Cruz*	Linking Fitness and Functional Roles Inside and Outside a Marine Protected Area Around Catalina Island
3:00 pm	**S9-12**	*Moran CJ, Gibb AC, Ward DL; Citadel, Northern Arizona University, United States Geological Survey*	Integrating studies of anatomy, physiology and behavior into conservation of imperiled cyprinid fishes of the Southwestern United States
3:30 pm	**Coffee Break**		**Grand Ballroom**

Monday Program Morning Sessions

Note: Presenter is first author unless noted by an asterisk (*).

8:00 AM – 9:45 AM **Session 71** **Lone Star A**

Communication Mechanisms

Chair: Fadeke Adeola

8:00 am	**71-1**	*Adeola FI, Lailvaux SP; University of New Orleans*	The Influence of Dampened Locomotor Function on Calling Structure in the house cricket *Acheta domesticus*
8:15 am	**71-2**	*Provini P; Centre for Research and Interdisciplinarity*	Birdsong for human(e) voices: Building efficient voice prostheses inspired from bird vocal system
8:30 am	**71-3**	*Burkhard TT, Phelps SM; University of Texas at Austin*	Evidence for heritable variation in the songs of Alston's singing mouse
8:45 am	**71-4**	*Rodriguez-Saltos CA, Ramsay G, Maney DL; Emory University, Children's Healthcare of Atlanta*	An R package to measure the similarity of natural sounds via mutual information
9:00 am	**71-5**	*Steele TJ, Barkan CL, Baas-Thomas N, Zornik E; Reed College*	Investigating the neuronal basis of sex-specific vocal behavior
9:15 am	**71-6**	*Fialko KY, Price TP; University of Chicago*	Comparative kinematics of *Phylloscopus* warbler territorial display behaviors
9:30 am	**71-7**	*Bloomston NA, Prather JF; University of Wyoming*	Neural Circuits Underlying Decision Making
9:45 am	**Coffee Break**		**Grand Ballroom**

8:00 AM – 9:45 AM **Session 72** **Lone Star B**

Evolutionary Morphology

Chairs: Edward Burress, Stephanie Baumgart

8:00 am	**72-1**	*Burress ED, Wainwright PC; University of California, Davis*	Are Oral and Pharyngeal Jaw Diversification Rates Correlated in Cichlid Fishes?
8:15 am	**72-2**	*Camarillo H, Muñoz MM; Yale University*	Macroevolutionary patterns of morphological diversification in wrasses
8:30 am	**72-3**	*Ford KL, Albert JS; University of Louisiana at Lafayette*	Convergent evolution of craniofacial morphologies in apteronotid and mormyrid electric fishes
8:45 am	**72-4**	*Godoy PL; Stony Brook University*	Cranial shape variation in Crocodylomorpha and the influence of ecological transitions during its evolutionary history

9:00 am	**72-5**	*Hedrick BP, Brocklehurst N, Mitchell JS, Benson RBJ; Louisiana State University Health Sciences Center, University of Oxford, West Virginia University*	Functional Constraints and Disparity in Bird Limb Proportion Evolution
9:15 am	**72-6**	*Baumgart SL, Claessens LPA; University of Chicago, Maastricht University*	Avian sternum disparity and ecomorphological implications
9:30 am	**72-7**	*Anderson CV, Reiter PA, Roberts TJ; Univ South Dakota, Brown University*	Examining the early stages of adaptive radiation in *Anolis roquet* from Martinique
9:45 am	**Coffee Break**		**Grand Ballroom**

8:00 AM – 9:45 AM Session 73 — Lone Star C

Get in My Belly: Feeding on a Variety of Foods

Chairs: Ashley Peterson, Dylan Wainwright

8:00 am	**73-1**	*Kolmann MA, Hughes LC, Evans K, Huie JM, Orti G, Hernandez LP; George Washington University, Brown University, University of Washington*	Carnivorous grazers? How to build scale-feeding and fin-feeding fishes from less egregious relatives
8:15 am	**73-2**	*Navon D, Rogers SM, Higham TE; University of California Riverside, University of Calgary*	Behavioral Variation in Feeding Strikes across Five Populations of Threespine Stickleback (*Gasterosteus aculeatus*)
8:30 am	**73-3**	*Peterson AN, McHenry MJ; Univ of California, Irvine*	Slow and steady wins the prey: The persistent predation strategy of the red lionfish (*Pterois volitans*)
8:45 am	**73-4**	*Perevolotsky T, Genin A, Holzman R; Tel Aviv University, Hebrew University of Jerusalem*	Work That Body: Thrust generated by the fins and body contributes to the feeding success of herbivorous reef fish
9:00 am	**73-5**	*Cooper WJ, Kniahnitskaya K, Nixon A, Devers M, Ringo D, Barber E; Washington State University*	Using genetically modified zebrafish to investigate the evolution and development of feeding in other minnows
9:15 am	**73-6**	*Marshall CD, Raley LN, Peredo CM, Pyenson ND; Texas A&M University, Portland State University, University of Michigan, Smithsonian Institution*	Implications for The Antiquity of Raptorial Biting in Pinnipedimorphs: Exploring Mandible Morphology in the *Callorhinus* Lineage
9:30 am	**73-7**	*Wainwright DK, Summers D; Yale University, Harvard University*	Crushing prey in the open ocean: the pharyngeal jaws of lanternfishes
9:45 am	**Coffee Break**		**Grand Ballroom**

8:00 AM – 9:45 AM Session 74 — Lone Star E

Chchchchanging Climate, Part I

Chair: Robert Srygley

8:00 am	**74-2**	*Lenard A, Diamond S; Case Western Reserve University*	Butterfly Traits Resolve Variation in Range Shift Responses to Recent Climate Change
8:15 am	**74-3**	*Srygley RB; USDA-Agricultural Research Service*	Diapause plasticity allows insects to cope with drought at high and low elevations
8:30 am	**74-4**	*Riddell EA, Iknayan KJ, Wolf BO, Beissinger SR; University of California Berkeley, University of New Mexico*	Thermoregulatory costs drive responses of mammal and bird communities to climate change in the Mojave Desert
8:45 am	**74-5**	*Anderson RA; Western Washington University*	Using among-year climate conditions and climate indices to predict consequences for multiple trophic levels: plants, insects and lizards
9:00 am	**74-6**	*Breitenbach AT, Paitz RT, Bowden RM; Illinois State University*	Let's Do the Time-lag Again: Ecologically Relevant Incubation Temperatures Delay the Response of Sex-determining Genes in a Turtle with TSD
9:15 am	**74-7**	*Carter AW, Sheldon KS; University of Tennessee*	The Climate Variability Hypothesis Predicts Thermal Plasticity Across Life Stages of *Onthophagus taurus* Dung Beetles
9:30 am	**74-8**	*Bovo RP, Simon MN, Provete DB, Navas CA, Andrade DV; University of Sao Paulo, University of California Santa Cruz, Federal University of Mato Grosso do Sul*	Intraspecific Variation in Thermal Tolerance and Water Balance of Amphibians Across Subtropical Elevational Gradients
9:45 am	**Coffee Break**		**Grand Ballroom**

8:00 AM – 9:30 AM **Session 75** **Lone Star F**

Building a Better Muscle

Chairs: Alexis Noel, Stephanie Ross

8:00 am	**75-1**	*Nguyen KD, Venkadesan M; Yale University*	Construction and Deconstruction of Muscle Work Loops
8:15 am	**75-2**	*Cooper AN, Martin JC, McDermott WJ, Dulaney SO, Carrier DR; University of Utah, Orthopedic Specialty Hospital*	The Role of Muscle Fascicle Length in the Power *versus* Economy Performance Trade-off
8:30 am	**75-3**	*Wold ES, Roberts TJ, Sleboda DA; Brown University*	Osmotic engine drives shortening in passive skeletal muscle
8:45 am	**75-4**	*Ross SA, Rimkus B, Konow N, Biewener AA, Wakeling JM; Simon Fraser University, University of Massachusetts Lowell, Harvard University*	The Effects of Muscle Internal Mass on the Contractile Behaviour of *In Situ* Rat Plantaris Muscle
9:00 am	**75-5**	*Arias AA, Ball AM, Azizi E; University of California, Irvine*	Passive mechanical properties of crocodilian limb muscles correlate with *in vivo* function
9:15 am	**75-6**	*Noel A, Nadler J; Georgia Tech Research Institute*	Mimicking the load-holding capabilities of muscle using electrostatic layer jamming

9:30 am **Coffee Break** **Grand Ballroom**

8:00 AM – 10:00 AM **Session 76** **Lone Star G**

The Way That I Walk

Chairs: Rob Siddall, Christine Vega

8:00 am	**76-1**	*Wang Y, Othayoth R, Li C; Johns Hopkins University*	Cockroaches bend head and use legs differentially to traverse grass-like beam obstacles
8:15 am	**76-2**	*Zhong B, Schiebel P, Ozkan-Aydin Y, Brown M, Carruthers A, Rieser J, Sponberg S, Goldman D; Goergia Tech*	Coordination of body undulation and leg wave during centipede locomotion, in a geometric perspective
8:30 am	**76-3**	*Vega CM, Ashley-Ross MA; Wake Forest University*	Turtling the salamader: the role of lateral undulation in sprawling limb kinematics
8:45 am	**76-4**	*Turner ML, Gatesy SM; Brown University*	Looking inside the sole: intermetatarsal mobility in the American alligator
9:00 am	**76-5**	*Michel KB, Bishop PJ, Cuff AC, Allen V, Hutchinson JR; Royal Vet College UK*	Skeletal kinematics and muscle function during locomotion in tinamou, *Eudromia elegans*
9:15 am	**76-6**	*Siddall RJD, Jusufi A; Max Planck Institute for Intelligent Systems*	Modulation of Cranio-Caudal mass distribution facilitates obstacle traversal in a cursorial biorobotic model
9:30 am	**76-7**	*Kikel M, Gecelter R, Thompson NE; NYIT College of Osteopathic Medicine*	Evolutionary origins of human pelvic list, hip adduction, and step width
9:45 am	**76-8**	*Gecelter R, Kikel M, Thompson NE; NYIT College of Osteopathic Medicine*	Hip Moments and Muscle Activity During Compensatory Osteoarthritis Gaits

10:00 am **Coffee Break** **Grand Ballroom**

8:00 AM – 10:00 AM **Session 77** **Rooms 301-302**

Ecophysiology of Oxygen Delivery

Chair: Heather Liwanag

8:00 am	**77-1**	*Herndon CJ, Fenton FH; Georgia Institute of Technology*	Corazon espinado: microelectrode closed-loop control in cardiac tissue
8:15 am	**77-2**	*Weitzner EL, Pearson LE, Whoriskey S, Harris HS, Whitmer E, Brodie E, Tomanek L, Johnson S, Liwanag HEM*; Cal Poly San Luis Obispo, Marine Mammal Center, National Marine Mammal Foundation*	Development of Diving Capability in Weddell Seal Pups
8:30 am	**77-3**	*Negrete Jr B, Ackerly KL, Esbaugh AJ; University of Texas Austin Marine Science Institute*	The effect of hypoxia induced hemoglobin switching on aerobic performance in red drum, *Sciaenops ocellatus*
8:45 am	**77-4**	*Martin LM, Esbaugh AJ; University of Texas at Austin, Marine Science Institute*	Recovery from catch-and-release angling in Gulf of Mexico fishes

9:00 am	**77-5**	*Dichiera AM, Esbaugh AJ; University of Texas at Austin, Marine Science Institute*	Red blood cell carbonic anhydrase dictates oxygen delivery rate in red drum (*Sciaenops ocellatus*)
9:30 am	**77-7**	*Harrison JF, Aivazian V, Weed M, Munoz E, Vandenbrooks JM; Arizona State University, Midwestern University*	Hypermetric scaling of the leg tracheal system in cockroaches
9:45 am	**77-8**	*King EE, Stillman JH, Williams CW; University of California, Berkeley, San Francisco State University*	New Zealand Mud Snails Continue Respiring During Severe Oxygen Limitation at Warm Temperatures

10:00 am ..... **Coffee Break** ..... **Grand Ballroom**

8:00 AM – 9:30 AM **Session 78** **Rooms 303-304**

Complementary to S10: Melding Modeling and Morphology: Integrating Approaches to Understand the Evolution of Form and Function, Part I

Chairs: Alexander Hoover, Julien Clavel

8:00 am	**78-1**	*Hoover AP, Katija K; University of Akron, Monterey Bay Aquarium Research Institute*	Manse and Tail: Flow structure and morphological constraints of the filtration feeding mechanisms by giant larvaceans
8:15 am	**78-2**	*Clavel J, Morlon H; Natural History Museum, École Normale Supérieure*	Phylogenetic Signal and Linear Model for High-Dimensional Multivariate Comparative Data: a case study with the MANOVA
8:30 am	**78-3**	*Koehl MAR, Nguyen H, Fauci L; University of California, Berkeley, Trinity University, Tulane University*	Effects of Cell Morphology, Attachment to a Surface, and Colony Formation on the Hydrodynamic Performance of Choanoflagellates
8:45 am	**78-4**	*Darcy HE, Anderson PSL; University of Illinois Urbana-Champaign*	Do aquatic paedomorphs converge in both morphology and performance across phylogeny in Spelerpini Salamanders?
9:00 am	**78-6**	*Weihs D; Technion-Israel Institute of Technology*	Single Layer Fish Schools- for Hunting and Energy Saving
9:15 am	**78-7**	*Naylor ER, Higham TE; University of California, Riverside*	Toes for any occasion: morphological covariation and ecological signal within the gecko attachment system

9:30 am ..... **Coffee Break** ..... **Grand Ballroom**

8:00 AM – 9:45 AM **Session 79** **Room 205**

Parental Care & Reproduction

Chair: Rayna Harris

8:00 am	**79-1**	*Harris RM, Austin SH, Langcalisi A, MacManes M, Calisi RM; NPB, UC Davis, MCB, UNH*	Peaks and valleys of prolactin-related gene expression during the pigeon parental care stage
8:15 am	**79-2**	*Alonge MM, Daniels DT, Schobel T, Bentley GE; University of California, Berkeley*	Flexible Expression of Sickness Behavior and Parental Care Across Stages of Avian Reproduction
8:30 am	**79-3**	*Perez JH, Tolla E, Dunn IC, Meddle SL, Stevenson TJ; University of Glasgow, Roslin Institute, University of Edinburgh*	Neuropsin and VA-opsin both facilitate photoinduction of avian seasonal breeding
8:45 am	**79-4**	*Vernasco BJ, Dakin R, Sisson Z, Haussmann MF, Ryder TB, Moore IT; Washington State University, Carleton University, Bucknell University, Smithsonian Migratory Bird Center, Virginia Tech*	Using Telomeres to Assess Patterns of Biological Aging in a Cooperative Lek-breeding Passerine, the Wire-Tailed Manakin (*Pipra filicauda*)
9:00 am	**79-5**	*Sayavong N, Estrada M, Salas H, Gunderson AR, Stillman JH, Tsukimura B; California State University, Fresno, Tulane University, San Francicso State University*	Effects of preferred temperature, interspecific interactions, and increased population density on vitellogenesis on intertidal crabs *Petrolisthes cinctipes and Petrolisthes manimaculus*
9:15 am	**79-6**	*Lasala JA, Hughes C, Wyneken J; Florida Atlantic University*	Leatherback Turtle Breeding Sex Ratios are 1:1
9:30 am	**79-7**	*Sasson D, Johnson T, Scott E, Fowler-Finn K; Saint Louis University*	Water deprivation affects mating behaviors and outcomes in the harvestman, *Leiobunum vittatum*

9:45 am ..... **Coffee Break** ..... **Grand Ballroom**

8:00 AM – 9:45 AM **Session 80** **Rooms 201-202**

S.T.R.E.S.S. 1

Chairs: Sarah Guindre-Parker, Mike Butler

8:00 am	**80-1**	*Lattin CR, Kelly TR; Louisiana State University*	Method matters: Considerations for calculating glucocorticoid negative feedback
8:15 am	**80-2**	*Hodinka BL, Ashley NT; Simon Fraser University, Western Kentucky University*	Effect of sleep loss on executive function and baseline corticosterone levels in an arctic-breeding songbird, the Lapland longspur (*Calcarius lapponicus*)
8:30 am	**80-3**	*Krause JS, Reid AMA, Perez JH, Bishop V, Ramenofsky M, Wingfield JC, Meddle SL; UN Reno, UC Davis, U Edinburgh, Roslin Institute*	The reduction in negative feedback sensitivity underlies seasonal changes in corticosterone in free-living migrant white-crowned sparrows
8:45 am	**80-4**	*Dantzer B, Van Kesteren F, Palme R, Boutin S, McAdam AG, Lane JE; University of Michigan, University of Veterinary Medicine Vienna, University of Alberta, University of Guelph, University of Saskatchewan*	Disentangling how multiple ecological factors impact glucocorticoids in red squirrels
9:00 am	**80-5**	*Jimeno B, Landry D, Stager M, Wolf C, Prichard M, Cheviron Z, Breuner C; University of Montana*	Metabolic traits, but not corticosterone concentrations, are associated with reproductive investment in tree swallows
9:15 am	**80-6**	*Guindre-Parker S; Kennesaw State University*	Revisiting glucocorticoid plasticity
9:30 am	**80-7**	*Butler MW, Armour EM, Minnick JA, Rossi ML, Schock SF, Berger SE, Hines JK; Lafayette College*	Both Circulating Corticosterone Levels and Heme Oxygenase Expression Are Correlated With Circulating Triglyceride Levels in House Sparrows

9:45 am **Coffee Break** **Grand Ballroom**

8:00 AM – 9:45 AM **Session 81** **Rooms 203-204**

Where Do We Go From Here? Biogeography

Chair: Daniel Spence

8:00 am	**81-1**	*David KT, Fan Z, Halanych CN, Halanych KM; Auburn University*	Are Two Genomes Better Than One? Ploidy Correlates Species' Distributions in South American Frogs
8:15 am	**81-2**	*Costa DP, Huckstadt LA; University of California at Santa Cruz*	Incorporating the movement of Marine Megafauna is critical to developing appropriate marine protected areas
8:30 am	**81-3**	*Firneno TJ, O'Neill JR, Portik DM, Emery AH, Townsend JH, Fujita MK; University of Texas at Arlington, Indiana University of Pennsylvania, University of Arizona*	Mitonuclear discordance Reveals Cryptic Genetic Diversity, Gene Flow, and a Complex Demographic History in a Problematic Complex of Mesoamerican Toads
8:45 am	**81-4**	*Ceja AY, Way MJ, Kane SR; University of California, Riverside, NASA Goddard Institute for Space Studies*	PEACH: The Physiology Exoplanet Astroecology model for Characterizing Habitability
9:00 am	**81-5**	*Feilich KL, Nitta JH, Friedman M; University of Michigan Ann Arbor, Smithsonian Institution*	Distribution of morphological diversity, phylogenetic diversity, and speciation rate of freshwater fishes of the United States
9:15 am	**81-7**	*Kemp ME; University of Texas at Austin*	Extinction, persistence, and resiliency in the Caribbean fossil record
9:30 am	**81-8**	*Ellison CI, Maslakova SA; University of Oregon*	Diversity of Benthic Nemerteans of the Caribbean

9:45 am **Coffee Break** **Grand Ballroom**

8:00 AM – 10:00 AM **Session 82** **Rooms 402-403**

Bio-"Physical Fascination"-Biophysical Environment, Part I

Chair: Micheal Sears

8:00 am	**82-1**	*Howey CAF; University of Scranton, Pennsylvania State University*	Thermoregulation and Foraging Behavior of Timber Rattlesnakes (*Crotalus horridus*) in a Disturbed Landscape
8:15 am	**82-2**	*Steele Cabrera S, Hunt TS, Haddad NM, Lucky A, Daniels JC; University of Florida, Michigan State University*	Measuring the Outcome of Reintroduction Efforts for an Endangered Butterfly

8:30 am	**82-3**	*Lolavar A, Wyneken J; Florida Atlantic University*	The impact of sand moisture on the temperature-sex ratio responses of developing loggerhead (*Caretta caretta*) sea turtles
8:45 am	**82-4**	*Farallo VR, Muñoz MM; Yale University*	Out of time and out of room: Are montane salamanders vulnerable to extinction due to climate change?
9:00 am	**82-5**	*Lark R, Sharabi L, Levy O*; Tel Aviv University, Israel*	The use of remote sensing and models to understand behavioral thermoregulation in dogs
9:15 am	**82-6**	*Powers DR, Lapsansky AB, Shannon ES, Tobalske BW; George Fox University, University of Montana*	Body-Temperature Management by Hovering and Perching Hummingbirds in Cold and Warm Temperatures
9:30 am	**82-7**	*Sears MW, Nussear KE, Simandle ET; Clemson University, University of Nevada, Reno*	Biophysical ecology and the evolution of methods: are they deleterious mutations?
9:45 am	**82-8**	*Morales OJ, Walker N, Warne RW, Boyles JG; Southern Illinois University - Carbondale*	Consequences of pharmacologically induced corticosterone hormone on body temperature and body condition in the banner-tailed kangaroo rat.

10:00 am ..... **Coffee Break** ..... **Grand Ballroom**

10:15 AM – 11:45 AM **Session 83** **Lone Star A**

Complementary to S4: Reproduction: The Female Perspective From an Integrative and Comparative Framework, Part I

Chairs: Nicole Danos, Daniel J. Stadtmauer

10:15 am	**83-1**	*Bilotta F, Lee M, Danos N; University of San Diego*	Pregnancy-induced changes to muscle-tendon morphology and function
10:30 am	**83-2**	*Andreasen VA, Yap KN, Yamada K, Williams A, Zikeli S, Kavazis AN, Hood WR; Auburn University*	The impact of maternal corticosterone on offspring morphology and mitochondrial physiology
10:45 am	**83-3**	*Stadtmauer DJ, Chavan AR, Wagner GP; Yale University*	Baby Light My Fire: "Cooperative Inflammation" in Marsupial Pregnancy
11:00 am	**83-4**	*Million KM, Proffitt MR, Reese SJ; Indiana University, Bloomington, Howard University*	MHC-based Olfactory Signals and Mate Choice in Darters (*Etheostoma*)
11:15 am	**83-5**	*Reese SJ, Million KM, Proffitt MR; Howard University, Indiana University*	Response to Visual and Olfactory Stimuli in Darters (*Etheostoma*) during Mate Choice Trials
11:30 am	**83-6**	*Stiller AB, Staub NL; Whitman College, Gonzaga University*	Not a surprise: Female salamanders (plethodontid species *Aneides ferreus*) communicate to males during courtship as evidenced by courtship-like glands on their dorsum

11:45 am ..... **Lunch Break**

10:15 AM – 11:45 AM **Session 84** **Lone Star B**

Awesome Adaptations

Chairs: Anthony Lapsansky, Dana Orbach

10:15 am	**84-1**	*Sombke A, Mueller CHG; University of Vienna, University of Greifswald*	Evolutionary transformations of centipede ultimate legs
10:30 am	**84-2**	*Weller HI, López-Fernández H, McMahan CD, Brainerd EL; Brown University, University of Michigan, Field Museum of Natural History*	The spandrels of Satan's perches: evidence for the co-optation of feeding traits in the convergent evolution of mouthbrooding in Neotropical cichlids
10:45 am	**84-3**	*Freymiller GA, Schwaner MJ, Whitford MD, McGowan CP, Higham TE, Clark RW; San Diego State University, University of Idaho, University of California, Riverside*	Determining the functional significance of bipedalism in heteromyid rodents through comparisons of morphology and performance
11:00 am	**84-4**	*Smith SM, Angielczyk KD, Kerbis Peterhans JC; Field Museum of Natural History*	Vertebral number and spinal regionalization in large shrews (Soricidae)
11:15 am	**84-5**	*Orbach DN, Brennan PLR, Hedrick BP, Keener W, Webber M, Mesnick SL; Texas A&M University, Mount Holyoke College, University of Oxford, Golden Gate Cetacean Research, Southwest Fisheries Science Center*	Unique Coevolution of Genital Asymmetry and Lateralized Mating Behavior in A Mammal
11:30 am	**84-6**	*Lapsansky AB, Tobalske BW; University of Montana*	The biomechanics of multi-functional wings in diving birds

11:45 am ..... **Lunch Break**

10:15 AM – 11:45 AM **Session 85** **Lone Star C**

Chew on This

Chairs: Francois Gould, Nicolai Konow

10:15 am	**85-1**	*Konow N, Panessiti C, Schwarz D, Bouvier C, Marbelt-Rodriguez C, Heiss E, Ross CF, Rull M; UMass Lowell, U Jena, U Chicago*	Food processing across the fish-tetrapod split
10:30 am	**85-2**	*Lomax JJ, Brainerd EL; Brown University*	Comparative Skeletal Kinematics of Overbite-Shearing and Compressive Chewing Cycles in a Pacu Fish, *Piaractus brachypomus*
10:45 am	**85-3**	*Beery SM, Olson RA, Montuelle SJ, Williams SH; Ohio University*	Effect of food properties on molar occlusion during chewing in pigs
11:00 am	**85-4**	*Olson RA, Curtis HE, Williams SH; Ohio University*	To chew or not to chew: a comparison of the 3D kinematics of feeding and drinking in pigs
11:15 am	**85-5**	*Laurence-Chasen JD, Junod RM, Hatsopoulos NG, Arce-McShane F, Ross CF; University of Chicago*	Geometric morphometric analysis of tongue shape dynamics during feeding in *Macaca mulatta*
11:30 am	**85-6**	*Gould FDH, Lammers A, Mayerl CJ, German RZ; Rowan University, Cleveland State University, Northeast Ohio Medical University*	Differential Effect of Superior and Recurrent Laryngeal Nerve Lesion on Kinematics and Performance in Mammalian Swallowing
11:45 am		**Lunch Break**	

10:30 AM – 12:00 PM **Session 86** **Lone Star E**

Chchchchanging Climate, Part II

Chair: Sara ElShafie

10:30 am	**86-1**	*Rahman MS, Rahman MS; University of Texas Rio Grande Valley*	Effects of Heat Exposure on Antioxidant Expression and Redox Status in the American Oyster: A Laboratory Study
10:45 am	**86-2**	*Mikucki E, Buchanan J, Julick C, Montooth K, Lockwood B; University of Vermont, Vanderbilt University, University of Nebraska - Lincoln*	The Effects of Winter Warming Stress on Metabolic Activity in Diapausing *Pieris rapae* Butterflies
11:00 am	**86-3**	*Fleming JML, Carter AW, Sheldon KS; University of Tennessee*	Beetle Pupae Show Tradeoff Between Metabolic Depression and Body Size in Response to Increased Temperature Mean and Variance
11:15 am	**86-4**	*Lee MA, Densmore III LD; Texas Tech University*	Past, Present, and Future Distributions of *Agkistrodon contortrix*
11:30 am	**86-5**	*Lyons MP, Von Holle B, Weishampel JF; University of Central Florida, National Science Foundation*	Impacts of Climate and Flooding on Current and Future Sea Turtle Nest Survival in the Eastern United States
11:45 am	**86-6**	*Elshafie SJ; University of California, Berkeley*	Body Size Changes Across Lizards and Crocodylians Correspond to Climatic Changes Through Deep Time
12:00 pm		**Lunch Break**	

10:00 AM – 12:00 PM **Session 87** **Lone Star F**

(Don't) Trip, Stumble and Fall

Chair: Cinammon Pace

10:00 am	**87-1**	*Vazquez S, Phan A, Joseph M, Pace CM*; Le Moyne College*	The aerial righting ability of the brown marmorated stink bug, *Halyomorpha halys*.
10:15 am	**87-2**	*Su GT, Dudley R, Pan TY, Zheng MZ, Peng LS, Li QS; Beihang University, University of California, Berkeley, Xihua University*	Maximum Aerodynamic Force Production by the Wandering Glider Dragonfly (*Pantala Flavescens*, Libellulidae)
10:30 am	**87-3**	*Gemilere R, Lds-Vip, Gau JF, Sponberg S; Georgia Tech*	Wingbeat frequency modulation to large lateral perturbations in hawkmoths
10:45 am	**87-4**	*Xuan Q, Li C; Johns Hopkins University*	Template model reveals mechanism of wing and leg coordination during self-righting of a cockroach-inspired robot
11:00 am	**87-5**	*Ortega-Jimenez VM, Sanford CP; Kennesaw State University*	Beyond the Kármán Gait: Knifefish swimming responses to complex wakes shed by a free oscillating cylinder

11:15 am	**87-6**	*Fath M, Nasimi F, Tytell E; Tufts University*	Kinematic responses to rolling perturbations during swimming in the bluegill sunfish
11:30 am	**87-7**	*Stinson HM, Mukherjee R, Tytell ED, Schwalbe MAB; Lake Forest College, Tufts University*	Lateral line and visual systems in bluegill sunfish (*Lepomis macrochirus*) contribute to regaining stability in horizontal vortices
11:45 am	**87-8**	*Stevenson JPJ, Cheney JA, Durston NE, Usherwood JR, Windsor SP, Bomphrey RJ; University of Bristol, Royal Veterinary College*	Avian wing suspension for gust rejection

12:00 pm **Lunch Break**

10:30 AM – 12:00 PM Session 88 — Lone Star G

Morphology of the Senses

Chairs: Kelsi Rutledge, Katie Thomas

10:30 am	**88-1**	*Uhrhan MJ, Fabian JM, Siwanowicz I, Lin HT; Imperial College London, HHMI Janelia Research Campus*	Mechanosensors on Dragonfly Wings for sensing Aeroelasticity
10:45 am	**88-2**	*Mikel-Stites MR, Staples AE, Marek P; Virginia Tech*	Hearing Better When Lopsided: Tympanal Asymmetry May Enhance Hearing in the Parasitoid Fly *Ormia ochracea*
11:00 am	**88-3**	*Rutledge KM; University of California Los Angeles*	Sniffing out batoid nasal morphology: a model for classification with functional implications
11:15 am	**88-4**	*Thomas KN, Gower DJ, Bell RC, Fujita MK, Schott RK, Streicher JW; Natural History Museum, Smithsonian National Museum of Natural History, University of Texas at Arlington*	Ecological Correlates of Eye Size in Frogs and Toads
11:30 am	**88-5**	*Hall RP, Mutumi GL, Hedrick BP, Yohe LR, Sadier A, Davies KTJ, Dávalos LM, Rossiter SJ, Sears K, Dumont ER; University of California Merced, Louisiana State University, Yale University, University of California Los Angeles, Queen Mary University of London, Stony Brook University*	Ancestral Generalization as a Potential Gateway to Rapid Dietary Divergence in Neotropical Leaf-Nosed Bats
11:45 am	**88-6**	*Murphy CT, Lyons KM, Haddock WA, Martin WN, Hellum AM, Breuer KS, Franck JA; US Navy, University of Wisconsin-Madison, Brown University*	Feature Variations in Seal Whisker Geometries and the Effect on Vortex Structure

12:00 pm **Lunch Break**

10:30 AM – 12:00 PM Session 89 — Rooms 301-302

Host-pathogen Interactions

Chairs: Karie Altman, Amberleigh Henschen

10:30 am	**89-1**	*Saenz V, Richards Zawacki C; University of Pittsburgh*	What role do ephemeral ponds play in the amphibian disease landscape?
10:45 am	**89-2**	*Richardson CS, Looney C, Ineson K, Foster J, Sillah A, Eiseman H; Lesley University, Northeastern University, University of New Hampshire, University of Massachusetts-Amherst, Tufts University*	Understanding the Role of Intrinsic Physiological Factors in the Population Recovery of *Myotis lucifugus* (little brown myotis) from White-nose Syndrome
11:00 am	**89-3**	*Billah MM, Rahman MS; University of Texas Rio Grande Valley*	Detection and Enumeration of Bacterial Pathogens in the American Oyster, *Crassostrea virginica*
11:15 am	**89-4**	*Kollath DR, Teixeira MM, Miller KJ, Bridget BM, Funke A; Northern Arizona University, University of Brasília Campus Universitário Darcy Ribeiro*	Investigating the Role of Animal Burrows on the Ecology and Distribution of Coccidioides spp. in Arizona Soils.
11:30 am	**89-5**	*Altman KA, Hall EM, Rollins-Smith LA, Ohmer MEB, Richards-Zawacki CL; University of Pittsburgh, Vanderbilt University*	Effects of pond drying on northern leopard frog development, growth, immune function, and susceptibility to *Batrachochytrium dendrobatidis*
11:45 am	**89-6**	*Henschen AE, Hawley DM, Adelman JS; University of Memphis, Virginia Tech*	Oxidative damage resistance as a potential mechanism of disease tolerance in a wild host

12:00 pm **Lunch Break**

10:15 AM – 12:00 PM **Session 90** **Rooms 303-304**

Complementary to S10: Melding Modeling and Morphology: Integrating Approaches to Understand the Evolution of Form and Function, Part II

Chairs: Stacy Farina , Micheal Granatosky

10:15 am	**90-1**	*Clark EG, Hutchinson JR, Bishop PJ, Briggs DEG; Yale University, Royal Veterinary College*	Investigating the Locomotion of an Early Deuterostome through 3D Imaging and Digital Modeling
10:30 am	**90-2**	*Granatosky MC, Laurence-Chasen JD, Gartner SM, Whitlow KR, Westneat MW, Nyakatura JA; New York Institute of Technology, University of Chicago, Humboldt-Universität zu Berlin*	An XROMM and kinetic analysis of underwater walking in the West African lungfish (*Protopterus annectens*) with implications for the role of quadrupedal gaits during the fin-to-limb transition
10:45 am	**90-3**	*Schuech R, Tor Nielsen L, Humphries S, Smith D, Kiørboe T; University of Lincoln, Technical University of Denmark, University of Birmingham*	Hydrodynamics Shed Light on Dinoflagellate Evolution
11:00 am	**90-4**	*Chan KYK, Wong E, Wong JY, Xu K, Koehl MAR; Swarthmore College, Hong Kong University of Science and Technology, Academia Sinica, University of California, Berkeley*	Hydrodynamics of barnacle nauplii shape evolution of body form
11:15 am	**90-5**	*Farina SC, Amacker K, Chennault M, Gibb AC; Howard University, Northern Arizona University*	Kinematic integration of gill chamber pumping with body movements during burial in two morphologically disparate fish species
11:30 am	**90-6**	*Wood H; Smithsonian Institution*	Reverse engineering the “trap-jaw” mechanism in spiders (Araneae, Mecysmaucheniidae)
11:45 am	**90-7**	*Storch JD, Hernandez LP; George Washington University*	Constraining the Power Stroke of Premaxillary Protrusion: The Evolution of Diverse Cranial Musculature in Cypriniform Fishes

12:00 pm **Lunch Break**

10:15 AM – 12:00 PM **Session 91** **Room 205**

Sensory Basis of Organismal Interactions

Chair: Rulon Clark

10:15 am	**91-1**	*Jiao Y, Colvert B, Man Y, McHenry M, Kanso E; University of Southern California, University of California Irvine*	Evaluating Evasion Strategies in Zebrafish Larvae
10:30 am	**91-2**	*Wood TC, Moore PA; Bowling Green State University, University of Michigan Biological Station*	Chemical Landscapes of Fear: Crayfish can Determine the Degree of Predatory Threat by Olfaction Alone
10:45 am	**91-3**	*Friesen CN, Han J, Young RL, Hofmann HA; UT Austin*	Using correlated patterns of behavioral and molecular variation to understand individual variation
11:00 am	**91-4**	*Otter K, Katz PS; University of Massachusetts Amherst*	Hunger state modulates the decision of a nudibranch to pursue or evade hazardous prey
11:15 am	**91-5**	*Olenski MS, Bilbrey C, Dirienzo N, Dornhaus A; University of Arizona*	The Effect of Neurotransmitters on Life History Strategy: How do Increased Dopamine Levels Influence Aggression in Black Widow Spiders?
11:30 am	**91-6**	*Harris BN, Prater CM, Lockwood R, Kennedy A, Carr JA; Texas Tech University*	Now You See It, Now You Don’t: Role of Tectal CRF Administration on Visually Guided Feeding Behavior
11:45 am	**91-7**	*Robinson KE, Holding ML, Clark RW*; San Diego State University, Florida State University*	Biochemical Warfare: The Coevolution of Rattlesnake Venom and Venom Resistance in Prey Species

12:00 pm **Lunch Break**

10:15 AM – 11:45 AM **Session 92** **Rooms 201-202**

S.T.R.E.S.S. 2

Chairs: Mauren Vitousek, Blake Jones

10:15 am	**92-1**	*Ensminger DC, Pritchard C, Gingery T, Langkilde T; University of California Berkeley, Pennsylvania State University*	The influence of hunting pressure and ecological factors on fecal glucocorticoid metabolites in wild elk
10:30 am	**92-2**	*Kimball MG, Grant AR, Chrisler A, Johnson E, Malisch JL; Louisiana State University, University of Nevada, St Mary's College of Maryland*	Acute Stress Mobilizes Glucose and Free Fatty Acids in Mountain Dark-eyed Juncos (*Junco hyemalis*)
10:45 am	**92-3**	*Wolf SE, Beltran SE, Sanders TL, Rosvall KA; Indiana University, Dominican University, Oklahoma State University*	Telomere protection mechanisms and adaptive organismal responses to early postnatal stress
11:00 am	**92-4**	*Choi W, Wada H; Auburn University*	Eggshell Pore Density as an Important Determinant for Avian Embryonic Development
11:15 am	**92-5**	*Da Silva DP, Gomes FR; University of Sao Paulo*	Interplay between personality, physiology, and temperature in American bullfrogs
11:30 am	**92-6**	*Jones BC, Duval EH; Florida State University*	Development of the glucocorticoid stress response and its effects on growth in a tropical passerine

11:45 am **Lunch Break**

10:30 AM – 12:00 PM **Session 93** **Rooms 203-204**

Migration and Navigation

Chair: Jessica Malisch

10:30 am	**93-1**	*Taylor LD, Finnegan S, O'Dea A, Bralower TJ; University of California Berkeley, Smithsonian Tropical Research Institute, Pennsylvania State University*	Isotopic Analysis of Fossil Coronulid Barnacles as a Means of Understanding Prehistoric Whale Migration
10:45 am	**93-2**	*Malisch JL, Hahn TP, Breuner CW; St Mary's College of Maryland, University of California Davis, University of Montana*	Should I Stay Or Should I Go Now? Predictors of Facultative Altitudinal Migration in Mountain White-crowned Sparrows (*Zonotrichia leucophrys oriantha*)
11:00 am	**93-3**	*Ramenofsky M, Pradhan D, Austin SH, Soma K, Schlinger B; University of California Davis, Idaho State University, Oregon State University, University of British Colulmbia, University of California Los Angeles*	Phenotypic Flexibility of Glucocorticoid Signaling in Skeletal Muscles of White-crowned Sparrows Preparing to Migrate
11:15 am	**93-4**	*Bowers ME, Kajiura SM*; Florida Atlantic University*	There and back again; a blacktip's tale
11:30 am	**93-5**	*Desimone JG, Tobalske BW, Breuner CW; University of Montana Missoula*	Prepare or Escape?: The Behavioral, Physiological, and Hormonal Responses of a Facultative Migrant to Declining Food Availability
11:45 am	**93-6**	*Buo C, Taylor E, Bartles J, Christman K, Dayal P, Londraville RL; University of Akron*	Spatial mapping and visual cues influence navigation in *Entomacrodus striatus*

12:00 pm **Lunch Break**

10:30 AM – 11:30 AM **Session 94** **Rooms 402-403**

Bio-"Physical Fascination"-Biophysical Environment, Part II

Chair: George Bakken

10:30 am	**94-1**	*Tilman FE, Bakken GS*, O'Keefe JM; Indiana State University*	Assessing the Thermal Quality of Artificial Roosts for Conservation of Gregarious Bat Species
10:45 am	**94-2**	*Busby MK, Davidowitz G, Bronstein JL; University of Arizona*	Thermolimit Respirometry Determines Relative CTmax Among Carpenter Bee Life Stages
11:00 am	**94-3**	*Short RA, Lawing AM; Texas A&M University*	Locomotor morphology of ungulate communities as an environmental predictor
11:15 am	**94-4**	*Forsburg ZR; Texas State University*	Effects of artificial light at night and predator presence on the development, growth, and physiology of *Rana berlandieri*

11:30 am **Lunch Break**

Monday Program Afternoon Sessions

Note: Presenter is first author unless noted by an asterisk (*).

1:30 PM – 3:30 PM **Session 95** **Lone Star A**

Complementary to S4: Reproduction: the Female Perspective from an Integrative and Comparative Framework, Part II

Chairs: Ned J. Place, Kristen J. Navara

1:30 pm	**95-1**	*Plakke MS, Meslin C, Arikawa K, Clark NL, Morehouse NI; University of Kansas, INRA, SOKENDAI, University of Utah, University of Cincinnati*	A recent, lineage-specific, co-option event within the female reproductive tract of the Cabbage White butterfly, *Pieris rapae* L.
1:45 pm	**95-2**	*Levell ST, Reznick DN; University of California, Riverside*	Can Mothers Diferentially Allocate Resources to Offspring Sired by Different Males?
2:00 pm	**95-3**	*Rosvall KA, Lipshutz SE; Indiana University, Bloomington*	Obligate cavity-nesting shapes the evolution of territorial aggression, but not testosterone, in both female and male birds
2:15 pm	**95-4**	*George EM, Rosvall KA; Indiana University Bloomington*	How social challenges modulate steroid signaling in the female brain
2:30 pm	**95-5**	*McEntee M, Krzyszczyk E, Foroughirad V, Frère C, Mann J; Georgetown University, University of the Sunshine Coast*	Fitness and mortality costs to females in a system with allied sexual coercion
2:45 pm	**95-6**	*Crosier AE, Bapodra P, Santiestevan J, Comizzoli P, Place NJ*; Smithsonian Conservation Biology Institute, Columbus Zoo and Aquarium, Cornell University*	Anti-Müllerian hormone as a predictor of responses to ovarian stimulation in cheetahs, *Acinonyx jubatus*
3:00 pm	**95-7**	*McDonough CE, Pitnick S, Dorus S; Syracuse University*	Molecular evolution and sex-biased expression of *Drosophila melanogaster* female reproductive tract tissues
3:15 pm	**95-8**	*Navara KJ, Wrobel ER, Bentz AB, Lorenz WW, Gardner S, Mendonça MT; University of Georgia, Indiana University, Bloomington, Auburn University*	Corticosterone treatment influences expression of gene pathways linked to meiotic segregation in preovulatory follicles of the domestic hen

3:30 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:30 PM **Session 96** **Lone Star B**

Complementary to S5: Form, Structure and Function: How Plants vs. Animals Solve Physical Problems

Chairs: James C Liao, Saad Bhamla

1:30 pm	**96-1**	*Matthews M, Crowley CJ, Aiello BR, Sikandar UB, Sponberg S; Georgia Tech*	The Answer is Blowing in the Wind: Flower Wake Downwash Can Reduce Aerodynamic Forces in Insect Flight
1:45 pm	**96-2**	*Liao JC, Akanyeti O; University of Florida, Aberystwyth University*	How fishes use body wave interference to accelerate
2:00 pm	**96-3**	*Lenz AS; University of Bristol*	Structural Adaptations of *Nepenthes gracilis* Pitcher Lids to Capture Insects Using Drop Impacts
2:15 pm	**96-4**	*Alexander SLM, Bhamla MS*; Georgia Institute of Technology*	Ultrafast and underdamped: Slingshot spiders design conical webs for ambush predation and self-survival
2:30 pm	**96-5**	*Golos MR, Bauer U; University of Bristol*	Wettability of Pitcher Plant Trapping Surfaces
2:45 pm	**96-6**	*McCaskey EN, Lehner K, Taylor I, Benfey PN, Goldman DI; Georgia Tech, Duke University*	Rice Root Tip Circumnutation Facilitates Exploratory Behavior
3:00 pm	**96-7**	*Wan KY; University of Exeter*	Gait Rhythmogenesis and Spatiotemporal Ordering in Self-propelling Unicellular Microorganisms
3:15 pm	**96-8**	*Ozkan-Aydin Y, Goldman DI, Bhamla MS; Georgia Institute of Technology*	Collective Behavior of Worm Blobs

3:30 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:15 PM **Session 97** **Lone Star C**

Everything Sucks

Chairs: Aaron Olsen, Roi Holzman

1:30 pm	**97-1**	*Hernandez LP, Olsen AM, Brainerd EL; George Washington University, Brown University*	Convergent means of breaking constraint: How alternative means of premaxillary protrusion have allowed fishes to break functional constraints
2:00 pm	**97-3**	*Olsen AM, Hernández LP, Brainerd EL; Brown University, George Washington University*	A 13-bar linkage model of the channel catfish skull and the degrees of freedom needed to suction feed
2:15 pm	**97-4**	*Whitlow KR, Ross CF, Westneat MW; University of Chicago*	Strike biomechanics in *Polypterus bichir* described with XROMM: implications for actinopterygian feeding evolution
2:30 pm	**97-5**	*Gartner SM, Whitlow KR, Laurence-Chasen JD, Granatosky MC, Ross RC, Westneat MW; University of Chicago, New York Institute of Technology*	Suction feeding of the African Lungfish, Protopterus annectens; XROMM analysis of jaw mechanics, cranial kinesis, and hyoid mobility in a novel feeding mechanism.
2:45 pm	**97-6**	*Kane EA, Higham TE; Georgia Southern University, UC Riverside*	Apparent modulation of integration with prey type in bluegill is driven by individual differences in performance and its integration
3:00 pm	**97-7**	*Holzman R, Eyal M, Malul D, Jacobs C; Tel Aviv University, Technion*	You suck, We suck, Everyone sucks: *Homo sapiens* display poor suction feeding performance

3:15 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:30 PM **Session 98** **Lonestar E**

Population Genetics

Chair: Christopher Martine

1:30 pm	**98-1**	*Frolova AD, Miglietta MP; Texas A&M University at Galveston*	Environmental tolerance ranges and limits suggest differences in habitat preference and resilience to climate change among jellyfish (Class Scyphozoa) congeners in the Gulf of Mexico
1:45 pm	**98-2**	*Halsey MK, Stuhler JD, Bradley RD, Stevens RD, Ray DA; Texas Tech University, Museum of Texas Tech*	Temporal and Spatial Genetic Assessment of a Natural Metapopulation
2:00 pm	**98-3**	*McDonnell AJ, Moore CL, Schuette S, Martine CT*; Chicago Botanic Garden, Bucknell University, Western Pennsylvania Conservancy*	A harbinger of good things to come in academic/ non-academic partnerships: Population genomics and conservation of *Erigenia bulbosa* (Apiaceae) in Pennsylvania.
2:15 pm	**98-4**	*Hale HJ, Pokorny L, Gardner EM, Slimp M, Johnson MG; Texas Tech University, Center for Biotechnology and Genomics, Case Western University*	Developing a cost-effective workflow for high-throughput targeted sequencing of herbarium specimens using Angiosperms353
2:30 pm	**98-5**	*Whelan NV, Williams AS, Redak CA, Wright AA, Garrison NL, Halanych KM, Johnson PD, Garner JT; US Fish and Wildlife Service, Auburn University, Tuskegee University, Alabama Department of Conservation and Natural Resources*	Habitat Preference and Impoundments Influence Population Genetic Patterns of Freshwater Gastropods
2:45 pm	**98-6**	*Resh CA, Benesh KC, Mahon AR; Central Michigan University*	Sourcing Invaders: A Northern Snakehead Story
3:00 pm	**98-7**	*Orton RW, Schield DR, Nikolakis ZL, Perry BW, Demuth JP, Mackessy SP, Smith CF, Meik JM, Castoe TA; University of Texas at Arlington, University of Northern Colorado, Tarleton State University*	The landscape of diversity and divergence across genomes highlights links between genome structure and evolution in the formation of genomic islands
3:15 pm	**98-8**	*Johnson KM, Sirovy KA, Kelly MW; Louisiana State University*	Variation in DNA Methylation and Gene Expression Between and Within Families of the Eastern Oyster *Crassostrea virginica*

3:30 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:15 PM **Session 99** **Lone Star F**

Pulling and Tugging: Musculo-Skeletal Architecture

Chairs: Audrey Biondi, David Ryan

1:30 pm	**99-1**	*Osgood AC, Sutton G, St. Pierre R, Cox SM*; Mount Holyoke College, University of Bristol, Carnegie Mellon University, Penn State*	More evidence against a force-velocity trade-off in dynamic lever systems
1:45 pm	**99-2**	*Ryan DS, Dominguez S, Nigam N, Wakeling JM; Simon Fraser University*	Mechanisms that Relate Transverse Loading of Muscle to Change in Contractile Performance
2:00 pm	**99-3**	*Kehl CE, Wu J, Lu S, Drushel RF, Smoldt RK, Chiel HJ; University of North Carolina at Chapel Hill, Case Western Reserve University*	Effect of the Sub-radular Fibers on Grasper Opening in *Aplysia californica*
2:15 pm	**99-4**	*Biondi AA, Amplo HE, Crawford CH, Bemis KE, Flammang BE; New Jersey Institute of Technology, Virginia Institute of Marine Science*	Adventures in scaling and remodeled morphology: the case of the Ocean Sunfish
2:30 pm	**99-5**	*Fraser CJ, Hill EC, Butler MA; University of Hawaii*	Morphological Variation between Terrestrial and Semi-Aquatic Papuan Microhylid Frogs visualized through DiceCTs and Dissection
2:45 pm	**99-6**	*Wilken AT, Middleton KM, Sellers KC, Cost IN, Holliday CM; University of Missouri*	Functional Morphology of the Palate of *Varanus exanthematicus* and its Significance for the Evolution of Cranial Kinesis
3:00 pm	**99-7**	*Cuff AR, Bishop PJ, Michel KB, Gaignet R, Hutchinson JR*; Royal Veterinary College*	Anatomically Grounded Estimation of Limb Muscle Sizes in Archosauria

3:15 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:30 PM **Session 100** **Lone Star G**

Physiology Through the Seasons

Chairs: David Swanson, Kevin Roberts

1:30 pm	**100-1**	*Roberts KT, Williams CM; Univ of California, Berkeley*	A gradual release of metabolic suppression during diapause termination in a montane insect
1:45 pm	**100-2**	*Melicher DM, Yocum GD, Rinehart RP; USDA ARS*	Transcriptomic response to long-term storage under a fluctuting thermal regime in *Drosophila melanogaster*
2:00 pm	**100-3**	*Rowsey LE, Reeve C, Savoy T, Speers-Roesch B; University of New Brunswick*	Thermal Constraints on Anaerobic Exercise and Aerobic Performance are Not Major Drivers of Winter Dormancy in Cunner
2:15 pm	**100-4**	*Ramirez RW, Riddell EA, Wolf BO; University of New Mexico, University of California, Berkeley*	Seasonal and geographical variation in thermoregulatory performance of Cricetid rodents in the Mojave desert
2:30 pm	**100-5**	*Stager M, Senner NR, Tobalske BW, Cheviron ZA; University of Montana, University of South Carolina*	What makes the Snow Bird fit for winter? The mechanisms underlying seasonal physiological flexibility
2:45 pm	**100-6**	*Eberts ER, Guglielmo CG, Welch KC; University of Toronto Scarborough, University of Western Ontario*	Seasonal Changes in Body Composition and Torpor Use of Ruby-throated Hummingbirds (*Archilochus colubris*)
3:00 pm	**100-7**	*Swanson DL, Oboikovitz P; University of South Dakota*	Environmental Heterogeneity and Metabolic Flexibility in Horned Larks and House Sparrows: A Test of the Climatic Variability Hypothesis
3:15 pm	**100-8**	*Elowe CR, Gerson AR; University of Massachusetts Amherst*	Flux Capacity: Seasonal Changes in Body Composition and Metabolism in Migratory White-Throated Sparrows (*Zonotrichia albicollis*)

3:30 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:30 PM **Session 101** **Rooms 301-302**

Two to tango: Host-parasite interactions

Chairs: Susan Balenger, Christian Cox

1:30 pm	**101-1**	*Balenger SL, Sikkink K, Zuk M, Bailey NW; University of Mississippi, St Andrews University*	Fitness consequences and immunogenetic strategies against a novel parasitoid in a field cricket

1:45 pm	**101-2**	*Conrad H, Wittman T, Pollock N, John-Alder H; Rutgers University, University of Texas, University of Virginia*	Tolerance of ectoparasitism in Eastern Fence Lizards, *Sceloporus undulatus*
2:00 pm	**101-3**	*Fuess LE, Weber JN, Steinel NC, Den Haan S, Bolnick DI; University of Connecticut, University of Alaska Anchorage, University of Massachusetts Lowell, University of Texas*	Transcriptomic analyses of *Gasterosteus aculeatus* parasite response reveal mechanisms of resistance
2:15 pm	**101-4**	*Talbott KM, Soini HA, Novotny MV, Whittaker D, Higgins B, Ketterson ED; Indiana U, Michigan State U*	Does Haemosporidian infection status influence volatile composition of avian preen oil?
2:30 pm	**101-5**	*Cox CL, Rosso AA, Nicholson DJ, McMillan WO, Logan ML; Florida International University, Georgia Southern University, Queen Mary University London, Smithsonian Tropical Research Institute, University of Nevada-Reno*	Sex-biased Parasitism and the Expression of a Sexual Signal in a Tropical Forest Lizard
2:45 pm	**101-6**	*Rudzki EN, Kohl KD, Stephenson JF; University of Pittsburgh*	Skin Microbiome Significantly Predicts Susceptibility to Ectoparasite Infection in Trinidadian Guppies, *Poecilia reticulata*
3:00 pm	**101-7**	*Sandmeier FC, Leonard KL, Weitzman CL, Tracy CR, Bayer B, Bauschlicher S; Colorado State University, Virginia Polytechnic Institute and State University, University of Nevada*	Indirect, facultative interaction between a commensal microbe and an opportunistic pathogen in the tortoise respiratory tract
3:15 pm	**101-8**	*Kelly TR, Boyer A, MacDougall-Shackleton EA, MacDougall-Shackleton SA; Louisiana State University, Western University*	Experimental acute-phase immune activation in migratory sparrows has host-antigen specific effects on body mass and migratory restlessness

3:30 pm ..... **Coffee Break** ..... **Grand Ballroom**

1:30 PM – 3:30 PM **Session 102** **Rooms 303-304**

Ecophysiology of Diet

Chair: Beck Wehrle

1:30 pm	**102-1**	*Yang ZY, Easy RH, Avery TA; Acadia University*	Identification and quantification of Atlantic Salmon *Salmo salar*, Arctic char *Salvelinus alpinus*, Cod *Gadus morhua*, and Capelin *Mallotus villosus* in Striped Bass diets in Labrador
1:45 pm	**102-2**	*Littler A, Garcia M, Teets N; University of Kentucky*	Does a Well-Balanced Diet Keep You Going When the Going Gets Cold?
2:00 pm	**102-3**	*Trevelline BK, Maier M, Martínez-Mota R, Derting T, Pasch B, Dearing MD, Kohl KD; Univ of Pittsburgh, Univ of Utah, Murray State Univ, Northern Arizona Univ*	Investigating the mechanisms of diet-induced metabolic depression in wild rodents
2:15 pm	**102-4**	*Muhammad S, Dick MF, Welch KC; University of Toronto*	Sugar Flux and Metabolism in the Ruby-Throated Hummingbird.
2:30 pm	**102-5**	*Azzolini JA, Denardo DF; Arizona State University*	Effect of elevated glucose intake on physiological biomarkers
2:45 pm	**102-6**	*Sandfoss MR, Claunch NM, Stacy NI, Romagosa CM, Lillywhite HB; University of Florida*	A tale of two islands: stress response and immune function of an insular pit viper following ecological disturbance.
3:00 pm	**102-7**	*Frazier AJ, Jensen NR, Young SP, Cooley-Rieders CC, Todgham AE; University of California Davis, Kootenai Tribe of Idaho*	Does a Cannibal Feeding Strategy Impart Differential Metabolic Performance in Young Burbot *Lota lota*?
3:15 pm	**102-8**	*Wehrle BA, Gonzalez AX, Stone J, Rankins D, Vuu E, Herrel A, Tadic Z, German D; UC Irvine, MNHN/CNRS, U Zagreb*	Do digestive enzyme activities explain increased plant digestibility in a newly omnivorous lizard?

3:30 pm ..... **Coffee Break** ..... **Grand Ballroom**

1:30 PM – 3:15 PM **Session 103** **Room 205**

Sensing and Navigation

Chairs: Jeff Riffell , Tanvi Deora

1:30 pm	**103-1**	*Johnson TL, Defino NJ, Rauscher MJ, Heckscher ES, Fox JL; Case Western Reserve University, University of Arizona, University of Chicago*	Interneurons for Mechanosensory Processing in Adult *Drosophila*
1:45 pm	**103-2**	*Sprayberry JDH; Muhlenberg College*	Compounds without borders: a novel paradigm for quantifying complex odors and responses to scent-pollution in bumblebees
2:00 pm	**103-3**	*Riffell J, Chan J, Okubo R; University of Washington*	Sensory biology of of mosquito-flower interactions
2:15 pm	**103-4**	*Bakken GS, Schraft HA, Orduno-Baez A, Clark RW; San Diego State Univ*	Temperature Dependences and Angular Resolution of the Pacific Rattlesnake Facial Pit.
2:30 pm	**103-5**	*Lohmann KJ, Brothers JR, Lohmann CMF; University of North Carolina at Chapel Hill*	No Place Like Home: Sea Turtles and Geomagnetic Imprinting
2:45 pm	**103-6**	*McEntire KD, Poljan M, Vela S, Thompson ML, Baum A; Trinity University*	Do I Match? Exploring Self-Awareness of Color for Background Matching in Texas Horned Lizards
3:00 pm	**103-7**	*Deora T, Brunton BW, Ahmed M, Daniel TL; University of Washington*	*Tactile active sensing and learning in plant-insect pollination*

3:15 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:00 PM **Session 104** **Rooms 201-202**

Comparative Endocrinology

Chairs: Stefanny Titon, Nick Holloway

1:30 pm	**104-1**	*Titon SCM, Titon Jr. B, Teixeira RV, Lima AS, Garcia Neto PG, Ferreira LF, Assis VR, Gomes FR, Markus RP; University of São Paulo, University Center Fundação Santo Andre*	Immune and hormonal circadian rhythms in captive bred Bullfrog (*Lithobates catesbeianus*)
1:45 pm	**104-2**	*Hunt KE, Buck CL, Hudson J, Fernández-Ajó A, Heide-Jørgensen MP, Ferguson SH, Matthews CJD; George Mason U, N Arizona U, U Manitoba, Greenland Inst Nat Res, Fish Oc Canada*	Patterns in Reproductive Seasonality Inferred From Annual Testosterone Cycles In Baleen Of Adult Male Bowhead Whales (*Balaena mysticetus*)
2:00 pm	**104-3**	*Cox RM, Wittman T, Robinson CD, Cox CL, John-Alder HB; University of Virginia, Georgia Southern University, Rutgers University*	Sex steroids as mediators of phenotypic integration, genetic correlations, and evolutionary transitions
2:15 pm	**104-4**	*Holloway ND, Mackenzie DS, Riley BB; Texas A&M University*	Evidence for expression of the sodium iodide symporter (NIS) in novel neural and ovarian locations in teleost fish
2:30 pm	**104-5**	*Müller UK, Summers AP; CSUF, UW - Friday Harbor Labs*	SICB Journals - synergy, status, and a call to action
2:45 pm	**104-6**	*Summers AP, Müller UK; UW -Friday Harbor Labs, CSUF*	Ideas and initiatives for the two SICB journals

3:00 pm **Coffee Break** **Grand Ballroom**

1:30 PM – 3:30 PM **Session 105** **Rooms 203-204**

The Evolution of Morphology

Chair: Margaret Hall

1:30 pm	**105-1**	*Hall MI, Plochocki JH, Sosa JRR, Voegele GM; Midwestern University, University of Central Florida, Dartmouth College*	The evolution of cutaneous muscles in placental mammals
1:45 pm	**105-2**	*Webb JF, Molnar EJ, Nickles KR, Jones AE, Conway KW, McHenry MJ; University of Rhode Island, Texas A&M, University of California Irvine*	How to Distinguish Pattern from Chaos: Superficial Neuromasts of the Mechanosensory Lateral Line System in Fishes
2:00 pm	**105-3**	*Simon MN, Brandt R, Kohlsdorf T, Marroig G; University of Sao Paulo*	Linking Phenotypic Modularity to Directional Selection on Multiple Functional Performances

2:15 pm	**105-4**	*Oufiero CE; Towson U*	Morphological evolution of the praying mantis (Mantodea) raptorial foreleg in relation to body size and depth perception
2:30 pm	**105-5**	*Roberts A, Wainwright P; University of California, Davis*	Anatomical basis of jaw protrusion directionality in ponyfishes (Leiognathidae)
2:45 pm	**105-6**	*Schwaha T; University of Vienna*	O anus where art thou? An investigation of ctenostome bryozoans
3:00 pm	**105-7**	*Feltmann A, Gifford M, Field E; University of Central Arkansas*	Effect of Selection and Genetic Drift on Phenotypic Diversification in the Eastern Collared Lizard
3:15 pm	**105-8**	*Goodman CM, Buckman KN, Hill JE, Tuckett QM, Romagosa CM; University of Florida*	Dispersal, performance, and Morphometry of a Novel Invader (*Xenopus tropicalis*) in Central Florida: Evidence of Spatial Sorting?

3:30 pm ..... **Coffee Break** ..... **Grand Ballroom**

1:30 PM – 3:30 PM **Session 106** **Rooms 402-403**

The Evolution of Physiology

Chair: Anthony Gilbert

1:30 pm	**106-1**	*Saenz DE, Winemiller KO, Markham MR; Texas A&M University, University of Oklahoma*	Derived Loss of Signal Plasticity in a Genus of Weakly Electric Fish
1:45 pm	**106-2**	*Gilbert AL, Rutschmann A, Fitschen-Brown MS, Miles DB, Clobert J; Ohio University, University of Auckland, Theoretical and Experimental Ecology Station*	Acclimation to warmer temperatures attenuates heat-shock plasticity in high elevation populations of common lizards
2:00 pm	**106-3**	*Faria S, Goodbody-Gringley G, Marangoni L, Pereira C, Bateman S, Zilberberg C, Mies M, Kitahara M, Bianchini A, Garland T, Navas C; Bermuda Institute of Ocean Sciences, Monaco Scientific Center, Federal University of Rio de Janeiro, University of São Paulo, University of California, Riverside*	Brazilian Phenotypic Plasticity under Climate Changes: an Evolutionary History Scripted in the Coral-Dinoflagellate Symbiosis
2:15 pm	**106-4**	*Boggs TE, Friedman JS, Gross JB; University of Cincinnati*	Parallel adaptation to hypoxia in the blind Mexican cavefish, *Astyanax mexicanus*.
2:30 pm	**106-5**	*Gamboa MP, Kohlruss PS, Wolf BO, Sillett TS, Funk WC, Ghalambor CK; Colorado State University, University of New Mexico, Smithsonian Conservation Biology Institute*	Climate variation facilitates morphological, not physiological, divergence in song sparrows
2:45 pm	**106-6**	*Marshall CA, Zeller KR, Ghalambor CK; Colorado State University*	The Effects of Long- and Short-Term Salinity Acclimation on the Aerobic Scope of Trinidadian Guppies: Implications for Dispersal
3:00 pm	**106-7**	*Zhang Y, Wong HS; University of Memphis, Buck Institute for Research on Aging*	Are mitochondria the major contributor of reactive oxygen species production? No.
3:15 pm	**106-8**	*Wolf CJ, Cheviron ZA; University of Montana*	Seasonal Variation of Body Composition in Deer Mice (*Peromyscus maniculatus*)

3:30 pm ..... **Coffee Break** ..... **Grand Ballroom**

Monday POSTER SESSION P3

Grand Ballroom, 3:30-5:30 PM

Poster Set Up: 7:00-8:00 am; Poster Teardown: 5:30-6:00 pm

Even # - Authors present from 3:30-4:30 pm; Odd # - Authors present from 4:30-5:30 pm

Pollution and toxicity

P3-1	*Ujhegyi N, Bókony V; Plant Protection Institute*	Skin Coloration as a Possible Non-Invasive Marker for Skewed Sex Ratios and Gonadal Abnormalities in Immature Common Toads
P3-2	*Abdulelah SA, Crile KG, Almouseli A, Awali S, Tutwiler AY, Tien EA, Manzo VJ, Hadeed MN, Belanger RM; University of Detroit Mercy*	DNA damage in the cells of lateral antennules of crayfish (*Faxonius virilis*) is increased following exposure to environmentally relevant concentrations of atrazine
P3-3	*Price ER, Mager EM; University of North Texas*	The Effects of Oil and PAH Exposure on Swim Bladder Development and Function
P3-4	*Jacob JR, Vo CP, Stahlschmidt ZR; U Pacific*	Glyphosate in a warming world: Effects on lifespan, feeding, and food conversion efficiency in a field cricket, *Gryllus lineaticeps*
P3-5	*Almouseli A, Manzo VJ, Yacoo KE, Dayfield DJ, Torres VC, Evans KR, Roberts-Kirchhoff ES, Belanger RM; University of Detroit Mercy*	The effects and quantitation of atrazine in crayfish tissue post-exposure
P3-6	*Lacy BD, Rahman MS, Rahman MS; University of Texas Rio Grande Valley*	Interactive Effects of Heat Stress and Pesticide Co-exposure on Osmoregulation and Antioxidant System in Gill and Kidney of Goldfish
P3-7	*Crile KG, Abdulelah SA, Almouseli A, Manzo VJ, Hadeed MN, Fard A, Iqbal T, Belanger RM; University of Detroit Mercy*	Ecologically relevant atrazine exposures affect the cells of the hepatopancreas of crayfish (*Faxonius virlis*)
P3-8	*Smith TR, Moore IT, Hernandez J; Virginia Tech*	Using buccal cells to estimate DNA damage associated with urbanization
P3-9	*Awkerman JA, Lavelle CM, Henderson WM, Hemmer BL, Lilavois CR, Harris P, Zielinski N, Hoglund MD, Glinski DA, MacMillan D, Ford J, Seim RF; US EPA RF*	Cross-taxa Distinctions in Developmental Effects of Trifluralin Exposure between Representative Toxicological Species for Aquatic Risk Assessment
P3-10	*Wilburn PA, Maness TJ; Louisiana Tech University*	Liver lead concentration is unrelated to presense of lead shot in waterfowl gizzards
P3-11	*Flood S, Depaola N, Moody T, Mass S, St. John P; SUNY New Paltz*	Quantification of BPA Retention in Planaria
P3-12	*Silva MA, Cho A, Ibarra JN, Naquin TE, Teeple JB, Whittemore KS, Hoese WJ, Burnaford JL, Carrillo A, Leigh S; California State University Fullerton, Cabrillo Marine Aquarium*	Bust A Move: Movement of Microplastics Through Open Water Marine Trophic Levels

Ecotoxicology

P3-13	*Dubois S, Rahman AF, Rahman MD*; University of Texas Rio Grande*	Investigating Environmental Contamination in the Lower Laguna Madre Through CYP1A Expression in Pinfish Liver
P3-14	*Ackerly KL, Esbaugh AJ; University of Texas at Austin*	Additive effects of oil exposure and hypoxia on aerobic performance in red drum, *Sciaenops ocellatus*
P3-15	*Goodchild CG, Durant SE; Oklahoma State University, University of Arkansas*	Avian eggs externally exposed to sublethal crude oil applications have reduced heart rate and metabolic rate.
P3-16	*Tellez-Gomez QM, Flores-Santin JR; Universidad Autonoma del Estado de Mexico*	Embryonic Developmental Effects of Maternal Ingestion of Cypermethrin in Japanese Quail *Coturnix japonica*
P3-17	*Llewellyn HJ, Hare-Harris A, Hranitz JM, Surmacz CA; Bloomsburg University*	Sublethal Doses of the Neonicotinoid Imidacloprid Alters mRNA Expression in Cellular Stress Pathways in Honey Bees
P3-18	*Fritz T, Brogren D, Burley A, Holihan M, Graham M, Chrysler J, Scott J; Saginaw Valley State University*	Dioxin-induced steatosis and liver toxicity is enhanced by a ketogenic diet

Molecular Evolution

P3-19	*Thueson KA, Rabinowitz SA, Havird JC; University of Texas at Austin*	Nuclear Compensation as the Dominant Form of Mitonuclear Coevolution
P3-20	*Briseno JL, Tassia MG, Waits DS, Halanych KM; University of California Santa Cruz, Auburn University*	TIR Domain-Containing Protein SARM1 Diversity in Deuterostomes and Lophotrochozoans
P3-21	*Yousefelahiyeh M, Miller DR, Kim H, Parker J; California Institute of Technology*	Dalotia coriaria as a genetic model system of animal symbiosis
P3-22	*Fitzgerald RP, Chandler C; SUNY College at Oswego*	Determining Sex Specific Loci in the Genome of the Terrestrial Isopod *Porcellio scaber*
P3-23	*Bogantes VE, Waits DS, Halanych KM; Auburn University*	Toxin diversity across the annelid tree of life
P3-24	*Saiz LV, Kelleher ES; University of Houston*	Does the *Drosophila melanogaster* gene *bruno* impact transposition?
P3-25	*Plakke MS, Blumenstiel JP, Walters JR; University of Kansas*	Patterns of small non-coding RNA expression across dimorphic sperm
P3-26	*Joglekar IU, Clark AC; University of Texas at Arlington*	Evolution of Conformational Landscape in Reef-Building Coral Caspases
P3-27	*McElroy KE, Boore J, Logsdon JM, Neiman M; Iowa State University, Providence St Joseph Health, Institute for Systems Biology, University of Iowa*	Effects of asexuality on repetitive element evolution in a freshwater snail

Hormones, Behavior, Development and Reproduction

P3-28	*Cheung JA, Rose CS; James Madison University*	The hormonal control of anuran ossification sequences
P3-29	*Heppner JJ, Ouyang JQ; University of Nevada, Reno*	Urbanization and parental investment in a free-living songbird
P3-30	*Closs LE, Baker DM, Fontaine R, Weltzien FA; University of Mary Washington, Norwegian University of Life Sciences*	Investigating Reproductive Success and Endocrine Regulation of Mating Strategies in Male Medaka
P3-32	*Cooper D, Kovacs J; Spelman College*	Evidence of Horizontal Gene Transfer in the Pea Aphid Acyrthosiphon pisum
P3-33	*Thomas P, Pang YF, Tan W; University of Texas at Austin*	Rapid Progestin Induction of Sperm Hypermotility in Marine Fish through Membrane Progestin Receptor Alpha
P3-34	*Clapp N, Reichert M; Oklahoma State University*	The Effect of Arginine Vasotocin on Competitive Behavior in *Hyla chrysoscelis*
P3-35	*Lusk EP, Witek TAR, Casto JM; Illinois State University*	Effects of *in ovo* treatment with etiocholanolone on nestling development
P3-36	*Ziauddin LS, Sarathy J, Hall IC*; Benedictine University*	Prolactin influences osmoregulation in adult African clawed frogs, *Xenopus laevis*.
P3-37	*Kratochvil LB, Small TW, Thompson RR; Bowdoin College, Oxford College of Emory University*	Rapid effects of androgens on olfaction in the zebrafish, *Danio rerio*
P3-38	*Eshleman MA, Klug PE, Wissel B, Greives TJ; NDSU, USDA-APHIS-WS, University of Regina*	Migration and Reproduction: Is There a Reproductive Advantage to a Shorter Migration?
P3-39	*Tait C, Ramirez MD, Olson M, Katz PS; Univ of Massachusetts Amherst*	Molecular and behavioral characterization of two reproductive hormones in the nudibranch *Berghia stephanieae*
P3-40	*Comito D, Bentley GE; University of California Berkeley*	Gonadotropin-Inhibitory Hormone and its Receptor in Zebra Finch Spinal Cord: A Novel Pathway for Neuropeptide Action?

Immunity: in defense of an organism

P3-41	*Cornelius Ruhs E, Martin LB, Downs CJ; University of South Florida, SUNY-ESF*	The impacts of body mass on immune cell concentrations in birds
P3-42	*Dallas JW, Deutsch M, Warne RW; Southern Illinois University*	Thermal Performance of an Exotic Gekkonid and the Effects of n-3 PUFAs on Immunity
P3-43	*Martin MN, Zimmerman LM; Millikin University*	*In vitro* synergistic activity of antibiotics and red-eared slider plasma on bacterial growth
P3-44	*Barsotti AMG, Madelaire CB*, Wagener C, Titon Jr. B, Gomes FR, Measey J; University of São Paulo, Northern Arizona University, Stellenbosch University*	Challenges of the invasion front: water balance, stress and immunity in the Guttural toad

Immune-based tradeoffs

P3-45	*Weier D, Ranchod P, Steffenson M; St Edward's University*	The Effect of Colony Relocation Stress on Honeybee Immunity
P3-46	*Smith JJ, Balenger SL; University of Mississippi*	Costs of Immunity vs. Costs of Infection: Is the Relationship Between Humoral Immunity and Corticosterone Context Dependent?
P3-47	*Kenny E, Howey CAF; University of Scranton*	Ambient Light at Night and Effects on the Immune Response of Anoles
P3-48	*Rowley AA, Adelman JS, Dalloul RA, Vinkler M, Henschen AE, Hawley DM; Virginia Tech, University of Memphis, Charles University*	Are There Broader Immunological Effects of Evolved Disease Tolerance in House Finches?
P3-49	*Baeza K, Ranchod P, Steffenson M; St Edward's University*	The Introduction of Commonly Used Pesticides and Their Effect on the Immunological Function of Honeybees
P3-50	*Virgin EE, Kepas ME, Hudson SB, French SS; Utah State University*	Comparisons of egg yolk physiology and hatchling quality between urban and rural Side-blotched lizards (*Uta stansburiana*)

Reproductive Biology

P3-51	*Davis AC, Ryan MJ; University of Texas Austin*	Mirror mirror on the wall: Using mirror image scrutiny to probe phenotypic variation in an asexual-sexual fish system
P3-52	*Angelis E, Greenway G, Miller CW; University of Florida*	How does weapon loss influence mating behavior in the coreid *Narnia femorata*?
P3-53	*Lane ZM, Darnell MZ; University of Southern Mississippi*	A Home Worth Fighting For: Burrows as a Thermoregulatory Resource in the Fiddler Crab *Uca pugilator*
P3-54	*Dennis AJ, Taylor LA, Pertuit OR, Carson IR, Sanger TJ, Johnson MA; Trinity University, Loyola University*	Oviposition site choice in the brown anole lizard, *Anolis sagrei*
P3-55	*Brewer VN, Lane SJ, Sewall KB, Mabry KE; New Mexico State University, Virginia Polytechnic Institute and State University*	Effects of Urbanization on Extra-pair Paternity in the Song Sparrow
P3-56	*Hain TJA, Churchman EKL, Knapp R, Neff BD; University of Western Ontario, University of Oklahoma*	Nest size and 11-ketotestosterone in bluegill sunfish (*Lepomis macrochirus*)
P3-57	*Collum A, Whitman S, Hodges A; State University of New York*	Does Mating with a Novel Male Affect Female Fecundity in Bean Beetles?
P3-58	*Xavier C, Bergey L, Ritchie L, Jean-Paul J; Centenary University*	Differences in reproductive efforts in the invasive grass shrimp, Palaemon macrodactylus over gravid native Palaemon shrimp.
P3-59	*Strom MK, Mabry KE; New Mexico State University*	The Influence of Habitat Type on the Reproductive Success of Brush Mice (*Peromyscus boylii*)
P3-60	*L'Ecuyer Z, Sharp S, Todd K; Westminster College*	Hormonal circuits responsible for reproductive behavior
P3-61	*Solis GM, Husak JF; University of St Thomas*	The Role of Aromatization in Male Brown Anole Sexual Behavior
P3-62	*Afkhami M, Masly JP; University of Oklahoma*	The genetics of co-evolved reproductive traits in *Drosophila*
P3-63	*Keck CMT, Earley RL, Gresham JD; University of Alabama*	How Do Males Reproduce When Prospective Partners Prefer to Mate with Themselves?
P3-64	*Choudhry A, Lo B, Freeman A, Ophir A; Thomas Jefferson High School for Science and Technology, Cornell University*	Female African giant pouched rats scent mark at similar rates despite reproductive differences
P3-65	*Tweeten KA, Scollick JA; St Catherine University*	Tracking of Labeled Sperm Suggests that Diploid Populations of Sexually Reproducing *Lumbriculus* Cross Fertilize

Predator-Prey Interactions

P3-66	*Stewart KA, Mutsuddy A, Seroy SK; Heritage University, Wheaton College, University of Washington*	Effects of Warming Ocean Temperatures on Predation Rates on the Marine Snail *Lacuna vincta*
P3-67	*Folfas E, Cox C, McMillan WO, Logan ML; Univ of Toronto, Georgia Southern Univ, Smithsonian, Univ of Nevada*	Changes in escape behavior in a terrestrial vertebrate after experimental transplantation to a novel environment
P3-68	*Schneider NG, McKamy AJ, Diamond KM, Blob RW; Clemson Univ*	Do predators take advantage of prey blind spots? In-stream analysis of predator-prey interactions in Hawaiian stream fishes.
P3-69	*Chamberlain JD; Southern Arkansas University*	The Role of a Thiamine-degrading Enzyme in Shaping Trophic Ecology of Watersnakes

P3-70	*Fabian ST, Lin HT; Imperial College London*	Dissecting the Implementation of Dragonfly Guidance Behaviours
P3-71	*Gutierrez-Andrade D, Middlebrooks ML; University of Tampa*	Effectiveness of ceratal autotomy as a defense mechanism for the sacoglossan sea slug *Placida kingstoni*
P3-72	*Luebbert KM, Martin AL; Saginaw Valley State University*	How Predators and Conspecifics Influence Crayfish Shelter Preference?
P3-73	*Chandler KL, Davis J, Wolford D; Radford University*	Arthropod Thunderdome: Antipredator responses of *Gromphadorhina portentosa* in relation to predator species and relative size differential
P3-74	*Baker NJ, Garcia L; Austin College*	Transgenerational Effects of Predatory Stress in Pea Aphids
P3-75	*Jean-Paul J, Bergey L, Ritchie L, Xavier C; Centenary University*	Effects of Light Conditions and Morphological Size on Predation of the Invasive Grass Shrimp, Palaemon Macrodactylus, and a Native Species, Palaemonetes Pugio.
P3-76	*Howerin HM, Foltz SL; Radford University*	The Perfect Home: What Nestbox Features and Environmental Conditions Do Eastern Bluebirds and Tree Swallows Prefer?
P3-77	*Jara RF, Crego RD, Samuel MD, Rozzi R, Jiménez JE; University of North Texas, University of Wisconsin-Madison*	Nest-Site Selection and Breeding Success of Passerines in the Southernmost Forest of the World

Complementary to S7: Building Bridges from Genome to Phenome: Molecules, Methods and Models

P3-78	*Ferreira LF, Garcia Neto PG, Titon SCM, Titon Jr. B, Gomes FR, Assis VR*; Santo Andre Foundation University Center, University of Sao Paulo*	Exploring toads immune response with molecular techniques
P3-79	*Durica DS, Wolfard F, Shyamal S, Das S, Mykles DL; University of Oklahoma, Colorado State University*	Examination of Ecdysteroid Hormone Biosynthetic Enzyme Genes in the Y-Organ Transcriptome and Developing Limb Bud Transcriptome During the Crab Molt Cycle
P3-80	*Bentley VL, Mykles DL; Colorado State University*	Investigating the function of Krüppel homolog 1 (Kr-h1) on molt regulation in *Gecarcinus lateralis*
P3-81	*Rocereto SK, Whittall JB, Wheat CW, Rank NE, Dahlhoff EP; Santa Clara Univ, Univ Stockholm, Sonoma State Univ*	Non-synonymous variation at a metabolic enzyme locus (*Pgi*) under purifying selection
P3-82	*Valle PF, Rocereto SK, Rank NE, Dahlhoff EP; Santa Clara Univ, Sonoma State Univ*	Star-crossed lovers: Mitonuclear interactions may affect reproductive activity and offspring performance in a montane leaf beetle

Comparative Genomics and Proteomics

P3-83	*Barreira SN, Baxevanis AD; NIH*	Exploring the Role of Ribosomal Biogenesis in the Context of Regeneration
P3-84	*Chang ES, Travert M, Sanders SM, Klompen AML, Gonzalez P, Barreira S, Mullikin J, Cartwright P, Baxevanis AD; NHGRI/NIH, U Kansas, U Pittsburgh*	The genome of the hydrozoan *Podocoryna carnea*: An emerging resource for comparative biology
P3-85	*Gonzalez P, Seaver EC, Baxevanis AD; NHGRI/NIH, University of Florida*	Haplotype-Phased *de novo* Genome Assembly of the Marine Annelid *Capitella teleta* Using a Three-Generation Long-Read Binning Approach
P3-86	*Preising GA, Faber-Hammond JJ, Renn SCP; Reed College*	aCGH Detects Copy Number Variation with Similar Resolution to PacBio Sequencing Approaches
P3-87	*Anderson AP, Renn SCP; Reed College*	A genus of gouramis, *Sphaerichthys*, as a novel system for investigating evolution of transitions of sex-roles in brood care and sexual selection.
P3-88	*Firneno TJ, Emery AH, Roelke CE, Fujita MK; University of Texas at Arlington*	Investigating Toxin Evolution in the Bufonid Parotoid Gland
P3-89	*Krantz J, Daly M, Macrander J; Florida Southern College, Ohio State University*	Identifying Convergence of ShK Toxins in Sea Anemones
P3-90	*Ortiz J, Debiasse MB, Ryan JF; University of Florida, Iowa State University*	Evolutionary history of an ancient innexin gene cluster in ctenophores
P3-91	*McKinley CN, Lower SE; Bucknell University*	Using transcriptomics to identify candidate genes involved in predatory behavior of femme fatale fireflies

P3-92	*Zhang P, Xu S, Heath-Heckman E, Jacobs D; University of California Los Angeles*	Historical DNA Methylation Using Computational Methods
P3-93	*Waits DS, Ribeiro R, Kocot KM, Bullard SA, Halanych KM; Auburn University, University of Alabama*	You Aren't What You Eat: The Impact of Sequence Contamination on Phylogenomics of Blood Flukes (Platyhelminthes; Schistosomatoidea)
P3-94	*Paulat NS, Manthey JD, Platt II RN, Ray DA; Texas Tech University, Texas Biomedical Research Institute*	Transposon Activity and Mutational Impacts in *Myotis*
P3-96	*Doerr H, Palmisciano M, Flannery C, Hamilton S, Logan C; California State University, Moss Landing Marine Labs, Humboldt State University*	Effects of fluctuating vs. static exposure to hypoxia and high pCO_2 on gill transcriptomes in three rockfish species

Integrative Biology of Reproduction

P3-97	*Morningstar S, Maslikova V*, Reams B, Short C, Mashanov V, Jahan-Mihan A, Hahn DA, Hatle JD; Univ of North Florida*	Dietary and storage protein thresholds for reproduction in grasshoppers
P3-98	*Mark D, Nasari A, Triano N, Bauer C; Adelphi University, Hicksville High School*	Early identification of pregnancy in a precocial rodent (*Octodon degus*)
P3-99	*Bentz EJ, Mason RT; Oregon State University*	Characterizing the Function of the Harderian Gland and its Interactions with the Vomeronasal Organ in the Red-sided Garter Snake
P3-100	*Ochs RA, Chamberlain JD; Southern Arkansas University*	The Reproductive Effects of Supplemental Nutrition in an Income-breeding Snake
P3-101	*Bleke CA, French SS, Roberts SB, Gese EM; Utah State University, Idaho Department of Fish and Game, USDA-National Wildlife Research Center*	Natural variations in fecal steroid hormones across pregnancy and population
P3-102	*Weber WD, Fisher HS; University of Maryland*	Mating system drives the evolution of male and female reproductive traits in *Peromyscus mice*
P3-103	*Rennolds CW, Bely AE; University of Maryland*	Reproductive investment is enhanced by food but independent of injury history in an asexual annelid
P3-104	*Stephens ER, Harris BN, Prater CM, Soto PL, Carr JA; Texas Tech University, Louisiana State University*	Testicular histopathology in an Alzheimer's disease model
P3-105	*Baloun DE, Lane JE, McAdam AG, Dantzer BJ, Boutin S; University of Saskatchewan, University of Guelph, University of Michigan Ann Arbor, University of Alberta Edmonton*	Does the ability to dissipate endogenous heat to their environment constrain reproductive investment for wild endotherms?

Muscle and cardiovascular physiology

P3-106	*Merges CR, Craig K, Pirtle T; College of Idaho*	Exposure to cAMP and cGMP Inhibits Heart Rate in *Daphnia Magna*
P3-107	*Gardner S, Appel A, Mendonça MT; Auburn University*	Chasing cane toads: locomotive and behavioral changes from northward dispersal
P3-108	*Weiss A, Lau B, Spaniac M, Monroy JA; Claremont Colleges*	The Effects of Eccentric Resistance Training on History-Dependent and Elastic Properties of Skeletal Muscles from Mice
P3-109	*Farmer L, Krajniak K; Southern Illinois University Edwardsville*	The effects of FMRFamide and APKQYVRFamide on the same isolated crop-gizzards of earthworm, *Lumbricus terrestris*
P3-110	*Larson AM, Kanatous SB; Colorado State University*	Temporal Examination of Myoglobin and Myosin Heavy Chain Expression Patterns in Skeletal Muscle Cells
P3-111	*Goodreau JL, Krans JL; Western New England University*	Using STED to measure RNAi induced changes in isoform structure of the titin ortholog, sallimus.
P3-112	*Hefele KR, Jorgensen DD; Roanoke College*	Ventricular function in American lobsters and Atlantic blue crabs: does contractility change with increasing metabolic demand?
P3-113	*Fletcher ML, Barrett LM, Dearolf JL, Thometz NM, Bryan A, Reichmuth C; Hendrix College, Univ of San Francisco, Alaska Department of Fish and Game, Univ of California Santa Cruz*	Fiber-type profile of bearded seal (*Erignathus barbatus*) longissimus dorsi muscle
P3-114	*Flores JP, Gad M, Bushong E, Schulz JR; Occidental College*	From Sequence to Activity: Synthetic Neuroexcitatory Peptides from Fish-Hunting Cone Snails

P3-115 *Nazar S, Dearolf JL, Thometz NM, Bryan A, Reichmuth C; Hendrix College, Univ of San Francisco, Alaska Department of Fish and Game, Univ of California Santa Cruz*
Fiber-type profile of the locomotor muscle of spotted seals

P3-116 *Mukhtar V, Dearolf JL, Thometz NM, Bryan A, Reichmuth C; Hendrix College, Univ of San Francisco, Alaska Department of Fish and Game, Univ of California Santa Cruz*
Fiber-type profile of the *latissimus dorsi* muscle of the ringed seal

P3-117 *Kinsey ST, Cook JG, Laite C, Secor SM; University of North Carolina Wilmington, University of Alabama*
Muscle growth patterns and implications for energy costs in diamondback water snakes (*Nerodia rhombifer*)

P3-118 *Craig KJ, Merges C, Pirtle TJ; College of Idaho*
Exposing *Daphnia magna* to Ethanol Results in a Decline in Heart Rate by Increasing Nitric Oxide Production

P3-119 *Porras ND, Culverhouse EK, Tate KB; Texas Lutheran University*
The Metabolic and Cardiovascular Response of Central Texas Pulmonate Snails to Acute and Chronic Warming Events

Locomotion - Swimming

P3-120 *Fish FE, Segre PS, Potvin J, Goldbogen JA; West Chester University, Stanford University, St Louis University*
The Upper Jaw of Rorquals Can Act as a Delta Wing for Stability during Lunge Feeding

P3-121 *Kirwan DJ, Ruddy BT, Porter ME; Florida Atlantic University*
Predator-Prey Swimming Kinematics of *Sphyrna mokarran* and *Carcharhinus limbatus*

P3-122 *Smith HJ, Gough WT*, Savoca MS, Czapanskiy MF, Fish FE, Potvin J, Cade DE, Bierlich KC, Kennedy J, Goldbogen JA; Southwestern University, Stanford University, West Chester University, Saint Louis University, University of California Santa Cruz, Duke University*
The Physics of Whale Movement: Drag and Thrust Production to Measure Whale Propulsive Efficiency

P3-123 *De La Cruz D, Pergola D, Svensson K, Gellman E, Ellerby DJ*; Wellesley College*
Scaling of preferred swimming kinematics in bluegill sunfish (*Lepomis macrochirus*)

P3-124 *Akanyeti O, Strong JB; Aberystwyth University*
Achieving cohesive and mobile groups using simple sensory feedback

P3-125 *Coughlin DJ, Chrostek JD, Ellerby DJ; Widener University, Wellesley College*
Intermittent Propulsion in Largemouth Bass

P3-126 *Chamanlal A, Sayegh N, Martinez D, Maia A; Rhode Island College*
Function of the Erector Muscles of the Spiny Dorsal Fin in Bluegill exposed to Turbulence

P3-127 *Blackshare TW, Ford MP, Garayev K, Murphy DW, Santhanakrishnan A; Oklahoma State University, University of South Florida*
Metachronal, synchronous, and hybrid stroke patterns in aquatic paddling locomotion

P3-128 *Rosado KA, Kruppert S, Summers AP; Monmouth University, University of Washington*
Armor and Maneuverability of Poachers

P3-129 *Logsdon M; University of Washington*
LiEFi (Light-Energy Fish): Using Simple Bio-Mechanical Models to Simulate Climatic Changes in Fish Communities

P3-130 *Formoso KK, Habib MB, Bottjer DJ; University of Southern California*
Assessing the Mosasaur Pectoral Girdle and its Controls on Chest Width: Implications for Mosasaur Swimming Function

Locomotion - Tricky substrates

P3-131 *Mann SD, Reed SA, Bergmann PJ; Clark University*
Running on Land and Water: Three-dimensional Limb Kinematics and Locomotor Performance of Anolis sagrei

P3-132 *Ashley-Ross MA, Bressman NR; Wake Forest University*
A twisted tail of intrigue: Does fish vertebral morphology constrain locomotor mode?

P3-133 *Kinsey CT, Blob RW; Clemson University*
Predatory selection across stages of limb and tail development in *Xenopus* tadpoles

P3-134 *Reed SE, Mann SDW, Bergmann PJ; Clark University*
Mechanisms That Determine Success At Running On Water In The Quadrupedal Lizard *Anolis sagrei*

P3-135 *Huang S, Tang Y, Tao J; Arizona State University*
SBOR: A Self-Burrowing-Out Robot Inspired by Razor Clam

P3-136 *Treers LK, Stuart H; University of California Berkeley*
The Effect of Shell Shape on Burrowing Dynamics in Granular Media

P3-137 *Redmann E, Ward AB; Adelphi University*
The Effect of Substrate on Terrestrial Locomotion in *Lepidosiren paradoxa*, the South American Lungfish, Informs the Water-to-Land Transition

P3-138 *Yohannan K, Narici V, Mass S; SUNY New Paltz* Further studies of axolotl and tiger salamander kinematics

P3-139 *Gamel KM, Astley HC; University of Akron* Design and Fabrication of an Underwater Force plate

Biomaterials - Fluids

P3-140 *Reid HE, Zhou H, Deng J, Jankauski M; Montana State University, Binghamton University* Towards the Design of Dynamically Similar Isospectral Isomodal Artificial Insect Wings

P3-141 *Hagood ME, Porter ME; Florida Atlantic University* Anisotropic Mechanical Properties of Shark Skin

P3-142 *West J, Farina S, Gibb A; Howard University, Northern Arizona University* Preference and Performance in Flatfish Burial

P3-143 *Wong JCM, Joshi V, Jaiman RK, Altshuler DL; University of British Columbia* Wing Morphing During Avian Flight Induces Changes in Local Wing Stiffness Which Affect Aeroelastic Response

P3-144 *McCarter MG, Loudon C; University of California Irvine* Mechanical damping of cricket antennae

P3-146 *Prakash VN, Bull MS, Prakash M; Stanford University* Tissue fracture dynamics govern plastic shape changes in a simple animal

P3-147 *Zeng Y, Nieders K, Petrichko S, Fudge D; Chapman University* Epidermal Threads in Pacific Hagfish (*Eptatretus stoutii*)

P3-148 *Elcock JN, Summers AP, Hall KC; Howard University, University of Washington* Skating on Egg Shells: Microstructure of Skate Egg Cases and Attachment to Substrate

P3-149 *Mvetimbo-Tambo KLO, Taft BN, Taft NK; University of Wisconsin Parkside, Landmark Acoustics LLC* Comparative Fin Ray Stiffness in Coho Salmon

P3-150 *Eng CM, Yawar A, Venkadesan M; Yale University* Functional Curvature and the Stiffness of Rayed Fins

P3-151 *Mohammadi S, Waldrop LD, Hassanalian M; Chapman University, New Mexico Tech* Investigation on aquatic animal colors and skin temperature on skin friction drag reduction

Ventilation and sensing

P3-152 *Amacker KY, Farina SC; Howard Univeristy* Asymmetrical Breathing in Flatfishes

P3-153 *Clark AE, Meredith TL, Porter ME; Florida Atlantic University* Comparing Olfactory Rosette Morphology Among Elasmobranchs

P3-154 *Handy SD, Farina SC; California State University San Bernardino, Howard University* Gill Position Affects Ventilatory Pressure Amplitudes in Pacific Spiny Dogfish

P3-155 *Jones AE, Webb JF; University of Rhode Island* Implications of the Relatively Long Larval Phase of a Salmonid (Brook Trout, *Salvelinus fontinalis*) for Mechanosensory Lateral Line System Morphology

P3-156 *Carter D, Lee-Robinson B, Williams T, Farina S; Howard University* Evolutionary Morphological and Behavioral Specializations for Jet Propulsion in Frogfishes

P3-157 *Hardy DJ, Salcedo MK, Kenny MC, Pulliam JN, Pendar H, Socha JJ; Morehouse College, Virginia Tech, Wake Forest University* Shot through the heart: a non-invasive IR technique to measure dorsal heart pumping in insects

P3-158 *Gabriel AN, Brainerd EL, Olsen A, Hernandez LP, Camp A, Farina SC; Howard University, Brown University, George Washington University, University of Liverpool* Influence of mechanical linkages between the buccal and gill chambers on ventilatory kinematics

P3-159 *Young BA, Adams J, Knoche L, Cramberg M, Klassen M; Kirksville College of Osteopathic Medicine* Regulation of Narial Patency in *Alligator mississippiensis*

Locomotion - Gliding and Flying

P3-160 *Ribak G, Urca T, Debnath AK, Stefanini J, Gurka R; Tel Aviv University, Coastal Carolina University, TSI France* The Aerodynamics and Energetics of a Long-Distance Flying Beetle Studied Using PIV

P3-161 *Swinsky CM, Jackson BE; Longwood University* (Don't) Shake a Tail Feather: Function of American Goldfinch Tails During Slow Flight

P3-162 *Sathe EA, Dudley R; University of California Berkeley* Forelimb Kinematic Variation Alters Body Velocity in Flat-tailed House Geckos (*Hemidactylus platyurus*) During Directed Aerial Descent

P3-163 *Senthivasan S, Altshuler DL; University of British Columbia* Automated kinematic tracking using inertial sensor arrays

P3-164 *Fan X, Swartz SM, Breuer KS; Brown University* A reduced order computational model to simulate the dynamics of maneuvering flight

P3-165 *Byrnes G, Lim NTL; Siena College, National Institute of Education, Nanyang Technological University* — Membrane shape changes during gliding in flying squirrels

P3-166 *Bortoni A, Morris AT*, Young IR, Breuer KS, Swartz SM; Brown University* — How Bats Don't Crash and Burn: Bilateral Muscle Recruitment for Recovery Maneuvers in Egyptian Fruit Bats

P3-167 *Von Hagel AA, Malingen SA, Daniel TL; University of Washington* — Predicting muscle length changes from EMG activation in *Manduca sexta*

P3-168 *Worrell TA, Weiss TM, Gonzalez MG, Whitehead JG, Salcedo MK, Pulliam JN, Graham M, Socha JJ; Virginia Tech* — Development of a multi-camera array to study gliding in flying snakes

Biological Rhythms

P3-169 *McCahon SL, Shankar A, Williams C; University of Alaska Fairbanks* — Effects of short photoperiod on sleep and carbohydrate consumption in diurnal grass rats

P3-170 *Callegari K, Shankar A, Seitz T, Drown D, Williams C; University of Alaska Fairbanks* — Effects of Short Photoperiod and Carbohydrate Consumption on the Gut Microbiome of Diurnal Grass Rats

P3-171 *Taylor LA, Pertuit OR, Carson IR, Tang C, Dennis AJ, Thawley CJ, Johnson MA; Trinity University, United International College, Davidson College* — Artificial Light At Night (ALAN): An Anthropogenic Challenge for Urban Lizard Behavior and Physiology

P3-172 *Berger CA, Tarrant AM; Woods Hole Oceanographic Institution* — Can the cnidarian circadian clock entrain to temperature cycles?

P3-173 *Longmire AE, Clark AE, Earley RL, Gresham JD; University of Alabama* — Self-Compatibility in a Self-Fertilizing Fish

Social Behaviours

P3-174 *Sieber KR, Zlotnik S, Miller CW; University of Florida* — Feeding Facilitation and its Impacts on Mouthpart Development in the Leaf-Footed Bug, *Narnia femorata*

P3-175 *Hurd PL, Dittmann N, Kruschke Z, Vandenberg P; University of Alberta* — Behavioural differences between unstudied male and female morphs in the kribensis cichlid

P3-176 *Molina R, Kolonin A, Aspbury AS, Gabor CR; Texas State University* — Western Mosquitofish Social Behavior Varies with Levels of Land Use Conversion

P3-177 *Guo Y, Shampay J, Renn SCP; Reed College* — Effects of Social Stress on Telomere Length and Telomerase Activity in *Astatotilapia burtoni*

P3-178 *Curtis NJ, Mackiewicz AG, Putland RL, Mensinger AF; University of Minnesota Duluth* — Seasonal changes in male Oyster Toadfish's response to boatwhistle playbacks

P3-179 *Wang JY, Paggeot LX, Friesen CN, Solomon-Lane TK, Hofmann HA, Young RL; University of Texas at Austin* — Neural Transcriptomic Responses to Social Opportunity

P3-180 *Wallace KJ, Hofmann HA; University of Texas at Austin* — Neuroendocrine basis of cognition and behavior in a highly social cichlid fish

P3-181 *Price S, Schumer M, Wang S, Cummings M; University of Texas at Austin, Stanford University, University of British Columbia* — Transcriptomic signatures of "choosy" vs "indecisive" social preferences in a sailfin molly (*Poecilia latipinna*)

P3-182 *Weber AM, George EM, Rosvall KA; Indiana University, Bloomington* — Individual changes in conspecific aggression across breeding stages: an exploration into adaptive plasticity

P3-183 *Zona JO, Macomber GE, Martin AL, Moore PA; Saginaw Valley State University, Bowling Green State University* — Effects of Population Structure on Crayfish Behavior

P3-184 *Langager MM, Hawley DM; Virginia Tech* — Effects of *Mycoplasma gallisepticum* infection on juvenile sociality in house finches (*Haemorhous mexicanus*)

P3-186 *Aguiñaga J, Gomulkiewicz R, Watts HE; Washington State University* — Modeling private versus social information in the assessment of environments

P3-187 *Rodriguez SD, De Jesus-Soto MG, Fletcher SJ, Pretends Eagle TJ, Pentanidou T, Tscheulin T, Barthell J, Giray T, Abramson CI; St Philip's College, University Puerto Rico, Oklahoma State University, North Dakota State University, University of the Aegean, University Central Oklahoma, Oklahoma State University* — Observation learning of the cap pushing response in honey bees (*Apis mellifera*)

P3-188 *Ryan LM, Gunderson A; Tulane University* — Testing for differences in temperature-dependent activity between introduced Anolis sagrei and native Anolis carolinensis in the U.S.

P3-190 *Vargas C, Graham ZA, Palaoro AV, Angilletta MJ; Arizona State University, Universidade Federal de São Paulo* — Sex Differences in Offensive and Defensive Investment in Crayfish Claws

P3-191	*Greene MJ, Renner K, Swallow JG; University of Colorado Denver, University of South Dakota*	Mechanisms of Pavement Ant Aggression.
P3-192	*Johnson ZV, Long L, Li J, Aljapur V, Arrojwala M, Hegarty BE, Lee T, Gu K, Lecesne RL, Moorman JM, Streelman JT, McGrath PT; Georgia Institute of Technology PT*	Depth sensing and deep learning: new insights into social bower building behaviors in Lake Malawi cichlids
P3-193	*Bilbrey CM, Olenski M, Dirienzo N, Dornhaus A; University of Arizona Tucson*	Serotonin Reduces Aggression in Black Widow Spiders
P3-194	*Hastings BT, Jackson BE; Longwood University*	Analyzing the Flight Patterns and Behavior of Dragonflies Engaged in Aerial Territory Battles
P3-195	*Young RL, Weitekamp CA, Triki Z, Bshary R, Hofmann HA; University of Texas at Austin, University of Neuchatel*	Comparative Transcriptomics of Cooperative Behavior in Cleaner Wrasses
P3-196	*Ismail A, Goldina A; Elizabethtown College*	Assessing the effect of antidepressant sertraline on agonistic behavior of the subordinate crayfish *Orconectes rusticus*
P3-197	*Ellison M, Bush J; University of Tennessee Knoxville*	Hierarchical shifts in green anole social networks following brown anole invasion
P3-198	*White KJ, Starkey JM, Sah S, Pradhan DS; Idaho State University*	Different Aggressive Intensities Within Two Social Contexts in a Hermaphroditic Fish

Development in an ecological context

P3-200	*Shrestha S, Tung J, Grinshpon RD, Swartz P, Hamilton PT, Mydlarz L, Clark AC; University of Texas at Arlington, North Carolina State University*	Caspases from Scleractinian Coral Show Unique Regulatory Features
P3-201	*Marshall AS, Mullins H, Urista CY, Davis JE; Radford University*	Neutrophil/Lymphocyte Ratio as a Measure of Immune Response in Humans Exposed to Novel Microbiomes
P3-202	*Bae J, Bertucci EM, Moore JA, Bock SL, Rainwater TR, Hale MD, Parrott BB; Augusta Univ, Univ of Georgia, Benedict College, Tom Yawkey Wildlife Center, Univ of Virginia*	"The effects of the developmental environment on telomere length in *Alligator mississippiensis* hatchlings"
P3-203	*Salazar-Nicholls MJ, Macias H*, Warkentin KM; Boston University, Smithsonian Tropical Research Institute, Pontifical Catholic University*	Ontogeny and extent of hatching enzyme accumulation in red-eyed treefrog embryos
P3-204	*Mutsuddy A, Stewart K, Seroy SK; Wheaton College, Heritage University, University of Washington*	Effects of temperature and habitat on egg hatching time in the marine snail *Lacuna vincta*
P3-205	*Lau E, Oakley TH; University of California Santa Barbara*	A light meal: dietary acquisition and metabolism of bioluminescent compounds in the midshipman fishes
P3-206	*Lewis JA, Secor SM; University of Alabama*	Postprandial Remodeling of Organs and Intestinal Tissues by the Boa Constrictor
P3-207	*Camilliere M, McPherson DR; SUNY Geneseo*	Bimodal Effects of Serotonin on Cardiac Development in Japanese Quail Embryos
P3-208	*Finkler MS, Rhoda MA; Indiana University Kokomo*	Separating the effects of temperature on embryonic growth and development in *Chelydra serpentina*.
P3-209	*Pyatt JE, Li CY, Waits A, Earley RL; University of Alabama*	Mechanisms underlying temperature-dependent sex change
P3-210	*Reynolds JA; Ohio State University*	Coordinated microRNA and Endocrine Regulation of Insect Diapause
P3-211	*Hawkins TM, Short RA, Davis JE; Radford University*	Exploring the Impacts of Royal Jelly, Juvenile Hormone, and Nutritional State on Immune Response of *Gromphadorhina portentosa*
P3-212	*Zeller KR, Marshall CA, Ghalambor CK; Colorado State University*	The effects of local adaptation and rearing salinity on sustained swimming performance in freshwater estuary dwelling Trinidadian guppies
P3-213	*Martinez J, Koplyay C, Misamore M*; Texas Christian University*	Environmental factors effecting the survival and reproductive success of the invasive zebra mussel *Dreissena polymorpha*
P3-214	*Rashid S, Halanych K, Moss A; Auburn University*	Differential Gene Expression of Wound Repair in Mnemiopsis leidyi
P3-215	*Hagen OL, Cerveny KL; Reed College*	How does cell proliferation in the optic tectum change when fish see?

Character Development and Evolution

P3-216 *Rajaratnam G, Supeinthiran A, Su KFY, Meier R; National University of Singapore, University of Toronto Scarborough, Lee Kong Chian Natural History Museum*
Sex brushes and dirty flies: The development and evolution of a novel abdominal appendage in male sepsid flies

P3-217 *Zaloga AR, Neal S, Koenig KM; Harvard Univerisity*
Axon Guidance Cues in the Visual System of the Cephalopod *Doryteuthis pealeii*

P3-218 *Goodheart JA, Minsky G, Brynjegard-Bialik MN, Drummond MS, Munoz JD, Fallon TR, Schultz DT, Weng J, Torres E, Oakley TH; UC Santa Barbara, California State Univ Los Angeles, Massachusetts Institute of Technology, Monterey Bay Aquarium Research Institute*
Laboratory culture of the California Sea Firefly *Vargula tsujii*: Developing a model system for the evolution of marine bioluminescence

P3-219 *Kudla AM, Nijhout HF; Duke University*
Sources of Treehopper Pronotal Variability: An Exploration of Evolutionary Potential in *Entylia carinata*

P3-220 *Hammond TA, Kovacs J, Werren J; Spelman College, University of Rochester*
Evidence of Horizontal Gene Transfer in the Kissing Bug, *Rhodnius prolixus*

Undergraduate education

P3-221 *McCue MD, Arbutina L, Lighton JRB; Sable Systems International*
A new model for introducing undergraduate biology students to energy budgets

P3-222 *Whitenack LB; Allegheny College*
Insights from a five-year partnership between Allegheny College and local STEM teachers

P3-223 *Price SA, Larouche O, Friedman ST, Corn KA, Wainwright PC, Martinez CM; Clemson University, University of California Davis*
A practical guide to implementing a quantitative specimen-based classroom undergraduate research experience

P3-224 *Kane EA; Georgia Southern University*
On designing and implementing a new course as a new professor

P3-225 *Garner AM, Ramer AL, Niewiarowski PH; University of Akron*
A Sticky Situation: Anole Adhesive Performance as an Inquiry-based Learning Exercise in an Introductory Biology Course

P3-226 *Silverthorn DU; University of Texas at Austin*
Teaching Epithelial Transport as a Core Concept in Physiology

P3-227 *Chang ML, Abalusi D, McFarlane DA, Schmitz L;, Claremont McKenna, Scripps, and Pitzer Colleges*
Exploring the Tempo of Eye Evolution through a Web Interface Application

P3-228 *McAlister JS, Prestwich KN; College of the Holy Cross*
A liberal arts approach to introductory biology: Introductory sequence that gives full time to modern organismal biology

P3-229 *Calle E, Schenker E, Duprez D, Myers M, Lee V, Gilchrist SL; New College of Florida*
Adding STREAM to a Study Abroad Program in Honduras

P3-230 *Hoese WJ, Burnaford JL; Cal State Univ Fullerton*
Southern California Ecosystems Research Program: A Year-round Program Fostering Undergraduate Ecology Research

P3-231 *Krumm JL, Shea EK, Woods JL; Widener University, Delaware Museum of Natural History*
Integrating Digitized Natural History Collections into Course-based Undergraduate Research Experiences

P3-232 *Hebert AK, Mineo PM, Bennett KF, Ksiazek-Mikenas K, Marsh TM, Mellgren EM, Raimondi SL; Elmhurst College*
Incorporating Vision and Change at Elmhurst College: a Departmental Approach

P3-233 *Arrez SA, Arango K, Ferrigno A, Gidmark NJ; Knox College*
Impacts of a fin whale skeleton in teaching Art and Biology courses at an undergraduate-only college

Rising temperatures and climate change

P3-234 *Johnstone JB, Rahman MS; University of Texas Rio Grande Valley*
Impacts of rising temperature on gonadal functions, heat shock protein expression, cellular apoptosis, and body fluid conditions in Atlantic sea urchin

P3-235 *Shllki NJ, Powers DR; George Fox University*
Do Hummingbirds Select Perch Microclimates to Maximize Their Ability to Dissipate Heat?

P3-236 *Manzi S, Macrander J, Frias A, Krantz J; Florida Southern College*
A Comparative Analysis of Differentially Expressed genes from a stress response to increased water temperatures between sea anemones *Exaiptasia pallida*, *Diadumene lineata*

P3-237 *Ayala AN, Chamberlain C, Holbrook NM; University of Texas at Austin, Harvard University*
Temperate forests! How climate change affects growth and phenology

P3-238	*Bonfoey AM, Padda SS, Stahlschmidt ZR; U Pacific*	Effects of Spatiotemporal Variation in Temperature and Water Availability on a Riparian Insect Community
P3-240	*Cahill AE, Breen C, Stander R, Jost S, Hernandez R; Albion College*	Seasonal differences dominate spatial ones in an inland salt marsh community
P3-241	*Zinn D, Connor C, Watson CM; Midwestern State University*	Indications of stress in *Anolis oculatus* and *Anolis cristatellus* populations two years after Hurricane Maria
P3-242	*Clardy TR, Thomas BK, Das PB, Al-Nuwairah MA, Heinle MJ, Hikmawan TI, Prihartato PK, Abdulkader KA, Qurban MA; King Fahd University of Petroleum and Minerals, Environmental Protection Department*	Optimal temperatures for common copepods in the Western Arabian Gulf
P3-243	*Alba JC, Onthank KL; Walla Walla University*	Predatory Behavior of *Octopus rubescens* in Response to Elevated Carbon Dioxide and Temperature

Complementary to S10: Melding Modeling and Morphology: integrating approaches to understand the evolution of form and function

P3-244	*Howell BK, Hagey TJ, Winchell KM; Mississippi University for Women, Washington University in St Louis*	Adapting to Urban Habitats: How Toe Pad Shape Varies in Puerto Rican Anoles
P3-245	*Upadhyay A, Stayton TC, Hagey TJ; Mississippi University for Women, Bucknell University*	Convergent Evolution in Toe Pad Shape Across Pad Bearing Lizards
P3-246	*Hennessey PJ, Streicher JW, Cox CL; Georgia Southern University, Natural History Museum London, Florida International University*	Evolution of skull morphology during diversification in specialist snakes
P3-247	*Donatelli CM, Sanders E, Polavaram T, Toner M, Pfieffenberger J, Tytell ED; University of Ottawa, Tufts University*	A Thousand Fibers: The Functional Morphology of Fish Skin Collagen Fibers
P3-248	*Turner M, Clardy T, Donatelli CM; University of Washington, King Fahd University of Petroleum, University of Ottawa*	Bits and Pieces: Using Fractals to Understand Complex Morphology
P3-249	*Rolfe S, Winchester J, Pieper S, Boyer D, Summers A, Maga M*; University of Washington, Duke University, Isomics Inc*	SlicerMorph: Retrieve, Visualize and Analyze 3D Morphology with Open-Source
P3-250	*Sajdah-Bey N, Wyman J, Srinivas A, Sallan L; University of Pennsylvania*	The Hydrodynamic Effects of Pectoral Fins Attached to Back of the Skull in Extinct Cartilaginous Fishes (Iniopterygians)
P3-251	*Turner M, Clardy T, Donatelli CM; University of Washington, King Fahd University of Petroleum, University of Ottawa*	Bits and Pieces: Using Fractals to Understand Complex Morphology
P3-252	*Levy MG; University of California Berkeley*	Modeling the Developmental Shape Transition in the Morphogenesis of Cowrie Shells
P3-253	*Storch JD, Hernandez LP; George Washington University*	Calibrating Empirical Estimates of Theoretical Morphospace: A Phylometricmorphospace Approach

Tuesday Schedule of Events

Events take place in the JW Marriott Austin, unless otherwise noted

EVENT	TIME	LOCATION
Speaker Ready Room	7:00 AM – 10:00 AM	Room 405
Registration	7:30AM – 2:30PM	Grand Ballroom Foyer
Coffee Break AM	9:30 AM – 10:30 AM	Grand Ballroom
SPECIAL LECTURE		
Moore Lecture: Emily Graslie Prehistoric Road Trip: Crafting a Story 2 Billion Years in the Making	3:45 PM – 4:45 PM	Salon 5
SYMPOSIUM ORAL PRESENTATIONS		
S10: Melding Modeling and Morphology: integrating approaches to understand the evolution of form and function Chairs: Lindsay Waldrop, Jonathan Rader	7:45 AM – 3:30 PM	Lone Star D
S11: Integrative comparative cognition: can neurobiology and neurogenomics inform comparative analyses of cognitive phenotype? Chairs: Yuxiang Liu, Sabrina Burmeister	8:00 AM – 3:00 PM	Rooms 301-302
CONTRIBUTED PAPER ORAL PRESENTATIONS		
MORNING		
Session 107: Complementary to S7: Building Bridges from Genome to Phenome: Molecules, Methods and Models, Part I	8:00 AM – 9:45 AM	Lone Star A
Session 108: Twist and Turn	8:00 AM – 9:45 AM	Lone Star B
Session 109: Molecular Mechanisms Underlying Physiology, Performance and Life History	8:00 AM – 10:15 AM	Lone Star C
Session 110: Mechanics of Leftovers: Bone, Gristle and Sinew	8:00 AM – 9:45 AM	Lone Star F
Session 111: Dealing with Damage	8:00 AM – 9:30 AM	Lone Star G
Session 112: Bitchin Bioindicators	8:00 AM – 10:00 AM	Lone Star H
Session 113: Sensory Biology - Navigation and Sensing	8:00 AM – 9:45 AM	Rooms 303-304
Session 114: Complementary to S8: Long Limbless Locomotors Over Land: The Mechanics and Biology of Elongate Limbless Vertebrate Locomotion	8:00 AM – 9:30 AM	Room 205
Session 115: Animal Movement	8:00 AM – 9:30 AM	Rooms 201-202
Session 116: Reproduction & Development - Hormonally Speaking	8:00 AM – 9:45 AM	Rooms 203-204
Session 117: Reproduction and Sensory Biology	8:00 AM – 9:45 AM	Brazos
Session 118: Evolutionary Morphology and Modularity	8:00 AM – 9:30 AM	Rooms 402-403
Session 119: Complementary to S7: Building Bridges from Genome to Phenome: Molecules, Methods and Models, Part II	10:15 AM – 12:00 PM	Lone Star A
Session 120: Robot Chicken of the Sea	10:15 AM – 12:00 PM	Lone Star B
Session 121: Ionic and Osmotic Regulation: From Molecules to Organisms	10:30 AM – 12:00 PM	Lone Star C
Session 122: Into the Interstitial Matrix	10:15 AM – 12:00 PM	Lone Star F
Session 123: Growing Pains	10:00 AM – 12:00 PM	Lone Star G
Session 124: Huevos to Ninos-Larvae, Yolks and Hatching	10:30 AM – 11:45 AM	Lone Star H
Session 125: How Hormones Make Animals do What They do	10:15 AM – 11:45 AM	Rooms 303-304
Session 126: Social Communication and Competition	10:15 AM – 12:00 PM	Room 205
Session 127: “One Ant, One Bird, One Tree”, Biodiversity	10:30 AM – 11:45 AM	Rooms 201-202
Session 128: Behavioural Phenotypes	10:15 AM – 11:45 AM	Rooms 203-204
Session 129: Shedding Light on Adaptation and Co-evolution	10:15 AM – 12:00 PM	Brazos
Session 130: Take a Bow for the New “Evolution”- Evolutionary and Population Biology	10:30 AM – 12:00 PM	Rooms 402-403

AFTERNOON

Session 131: Find Food, Eat or be Eaten	1:30 PM – 3:15 PM	Lone Star A
Session 132: Paddles, Fins and Schools: Variety in Swimming Tools	1:30 PM – 3:15 PM	Lone Star B
Session 133: Muscle Physiology and Function	1:30 PM – 3:15 PM	Lone Star C
Session 134: Biological Velcro	1:30 PM – 3:15 PM	Lone Star F
Session 135: Playing with Shape: Plasticity	1:30 PM – 3:15 PM	Lone Star G
Session 136: Mechanisms of Development	1:30 PM – 3:15 PM	Lone Star H
Session 137: Complementary to S9: Applied Functional Biology: Linking Ecological Morphology to Conservation and Management	1:30 PM – 3:15 PM	Rooms 303-304
Session 138: Courtship Communication	1:30 PM – 3:30 PM	Rooms 201-202
Session 139: On Not-So-Solid Ground	1:30 PM – 3:15 PM	Rooms 203-204
Session 140: Comparative Genomics, Proteomics, Cell Type Evolution	1:30 PM – 3:30 PM	Brazos

COMMITTEE AND BOARD MEETINGS

Executive Committee with 2020 Symposium organizers and ICB Editors/Associate Editors	7:00 AM – 9:00 AM	Room 401
Executive Committee Meeting	7:45 AM – 9:00 AM	Room 409
Public Affairs Committee	12:00 PM – 1:30 PM	Room 408
IOB Editorial Board Meeting	12:00 PM – 1:30 PM	Room 406

WORKSHOPS AND PROGRAMS

Student Postdoctoral Affairs Committee Workshop: Transitions in Science Careers	12:00 PM – 1:30 PM	Lone Star E
Workshop: Building Bridges from Genome to Phenome: Molecules, Methods and Models	12:00 PM – 1:30 PM	Room 401
Workshop: 3D Visualization and Morphometrics with SlicerMorph	12:00 PM – 3:30 PM	Rooms 502-503

SOCIAL EVENTS

Morning Run	6:00 AM	JW Marriott Lobby
Society-wide social in honor of students and post-docs	5:00 PM – 7:00 PM	Griffin Hall

Tuesday Program Symposia

Note: Presenter is first author unless noted by an asterisk (*).

7:45 AM – 3:30 PM **Symposium S10** **Lone Star D**

Melding Modeling and Morphology: integrating approaches to understand the evolution of form and function

Chairs: Lindsay Waldrop, Jonathan Rader

7:45 am	**S10-0**	*Waldrop LD, Rader JA; Chapman University, UNC Chapel Hill*	Introduction to Melding Modeling and Morphology
8:00 am	**S10-1**	*Hebdon N, Ritterbush KA; University of Utah*	Seeing Spirals: Evaluating the hydrodynamic effect of changes in spiraling morphology of ammonoids
8:30 am	**S10-2**	*Anderson PSL; University of Illinois Urbana-Champaign*	Keep It Simple Stupid: Using simple models to explore how physical laws influence the evolution of biomechanical systems across clades
9:00 am	**S10-3**	*Battista NA; College of New Jersey*	Fluid-structure interaction for the people!
9:30 am	**Coffee Break**		**Grand Ballroom Foyer**
10:00 am	**S10-4**	*Dakin R, Segre PS, Berberi I, Altshuler DL; Carleton University, Stanford University, University of British Columbia*	Multilevel analysis of maneuvering performance and morphology in hummingbirds
10:30 am	**S10-5**	*Holzman R, Olsson K; Tel Aviv University*	Using performance landscapes to understand adaptive diversification within fishes
11:00 am	**S10-6**	*Muñoz MM, Anderson PSL, Hu Y, Patek SN, Camarillo H; Yale University, University of Illinois, Urbana-Champaign, Brown, Duke University*	How Predictable and Correlated are Patterns of Form-Function Evolution?
11:30 am	**Lunch Break**		
1:00 pm	**S10-7**	*Polly PD; Indiana University*	The landscape of adaptive landscapes: trade-offs between performance surfaces in space and time
1:30 pm	**S10-8**	*Rader JA, Mohammadi S, Hedrick TL, Waldrop LD; University of North Carolina, Chapman University*	Modeling diversification and constraint in avian wing morphology
2:00 pm	**S10-9**	*Salcedo MK, Hoffmann J, Donoughe S, Combes SA, Mahadevan L; Virginia Tech, Harvard University, University of Chicago, University of California Davis*	What's in a vein? Using computational tools to explore wing diversity and functional consequences of venation patterns on hemodynamics
2:30 pm	**S10-10**	*Waldrop LD, Mohammadi S, Rader JA, He Y; Chapman University, UNC Chapel Hill, University of North Texas*	Using uncertainty quantification to infer physical constraints on the evolution of fluid-structure functional systems
3:00 pm	**S10-11**	*Womack MC; National Museum of Natural History*	Disentangling intrinsic and extrinsic factors underlying anuran postcranial skeleton evolution

8:00 AM – 3:00 PM **Symposium S11** **Rooms 301-302**

Integrative comparative cognition: can neurobiology and neurogenomics inform comparative analyses of cognitive phenotype?

Chairs: Yuxiang Liu, Sabrina Burmeister

8:00 am	**S11-1**	*Burmeister SS, Liu Y; University of North Carolina, University of Texas Southwestern Medical Center*	Hippocampal transcriptomes are associated with cognitive ability in two species of frog
8:30 am	**S11-2**	*MacLean E, Gnanadesikan G, Bray E, Snyder-Mackler N; University of Arizona, Arizona State University*	Dog Diversity as a Natural Experiment in Cognitive Evolution
9:00 am	**S11-3**	*Ladage LD; Penn State Altoona*	Reptiles: an evolutionarily important link in comparative cognition and neurobiology
9:30 am	**Coffee Break**		**Grand Ballroom Foyer**

10:00 am	**S11-4**	*Chittka L; Queen Mary University of London*	The Mind of the Bee
10:30 am	**S11-5**	*Audet JN; Rockefeller University Field Research Center*	Comparative approaches for ecological and neurobiological correlates of innovation
11:00 am	**S11-6**	*Leal M, Powell JB; University of Missouri*	A Comparative Study of Behavioral Flexibility in *AnolisLizards*
11:30 am	**S11-7**	*Healy SD; University of St Andrews*	Using Neural Activation to Understand Nest Building in Birds
12:00 pm	**Lunch Break**		
1:30 pm	**S11-8**	*Liu Y; University of Texas Southwestern Medical Center*	The Era of Single-Cell Sequencing: Lessons from Comparative Cognition of Model Organism
2:00 pm	**S11-10**	*Burmeister SS; University of North Carolina*	Integrative Comparative Cognition
2:30 pm	**S11-11**	*Bingman VP; Bowling Green State University*	Avian Spatial Navigation and the Hippocampus: Can Diversity in Behavioral Mechanisms Guide Searches for a Genetics of Cognition?

Tuesday Program Morning Sessions

Note: Presenter is first author unless noted by an asterisk (*).

8:00 AM – 9:45 AM **Session 107** **Lone Star A**

Complementary to S7: Building Bridges from Genome to Phenome: Molecules, Methods and Models, Part I

Chairs: Richelle Tanner, Nicholas Teets

8:00 am	**107-1**	*Weaver RJ, Gonzalez B, Santos SR, Havird JC; University of Texas Austin, Hawaii Baptist Academy, Auburn University*	How does a shrimp become red? From molecules to putative genes underlying variation in red carotenoid coloration of *Halocaridna rubra*
8:15 am	**107-2**	*Dixon G, Matz MV; University of Texas at Austin*	Three-way genomic characterization (molecular evolution, gene expression, and DNA methylation) of the key morphological Innovation of the coral genus Acropora
8:30 am	**107-3**	*Zhao X, Million W, Kenkel C; University of Southern California*	Gene expression noise its role in coral responses to environmental variation
8:45 am	**107-4**	*Matoo OB, Montooth KL; University of Nebraska-Lincoln*	Ethanol, Flies and Metabolism: Linking Genotypes to Phenotypes
9:00 am	**107-5**	*Tanner RL, Gleason LU, Dowd WW; Washington State Univ, Sacramento State Univ*	Pathway-Dependent Patterns of Gene and Protein Expression Variation Exposed by Thermal Stress in the Intertidal Mussel
9:15 am	**107-6**	*Tomanek L, May M, Vasquez C, Todgham A; California Polytechnic State University, Univ California Davis*	From Cellular Omics to Phenomics: The Role of Sirtuins in the Cellular Stress Response
9:30 am	**107-7**	*Teets NM, Dalrymple EG, Hillis MH, Lee RE, Denlinger DL; University of Kentucky, Miami University, Ohio State University*	To Freeze or Not to Freeze: Cold Tolerance Strategies in an Antarctic Midge
9:45 am	**Coffee Break**		**Grand Ballroom Foyer**

8:00 AM – 9:45 AM **Session 108** **Lone Star B**

Twist and Turn

Chair: Frank Fish

8:00 am	**108-1**	*Goerig E, DiSanto V, Wainwright DK, Castro-Santos T, Akanyeti O, Liao J, Lauder GV; Harvard University, Stockholm University, Yale University, USGS Leetown Science Center, Aberystwyth University, University of Florida*	Comparative Undulatory Kinematics in Swimming Fishes: Rethinking Swimming Modes

8:15 am	**108-2**	*Akanyeti O, Fetherstonhaugh S; Aberystwyth University*	A kinematic chain model to quantify undulatory locomotion in animals and robots
8:30 am	**108-3**	*Thandiackal R, Lauder GV; Harvard University*	Turning in Zebrafish: Measuring Body Pressure, Torque, and Work During Spontaneous Turns
8:45 am	**108-4**	*Downs AM, Kolpas A, Block BA, Fish FE; West Chester University, Stanford University*	Turning Performance by Bluefin Tuna: Novel Mechanism for Rapid Maneuvers with a Rigid Body
9:00 am	**108-5**	*Segre PS, Goldbogen JA; Stanford University*	A computational framework for quantifying the maneuvering performance of free-swimming rorqual whales
9:15 am	**108-6**	*Leahy AL, Fish FE, Kerr SJ, Leftwich MC; West Chester University, George Washington University*	Value of the California Sea Lion (*Zalophus californianus*) Hindflippers during Porpoising and Turning Maneuvers
9:30 am	**108-7**	*Fish FE, Leahy AM, Kulkarni AA, Leftwich MC; West Chester University, George Washington University*	Hydrodynamics of a Crenelated Delta Wing Design of the Hindflippers of the California Sea Lion
9:45 am		**Coffee Break**	**Grand Ballroom Foyer**

8:00 AM – 10:15 AM **Session 109** **Lone Star C**

Molecular Mechanisms Underlying Physiology, Performance and Life History

Chairs: Rachel Davis, Kent Edmonds

8:00 am	**109-1**	*Bertucci EM, Parrott BB; University of Georgia*	Characterization of the Age-Related DNA Methylome and Development of an Epigenetic Age Predictor in Medaka (*Oryzias latipes*)
8:15 am	**109-2**	*Zikeli S, Yamada K, Yap K, Zhang Y, Kiaris H, Hood W; Auburn University, University of South Carolina*	Shy and Stressed? Correlations Between Corticosterone Level, Unfolded Protein Response, and Animal Personality
8:30 am	**109-3**	*Davis RL, Cristol DA, Heidinger BJ, Kittilson J, Swaddle JP; William & Mary, North Dakota State University*	Does lifetime methylmercury exposure impact telomere length in various organs within the zebra finch?
8:45 am	**109-4**	*Heine KB, Justyn NM, Hill GE, Tucker VL, Jung D, Pollock B, Hood WR; Auburn University*	Modeling Mitochondrial Behavior and Morphology from TEM Micrographs of Copepod Myocytes Following Ultraviolet Irradiation
9:00 am	**109-5**	*Mackessy SP; University of Northern Colorado*	A little variety goes a long way: Diversification of three-finger toxins in rear-fanged snake venoms
9:15 am	**109-6**	*Edmonds KE, Gibson L, Roederer L; Indiana University Southeast*	Corticosterone and Estradiol Regulation of Gastrointestinal (GI) Development and Reproduction in the Marsh Rice Rat (*Oryzomys palustris*)
9:30 am	**109-7**	*Titon Jr. B, Titon SCM, Assis VR, Barsotti AMG, Teixeira RV, Gomes FR; University of São Paulo*	Time-Related Inflammatory Response in *Rhinella diptycha* Toads
9:45 am	**109-8**	*Vandepas LE, Stefani C, Traylor-Knowles N, Browne WE, Goetz FW, Lacy-Hulbert A; National Oceanographic and Atmospheric Administration, Benaroya Research Institute, University of Miami, University of Washington*	Tick, Tick, Boom: Exploring diverse immune cell behaviors in ctenophores and oysters
10:00 am	**109-9**	*Klompen AML, Sanders SM, Cartwright P; University of Kansas Lawrence, University of Pittsburgh School of Medicine*	Hazardous Hydroids of Hydractinia: Variation in venom expression and nematocyte distribution in functionally distinct tissues of a hydractiniid hydrozoan
10:15 am		**Coffee Break**	**Grand Ballroom Foyer**

8:00 AM – 9:45 AM **Session 110** **Lone Star F**

Mechanics of Leftovers: Bone, Gristle and Sinew

Chairs: Hila Tzipora, Mason Dean

8:00 am	**110-1**	*Williams KL, Evans KM, Simons AM; University of Minnesota, Brown University*	The morphology of tooth replacement in Salariin Combtooth Blennies (Blenniiformes: Blenniidae: Salariini)
8:15 am	**110-2**	*Zack EH, Smith SM, Angielczyk KD; University of Chicago, Field Museum of Natural History*	Zoo Versus Wild: Trabecular Bone Architecture in Captive and Wild Xenarthra

8:30 am	**110-3**	*Ingle DN, Porter ME; Florida Atlantic University*	Cetacean vertebral trabecular bone mechanical properties and structure vary among swimming modes and diving behaviors
8:45 am	**110-4**	*Chase HT, Tobalske BW; University of Montana*	Bird to the Bone: Functional Adaptation in the Avian Wing
9:00 am	**110-5**	*Dean MN, Blumer M, Gualda E, Chaumel J, Seidel R, Marsal M, Omelon S; MPIKG*	Cartilage canals in ray skeletons: Morphology, homology and putative role in mineralization
9:15 am	**110-6**	*Chaumel J, Schotte M, Bizzarro J, Zaslansky P, Fratzl P, Baum D, Dean M; MPIKG, ZUSE, UCSC, Charité Hospital*	Are the cells in stingray mineralized cartilage performing the roles of bone cells? Quantitative analysis of the lacuno-canalicular network in stingray tesserae
9:30 am	**110-7**	*Mossor AM, Austin BL, Avey-Arroyo JA, Butcher MT; Youngstown State University, Sloth Sanctuary of Costa Rica*	Are sloths horses hanging upside down?: Suspensory adaptations of sloth flexor tendons

9:45 am **Coffee Break** **Grand Ballroom Foyer**

8:00 AM – 9:30 AM **Session 111** **Lone Star G**

Dealing with Damage

Chairs: Andrew Mountcastle, Vivek Prakash

8:00 am	**111-1**	*Gawne R, Levin M; Tufts University*	Planarian Head Shape Control: Regeneration Recapitulates Phylogeny
8:15 am	**111-2**	*Prakash VN, Bull MS, Prakash M; Stanford University*	Motility induced fractures reveal a ductile to brittle crossover in the epithelial tissues of *Trichoplax adhaerens*
8:30 am	**111-3**	*Mountcastle AM, Ahlholm PD, Stone I, Federico P, Nixon E, Johnson N; Bates College*	Effects of wing size and wingbeat frequency on wing wear in bumblebees
8:45 am	**111-4**	*Combes SA, Gagliardi SF, Wargin AH; UC Davis*	Wing damage isn't all bad for bumblebees: Asymmetric damage impairs maneuverability, but symmetric damage improves stability
9:00 am	**111-5**	*Kruppert S, Chu F, Stewart MC, Schmitz L, Summers AP; Friday Harbor Laboratories, University of Washington, Scripps College*	En Garde! The poachers' body armor is no show-off but a heavy defensive trait.
9:15 am	**111-6**	*Van Wassenbergh S, Böhmer C, Abourachid A; Universiteit Antwerpen, Muséum National D'Histoire Naturelle*	Analysis of the Shock Absorption Paradox in Woodpeckers

9:30 am **Coffee Break** **Grand Ballroom Foyer**

8:00 AM – 10:00 AM **Session 112** **Lone Star H**

Bitchin Bioindicators

Chair: Travis Wilcoxen

8:00 am	**112-1**	*Wilcoxen TE, Spence JM*; Millikin University*	Effects of cypermethrin on neurophysiology, development, and behavior of Cuban treefrog (*Osteopilus septentrionalis*) and American bullfrog (*Lithobates catesbeiana*) tadpoles.
8:15 am	**112-2**	*Marbach S, Xu W; Texas A&M University Corpus Christi*	The Toxic Effects of Nanoplastic Particles on Fish Embryonic Development
8:30 am	**112-3**	*Bain SR, Lower SE; Bucknell University, Bucknell University*	Using Environmental Factors to Predict the Emergence Patterns of Firefly Species in Pennsylvania
8:45 am	**112-4**	*Jones CLC, Huber RJ, Kim W, Prater C, Shafer ABA, Wagner ND, Frost PC; Trent University, Loughborough University, Baylor University*	Animal co-limitation by calcium and phosphorus revealed through experimental nutrigenomics
9:00 am	**112-5**	*Fetke JK, Flick RW, Martinson JW, See MJ, Pilgrim EM, Biales AD; University of Cincinnati, US EPA*	Investigating the effects of DNA methylation on EE2 induction of Estrogen Receptor alpha gene expression in fathead minnows (Pimephales promelas)
9:15 am	**112-6**	*Steele AN, Moore PA; Bowling Green St Univ, Univ of Michigan Biological Station*	Behavioral consequences of per- and poly-fluorinated alkyl substances (PFAS) exposure on Northern Michigan crayfish species

9:30 am	**112-7**	*Zahor DL, Glynn KJ, Chiparus S, Cornelius JM; Eastern Michigan University, Oregon State University*	Bioaccumulation of lead (Pb) in songbirds following the Flint, Michigan drinking water crisis
9:45 am	**112-8**	*Leigh SC, Paig-Tran M; California State University Fullerton*	The catch of the day is...plastic? The ingestion of microplastics by zooplankton in southern California

10:00 am ..... **Coffee Break** ..... **Grand Ballroom Foyer**

8:00 AM – 9:45 AM **Session 113** **Rooms 303-304**

Sensory Biology - Navigation and Sensing

Chair: Jamie LocPort

8:00 am	**113-1**	*Fitak RR, Wheeler BR, Naisbett-Jones LC, Scanlan MM, Noakes DLG, Johnsen S; University of Central Florida, Duke University, University of North Carolina, Oregon State University*	Time-dependent Characterization of Candidate Magnetoreception Genes in the Brain of Chinook Salmon
8:15 am	**113-2**	*Bressman NR, Hill JE, Ashley-Ross MA; Wake Forest University, University of Florida*	Why (and how) did the catfish cross the road? Chemoreceptive terrestrial orientation and amphibious natural history of the invasive walking catfish (*Clarias batrachus*)
8:30 am	**113-3**	*Granger J, Walkowicz L, Fitak RR, Johnsen S; Duke University, Adler Planetarium*	Gray Whales Strand More Often on Days With Increased Levels of Atmospheric Radio Frequency Noise
8:45 am	**113-4**	*McKee AA, Soto AP, Chen P, McHenry MJ; University of California Irvine*	The role of vision and flow sensing in schooling behavior
9:00 am	**113-5**	*Mhatre N; Western University*	Active amplification in tree cricket hearing
9:15 am	**113-6**	*Simonitis LE, Marshall CD; Texas A&M University at Galveston*	A Natural Occurring Shark Repellent: Ink has a Negative Effect on Shark Swimming Behavior
9:30 am	**113-7**	*LocPort JK, Daniel TL, Willis MA; University of Washington, Case Western Reserve University*	Agent-based Models of Insect Odor Tracking Based on Behavior Experiments

9:45 am ..... **Coffee Break** ..... **Grand Ballroom Foyer**

8:00 AM – 9:30 AM **Session 114** **Room 205**

Complementary to S8: Long Limbless Locomotors Over Land: The Mechanics and Biology of Elongate Limbless Vertebrate Locomotion

Chair: Christopher Kenaley

8:00 am	**114-1**	*Jurestovsky DJ, Usher L, Astley HC; University of Akron*	Propulsion via vertical undulation in snakes
8:15 am	**114-2**	*Kaba AK, Rieser JM, Paez VM, Astley HC, Goldman DI; Georgia Tech, Akron University*	Amplitude Modulation in Sidewinding Locomotion Driven by Contact Sensing Facilitates Movement in Heterogeneous Environments
8:30 am	**114-3**	*Rieser JM, Li TD, Goldman DI, Mendelson III JR; Georgia Tech, CUNY, Zoo Atlanta*	Evolutionary convergence in nanostructural adaptations in sidewinding viperid snakes
8:45 am	**114-4**	*Danforth SM, Larson JG, Davis Rabosky AR, Moore TY; Univeristy of Michigan*	A Kinematic Analysis of *Micrurus* Coral Snake Thrash Duration and Curvature Enables Quantitative Characterization of Non-Locomotory Behavioral Motion
9:00 am	**114-5**	*Paez L, Melo K, Ijspeert AJ; EPFL*	The advantage of gait of mosquito larvae over undulatory swimming
9:15 am	**114-6**	*Kenaley CP, Kraemer K, Kunkle H; Boston College*	Revisiting the Kinematic Parameters that Define Eel-like Swimming

9:30 am ..... **Coffee Break** ..... **Grand Ballroom Foyer**

8:00 AM – 9:30 AM **Session 115** **Rooms 201-202**

Animal Movement

Chair: Russell Wyeth

8:00 am	**115-1**	*Uehling JJ, Injaian AS, Taff CC, Winkler DW, Vitousek MN; Cornell Univ, Cellular Tracking Technologies*	The relationship between glucocorticoids and movement behavior during breeding in a free-living passerine

8:15 am	**115-2**	*Majoris JE, Foretich MA, Hu Y, Nickles KR, Di Persia CL, Chaput R, Schlatter E, Webb JF, Paris CB, Buston PM; Boston University, King Abdullah University of Science and Technology, University of Miami, University of Rhode Island, Boston College*	Neon Goby Larvae have Sufficiently Developed Sensory Systems and Swimming Abilities to Orient Directionally Beginning Shortly After Hatching
8:30 am	**115-3**	*Spierer AN, Mossman JA, Rand DM; Brown University*	Dissecting the genetic modifiers of flight performance using the Drosophila Genetic Reference Panel
8:45 am	**115-4**	*Wyeth RC, Ucciferri C, Youssef K, Stevens H; St Francis Xavier University*	Environment- Dependent Switching of Odour-Based Navigation Strategies by the Freshwater Gastropod, *Lymnaea stagnalis*
9:00 am	**115-5**	*Fuiman LA, Williams TM, Davis RW; University of Texas at Austin, University of California Santa Cruz, Texas A&M University - Galveston*	Underwater Navigation by Weddell Seals (*Leptonychotes weddellii*) in the Antarctic Fast-Ice Environment
9:15 am	**115-6**	*Kamran M, Pollock AMM, Dittman AH, Noakes DLG; Oregon State University, NOAA, Oregon Hatchery Research Center*	Homeward Bound: What the Salmon Nose Knows?

9:30 am **Coffee Break** **Grand Ballroom Foyer**

8:00 AM – 9:45 AM Session 116 — Rooms 203-204

Reproduction & Development - Hormonally Speaking

Chairs: Andrea Liebl, Aubrey Converse

8:00 am	**116-1**	*Martin RJ, Kruger MC, MacDougall-Shackleton SA, Sherry DF; Western University*	Temperature as a supplementary cue in the reproductive timing of the Black-capped chickadees (*Poecile atricapillus*)
8:15 am	**116-2**	*Assis BA, Avery JD, Tylan C, Earley RL, Langkilde T; Penn State, University of Alabama*	Honest Signaling, Sexual Conflict and Female Ornamentation: an Undesired Quality Signal?
8:30 am	**116-3**	*Gifford ME, Robinson CD; University of Central Arkansas, University of Virginia*	T3 as a source of hormonally-mediated maternal effects in a lizard
8:45 am	**116-4**	*Liebl AL, Duprey ER, Russell AF; University of South Dakota, University of Exeter*	What is the relationship between developmental stress hormones and adult helping behavior in a cooperatively breeding bird?
9:00 am	**116-5**	*Farrar VS, Viernes RC, Flores L, Calisi RM; University of California Davis*	Prolactin maintains a parental phenotype in both sexes of the biparental rock dove
9:15 am	**116-6**	*Converse A, Thomas P; University of Texas Marine Science Institute*	Female ZIP9-Knockout Zebrafish Exhibit Abnormal Egg Activation and Reduced Fecundity
9:30 am	**116-7**	*Whelan S, Hatch SA, Benowitz-Fredericks ZM, Chastel O, Elliott KH; McGill University, Institute for Seabird Research and Conservation, Bucknell University, CNRS–Université de La Rochelle, France*	Experimental effects of energy status on reproductive hormones, movement, and laying phenology of female black-legged kittiwakes

9:45 am **Coffee Break** **Grand Ballroom Foyer**

8:00 AM – 9:45 AM Session 117 — Brazos

Reproduction and Sensory Biology

Chair: Brooke Vetter

8:00 am	**117-1**	*Bastiaans E, Javaly N, O'Loughlin C, McCormick L, Wegrzyn P; SUNY Oneonta, Portland State University*	Can I Buy You a Drink? The Effect of Male Hydration Status on Male Mating Behavior and Female Life History in Bean Beetles
8:15 am	**117-2**	*Brown TA, Tsurusaki N, Burns M; UMBC, Tottori University*	Genotyping-By-Sequencing via 3RAD Capture to Determine Reproductive Mode in a Facultative Parthenogen
8:30 am	**117-3**	*Balebail S, Sisneros JA; University of Washington*	Relationship of advertisement call parameters with phenotypic traits in "singing" male plainfin midshipman
8:45 am	**117-4**	*Nowicki S, Caves EM, Schweikert LE, Green PA, Taboada C, Zipple MN, Peters S, Johnsen S; Duke University, University of Exeter, Florida International University*	Carotenoid Concentration in Avian Retinal Oil Droplets Correlates with Color Discrimination Across a Perceptual Category Boundary

9:00 am	**117-5**	*Florkowski MF, Yorzinski JL; Texas A&M University*	D2 Dopamine Receptor Activation Induces Aggression in Male House Sparrows (*Passer domesticus*)
9:15 am	**117-6**	*Bush JM, Ellison M, Simberloff D; University of Tennessee Knoxville*	Are brown anoles bullies? Insights into interactions between an invasive and native lizard species
9:30 am	**117-7**	*Vetter BJ, Sisneros JA; University of Washington*	The swim bladder enhances sound pressure sensitivity and bandwidth of the lagena in female plainfin midshipman (*Porichthys notatus)*

9:45 am ..... **Coffee Break** ..... **Grand Ballroom Foyer**

8:00 AM – 9:30 AM **Session 118** **Rooms 402-403**

Evolutionary Morphology and Modularity

Chair: Todd Oakley

8:00 am	**118-2**	*Fabre AC, Bardua C, Clavel J, Felice RN, Bonnel J, Blackburn D, Stanley E, Streicher J, Goswami A; NHM, UCL, University of Florida*	Morphological evolution of the head of Caudata is correlated to rapid diversification and dispersion during warming events
8:15 am	**118-3**	*Zelditch ML, Swiderski DL; University of Michigan, Ann Arbor*	An Incisor Runs Through It I. Variational modularity of the squirrel mandible
8:30 am	**118-4**	*Swiderski DL, Zelditch ML; University of Michigan, Ann Arbor*	An Incisor Runs Through It II. Evolutionary modularity of the squirrel mandible
8:45 am	**118-5**	*Conith AJ, Hope S, Liu M, Albertson RC; UMass Amherst*	The Developmental and Functional Origins of a Key Feeding Innovation in the Cichlid Pharyngeal Jaw
9:00 am	**118-6**	*Gómez-Bahamón V, Chen E, Assis M, Heming N, Marini M, Tuero D, Bates J; University of Illinois, Field Museum, University of Brasília, Universidad de Buenos Aires*	Egg Shape and Flight Capacity in Birds Implementing a Novel Geometric Model
9:15 am	**118-7**	*Martinez CM, Friedman ST, Corn KA, Larouche O, Price SA, Wainwright PC; University of California, Davis, Clemson University*	Large Mouths and Tapered Tails: Morphological Disparity Increases with Ocean Depth

9:30 am ..... **Coffee Break** ..... **Grand Ballroom Foyer**

10:15 AM – 12:00 PM **Session 119** **Lone Star A**

Complementary to S7: Building Bridges from Genome to Phenome: Molecules, Methods and Models, Part II

Chairs: Todd Oakley, Billie Swalla

10:15 am	**119-1**	*Vazquez-Medina JP, Allen KN, Torres-Velarde JM, Lam EK; University of California, Berkeley*	Primary tissue culture provides a system for functional genome-to-phenome investigations in marine mammals
10:30 am	**119-2**	*Musser JM, Schippers K, Nickel M, Kohn A, Moroz L, Arendt D; European Molecular Biology Laboratory, University of Florida*	Whole-body single-cell RNA sequencing reveals neural elements in a sponge
10:45 am	**119-3**	*Crawford K, Albertin CB, Koenig KM, Rosenthal J; St Mary's College of Maryland, Marine Biological Laboratory, Harvard University*	CRISPR-Cas9 Genome Editing in the Cephalopod Doryteuthis (Loligo) pealeii
11:00 am	**119-4**	*Swalla BJ, Fodor A, Lowe EK, Stolfi A; Friday Harbor Laboratories, University of Washington, Georgia Institute of Technology*	Tailless Molgulid Ascidians express Larval Pseudogenes
11:15 am	**119-5**	*Ragland GJ, Dowle EJ, Powell THQ, Feder JL, Hahn DA; University of Colorado Denver, University of Otago, State University of New York, University of Notre Dame, University of Florida*	Genome-wide variation and transcriptional changes in diverse developmental processes underly the rapid evolution of seasonality in a temperate fly
11:30 am	**119-6**	*Lenz PH, Roncalli V, Cieslak MC, Castelfranco AM, Hartline DK; University of Hawaii at Manoa, University of Barcelona*	Organism-Environment Interactions in Marine Zooplankton: Transcriptomic Characterization of a Copepod Phenome

11:45 am	**119-7**	*Oakley TH, Hensley NM, Ellis EA, Goodheart JA, Varney RM, Gerrish GA, Torres E; UCSB, U Alabama, UW-Madison, CSULA*	From Chaos Came Beauty: The Origin of a Novel Bioluminescence Gene with Ecosystem Impacts

12:00 pm **Lunch Break**

10:15 AM – 12:00 PM **Session 120** **Lone Star B**

Robot Chicken of the Sea

Chair: George Lauder

10:15 am	**120-1**	*Lauder GV, Wainwright DK, DiSanto V, White C, Zhu J, Bart-Smith H; Harvard Univ, Univ Virginia*	Tuna Robotics: Exploring the High-frequency Performance Space of Swimming Fishes
10:30 am	**120-2**	*White CH, Lauder GV, Bart-Smith H; University of Virginia, Harvard University*	Tuna robotics: impact of body flexibility and fin-fin interactions on swimming performance of a new tuna-inspired robotic platform
10:45 am	**120-3**	*Zhu JJ, Wainwright DK, Lauder GV, Bart-Smith H; University of Virginia, Harvard University*	Tuna robotics: design and control of an autonomous underwater vehicle inspired by tuna
11:00 am	**120-4**	*Wang J, Qi Z, Han P, Dong H, Wainwright DK, Lauder GV, Zhu J*, Bart-Smith H; University of Virginia, Harvard University*	Tuna robotics: Computational FSI optimization of a tuna tail-informed propulsor with high efficiency
11:15 am	**120-5**	*Howe SP, Astley HC; University of Akron*	Bio-inspired Control Algorithms Integrating Steady Swimming and Maneuvering in Fish Robots
11:30 am	**120-6**	*Robinson TL, Diaz K, Ozkan-Aydin Y, Wan KY, Goldman DI; Georgia Tech, University of Exeter*	Gait dynamics of a quadriflagellate robophysical model
11:45 am	**120-7**	*Ford MP, Santhanakrishnan A; Oklahoma State University*	Too close for comfort: importance of inter-appendage spacing in metachronal swimming performance

12:00 pm **Lunch Break**

10:30 AM – 12:00 PM **Session 121** **Lone Star C**

Ionic and Osmotic Regulation: From Molecules to Organisms

Chairs: Charles Booth, Kady Lyons

10:30 am	**121-1**	*Pipes BL, Nishiguchi MK; New Mexico State University*	mCherry-pHLuorin Tagging Illuminates the Role of Light Organ pH Modulation in the *Vibrio fischeri-Euprymna scolopes* Symbiosis
10:45 am	**121-2**	*Orr SE, Buchwalter DB; North Carolina State University*	It's All About the Fluxes: Temperature Influences Ion Transport and Toxicity in Aquatic Insects
11:00 am	**121-3**	*Starling JA, Guatam S, Howard LJ, Madsen SS, Tipsmark CK; University of Arkansas, University of Southern Denmark*	Salinity effects on water and salt transport components in the intestine of Atlantic killifish (Fundulus heteroclitus)
11:15 am	**121-4**	*Gillen CM, Piermarini PM, Romero MF; Kenyon College, Ohio State University, Mayo Clinic*	Electrogenic Sodium Transport by Insect Cation-Chloride Cotransporters?
11:30 am	**121-5**	*Lyons K, Wynne-Edwards KE; Georgia Aquarium, University of Calgary*	Legacy PCB Contamination Negatively Impacts Osmoregulatory Biomarkers in Pregnant Stingrays and their Embryos
11:45 am	**121-6**	*Ellis LV, Bollinger RJ, Weber HM, Madsen SS, Tipsmark CK; University of Arkansas, University of Arkansas and University of Southern Denmark*	Aquaporin Expression in the Gill of Japanese Medaka

12:00 pm **Lunch Break**

10:15 AM – 12:00 PM **Session 122** **Lone Star F**

Into the Interstitial Matrix

Chairs: Molly Gabler, Marianne Alleyne

10:15 am	**122-1**	*Gignac PM, Kley NJ; Oklahoma State University Center for Health Sciences, Stony Brook University*	At the nexus of iodine staining duration and specimen size: repeated-measures study to improve visualization of vertebrate soft-tissue anatomy using diceCT imaging

10:30 am	**122-2**	*Taylor MS, O'Brien HD, Gignac PM; Oklahoma State University Center for Health Sciences*	Shrinkage after swimming in iodine? Evaluating the use of hydrogel stabilization for reinforcing nervous tissues before iodine diffusion
10:45 am	**122-3**	*Smith MG, Westgate AJ, Koopman HN; Harvard University, UNC Wilmington*	Adipose tissue in diving animals: measuring the potential for gas exchange
11:00 am	**122-4**	*Jankauski MA; Montana State University*	On the Nonlinear Mechanics of the Honeybee Thorax
11:15 am	**122-5**	*Wei L, Reiter KE, McElrath TC, Dunn AC, Alleyne M*; University of Illinois at Urbana-Champaign, Illinois Natural History Survey*	The role of cuticular diffraction gratings in beetle iridescence, wetting and friction interactions
11:30 am	**122-6**	*Davis AL, Nijhout HF, Johnsen S; Duke University*	Convergent evolution of ultra-black butterfly scales
11:45 am	**122-7**	*Güell BA, Caldwell MS, Warkentin KM; Boston University, Gettysburg College, Boston University*	Treefrog egg-clutch biomechanics and their effect on embryo escape-hatching behavior
12:00 pm		**Lunch Break**	

10:00 AM – 12:00 PM **Session 123** **Lone Star G**

Growing Pains

Chair: Louis Zachos

10:00 am	**123-1**	*Zachos LG; University of Mississippi*	Matrix Models for Logistic Plate Growth in Sea Urchins
10:15 am	**123-2**	*Regan MC, Ashley-Ross MA; Wake Forest University*	Morphological Scaling and Ontogeny of Shark Caudal Fins
10:30 am	**123-3**	*Marce-Nogue J, Liu J; University at Buffalo*	Testing an Isometric Ontogenetic Model for Vibrations of Weberian Ossicles in Zebrafish
10:45 am	**123-4**	*Olroyd SL, Sidor CA; University of Washington, Burke Museum*	Allometry and porosity of the novel sound reception structure of chameleons
11:00 am	**123-5**	*Cheu AY, Bergmann PJ; Clark University*	Ontogenetic allometry of locomotor performance in basilisk lizards
11:15 am	**123-6**	*Green TL, Gignac PM; Oklahoma State University Center for Health Sciences*	Cassowary Casques are Lightning Rods for Speculation: Anatomical Development and Phenotypic Variation Clarifies Potential Biological Roles
11:30 am	**123-7**	*White HE, Tucker AS, Goswami A; Natural History Museum, King's College London*	Quantification of Suture Morphology in an Ontogenetic Framework across Laurasiatheria
11:45 am	**123-8**	*Graham ZG, Garde E, Heide-Jørgensen MP, Palaoro AV; Arizona State University, Greenland Institute of Natural Resources, Universidade Federal de São Paulo*	What is the Function of the Narwhal's Tusk? Insights from Morphology
12:00 pm		**Lunch Break**	

10:30 AM – 11:45 AM **Session 124** **Lone Star H**

Huevos to Ninos-Larvae, Yolks and Hatching

Chair: Douglas Pace

10:30 am	**124-1**	*Birch S, Plachetzki D; University of New Hampshire*	Investigating Sensory Integration and Settlement Responses to Sensory Stimuli in the Hydrozoan *Ectopleura crocea*
10:45 am	**124-2**	*Nguyen H, Hoang T, Hawkins D, Drechsler J, Nilsson P, Steiner B, Pernet B*; California State University Long Beach*	Are larvae of the sand dollar *Dendraster excentricus* food-limited in nearshore waters of southern California?
11:00 am	**124-3**	*Ellison A, Pace DA*; California State University Long Beach*	Protein metabolism and food-induced developmental plasticity during echinoid larval development
11:15 am	**124-5**	*Barkhouse JM, Newbrey JL, Newbrey MG; Columbus State University*	Laying-Sequence Variation in the Yolk Carotenoids of Eastern Bluebirds
11:30 am	**124-6**	*Newbrey JL, Love Q, Newbrey MG; Columbus State University*	Differences in Yolk Carotenoid Concentrations of Three Songbird Species Breeding in Nest Boxes in Georgia, USA
11:45 pm		**Lunch Break**	

10:15 AM – 11:45 AM **Session 125** **Rooms 303-304**

How Hormones Make Animals do What They do

Chairs: Aurora Solla, Roslyn Dakin

10:15 am	**125-2**	*Christiano BM, Howey CAF; University of Scranton, Penn State University*	Timber rattlesnakes (*Crotalus horridus*) that move more often maintain higher baseline corticosterone levels
10:30 am	**125-3**	*Solla AL, O'Rourke C, Anderson A, Renn SCP; Reed College*	Secret's in the Sauce: Hormones and Behavior in *Julidochromis marlieri*
10:45 am	**125-4**	*McMahon E, Youatt E, Braithwaite V, Cavigelli S; Pennsylvania State University*	Stability of behavioral traits and associated physiology
11:00 am	**125-5**	*Grace JK, Angelier F; Texas A&M University, Centre d'Etudes Biologiques de Chize*	Post-natal Glucocorticoids Negatively Affect Adult Anti-predator Behavior in House Sparrows
11:15 am	**125-6**	*Ryder TB, Dakin R*, Vernasco BJ, Evans BS, Horton BM, Moore IT; Smithsonian Institution, Carleton University, Virginia Tech, Millersville University*	Testosterone modulates status-specific patterns of cooperation in a social network
11:30 am	**125-7**	*Greville LJ, Pollock T, Decatanzaro D, Faure PA; McMaster University*	Seasonal Variation in Estradiol Transfer Among Male and Female Big Brown Bats

11:45 am **Lunch Break**

10:15 AM – 12:00 PM **Session 126** **Room 205**

Social Communication and Competition

Chair: Sarah Wofford

10:15 am	**126-2**	*Westerman EL, Ernst DA, Sullivan TJ; University of Arkansas, Gloucester Marine Genomics Institute*	The genetic basis of mate preference learning in *Bicyclus* butterflies
10:30 am	**126-3**	*Wofford SJ; Jacksonville State University*	Urine for a fight: Sex-based differences in crayfish contest signaling
10:45 am	**126-4**	*Rocco AJ, Wofford SJ; Jacksonville State University*	Battle of the Benthic: Studying Agonistic Interactions Between a Native and Invasive Crayfish Species
11:00 am	**126-5**	*Earl AD, Kimmitt AA, Simpson RK, Yorzinski JL; Columbia University, Indiana University, University of Windsor, Texas A&M University*	Female Ornamentation in a Lekking Bird: Bright Females Dominate
11:15 am	**126-6**	*Buchinger TJ, Fissette SD, Brant CO, Li K, Johnson NS, Li W; Michigan State University, US Geological Survey's Hammond Bay Biological Station*	A Pheromone Antagonist Liberates Female Sea Lamprey From a Sensory Trap
11:30 am	**126-7**	*Jones MM, Nuñez CMV*; University of Florida Gainesville, University of Memphis*	Rising up to the challenge of their rivals: mare behavior alters stallion response to opponent playback
11:45 am	**126-8**	*Reed AJ, Wofford SJ; Jacksonville State University*	Turn It Down! The Effects of Acoustic Stimuli on Contest Dynamics in Crayfish

12:00 pm **Lunch Break**

10:30 AM – 11:45 AM **Session 127** **Rooms 201-202**

"One Ant, One Bird, One Tree", Biodiversity

Chair: James Waters

10:30 am	**127-1**	*Goodman AM, Esposito LA; California Academy of Sciences*	Spatial and Ecological Niche Partitioning in Congeneric Scorpions
10:45 am	**127-2**	*Germeroth LM, Sumnicht TP, Verble RM; Missouri University of Science and Technology*	Maintaining Biodiversity of Ant Communities in the Crocker Range, Malaysian Borneo
11:00 am	**127-3**	*Waters JS; Providence College*	Ants of Providence
11:15 am	**127-4**	*Davis-Berg EC, Wilson BA, Arnold C, Almario-Kopp D; Columbia College Chicago, Liberty Public Schools, Prairie State College*	Molluscs of Anderson County Prairies, a native tallgrass prairie in Eastern Kansas

11:30 am	**127-5**	*Cerda PA, Crowe-Riddell J, Larson JG, Nagesan R, Callahan S, Rabosky DL, Davis Rabosky AR; University of Michigan*	Comparisons of Interspecific and Intraspecific Variation in Rear-Fanged Snake Venom Expression

11:45 am ..... **Lunch Break** .....

10:15 AM – 11:45 AM **Session 128** **Rooms 203-204**

Behavioural Phenotypes

Chair: Anna Dornhaus

10:15 am	**128-1**	*Foquet B, Song H; Texas A&M University*	Behavioral and molecular reaction norms of locust phase polyphenism in a phylogenetic frame work
10:30 am	**128-2**	*Hellmann JK, Bensky M, Zielinski C, Anderson S, Bell A; University of Illinois, Urbana-Champaign*	The Evolution of Sex-Specific Paternal Effects in Threespined Sticklebacks
10:45 am	**128-3**	*Stein LR, Hoke KL; University of Oklahoma, Colorado State University*	Parental and personal experience with predation risk interact in shaping phenotypes in a sex-specific manner
11:00 am	**128-4**	*Minicozzi MR, Axlid E, Wilson T, Buck CL, Von Hippel FA; Minnesota State University Mankato, Northern Arizona University*	Sodium perchlorate causes behavioral changes in developing zebrafish larva
11:15 am	**128-5**	*Ison T, Charbonneau D, Waugh A, Linksvayer T, Dornhaus A; University of Arizona, Arizona State University, University of Pennsylvania*	The Effects of Aging: Task Allocation and Inactivity in Two Ant Species
11:30 am	**128-6**	*Dornhaus A, Kelemen EP, Rivera MD; University of Arizona, York University, University of Illinois at Urbana-Champaign*	Designed for Comparative Advantage: Body size, Division of Labor, and the Benefits of Worse Workers in Bumble Bees

11:45 am ..... **Lunch Break** .....

10:15 AM – 12:00 PM **Session 129** **Brazos**

Shedding Light on Adaptation and Co-evolution

Chair: Emily Kane

10:15 am	**129-1**	*Cohen HE, Kane EA; Georgia Southern University*	When the Expected Doesn't Happen: A Lack of Local Adaptation in Trinidadian Guppies
10:30 am	**129-2**	*St. John ME, Martin CH; University of California - Berkeley*	A tale of scales and snails: behaviorally mediated traits drive the evolution of novelty in a radiation of *Cyprinodon* pupfishes
10:45 am	**129-3**	*Justyn NM, Heine KB, Peteya JA, Hood WR, Shawkey MD, Wang B, Hill GE; Auburn University, John Carroll University, Ghent University*	Persistence of Carotenoids in the Red Eyespots of Copepods (*Tigriopus californicus*) on Carotenoid-free Diets
11:00 am	**129-4**	*Huie JM, Thacker C, Tornabene L; University of Washington, Natural History Museum of Los Angeles County*	Co-evolution of cleaning and feeding morphology in Caribbean and eastern Pacific gobies
11:15 am	**129-5**	*Coryell RL, Nishiguchi MK; New Mexico State University*	Temperature Adaptation Influences Environmental and Symbiotic Fitness in the Squid-*Vibrio* Mutualism
11:30 am	**129-6**	*Gould A, Fritts-Penniman A; California Academy of Sciences*	Shedding light on specificity: the phylogeography of a bioluminescent symbiosis
11:45 am	**129-7**	*Bracken-Grissom HD, Deleo DM, Porter ML, Iwanicki T, Sickles J, Frank TM; Florida International University, University of Hawai'i at Mānoa, Nova Southeastern University*	Evidence for Extraocular Photosensitivity in the Bioluminescent Organs of Deep-sea Shrimp

12:00 pm ..... **Lunch Break** .....

10:30 AM – 12:00 PM **Session 130** **Rooms 402-403**

Take a Bow for the New "Evolution"-Evolutionary and Population Biology

Chair: Charles Watson

10:30 am	**130-1**	*Cirino LA, Lenga SH, Miller CW; University of Florida*	Males with damaged weapons produce more offspring in non-competitive environments
10:45 am	**130-2**	*Buser TJ, Summers AP, Sidlauskas BL; Oregon State University, University of Washington, Friday Harbor Laboratories*	Stags of the Sea? Cranial Weapon Morphology in The Fish Subfamily Oligocottinae (Pisces; Cottoidea)
11:00 am	**130-3**	*Krider L, Halsey L, Yap KN, Williams TD*; Simon Fraser University, University of Roehampton*	Humans Get Fat on Fat Diets, Why Don't Birds?
11:15 am	**130-4**	*Masonjones HD, Rose E*, Elson J; University of Tampa*	Nocturnal surveys of seahorses, *Hippocampus erectus*, reveal increased densities and seasonal recruitment patterns
11:30 am	**130-5**	*Watson CM; Midwestern State University*	Comparative Ecology and Physiology of Anoles on Dominica
11:45 am	**130-6**	*Chinn SM, Beasley JC; University of Georgia*	Parental investment strategies in a highly polytocous species: maternal attributes and resource availability modulate litter size and sex ratio

12:00 pm **Lunch Break**

Tuesday Program Afternoon Sessions

Note: Presenter is first author unless noted by an asterisk (*).

1:30 PM – 3:15 PM **Session 131** **Lone Star A**

Find Food, Eat or be Eaten

Chair: Bahnisikha Dutta

1:30 pm	**131-1**	*Lessig EK, Nonacs PN; University of California Los Angeles*	Foraging choices, learning, and behavior across paths that vary in risk
1:45 pm	**131-2**	*Dutta B, Goodisman MAD, Goldman DI; Georgia Institute of Technology*	Prey and mound manipulation by fire ant collectives
2:00 pm	**131-3**	*Schwaner MJ, Freymiller GA, Clark RW, McGowan CP; University of Idaho, San Diego State University*	A heightened vigilance state alters mechanics of jump backs in kangaroo rats (*D. deserti*)
2:15 pm	**131-4**	*Talal S, Farington R, Harrison JF, Cease AJ; Arizona State University*	Diet Preference and Requirements Shift Substantially with Age in the South American Locust (*Schistocerca cancellata*)
2:30 pm	**131-5**	*Wargin AH, Combes SA; University of California Davis*	BEEhavior under pressure: Testing the effects of barometric pressure change on bumblebee foraging behavior
2:45 pm	**131-6**	*Reichert MS, Kulahci IG, Davidson GL, Quinn JL; Oklahoma State University, University College Cork, Cambridge University*	Scrounging Versus Learning Strategies in Foraging Songbirds
3:00 pm	**131-7**	*Erdmann JA; Oklahoma State University*	Aggressive anglers, seductive serpents, and titillating toads: a discussion of luring and prey manipulation strategies

1:30 PM – 3:15 PM **Session 132** **Lone Star B**

Paddles, Fins and Schools: Variety in Swimming Tools

Chairs: James Townsend, Arvind Santhanakrishnan

1:30 pm	**132-1**	*Townsend JP, Gemmel BJ, Sutherland KR, Colin SP, Costello JH; Providence College, Marine Biological Laboratory, University of South Florida, University of Oregon, Roger Williams University*	Ink release and swimming behavior in an oceanic ctenophore, *Eurhamphaea vexilligera* Gegenbaur, 1856

1:45 pm	**132-2**	*Daniels J, Osborn K, Aoki N, Havassy J, Mushegian N, Katija K; Monterey Bay Aquarium Research Institute, Smithsonian Institution*	A Midwater Polychaete on the Move: Swimming of *Tomopteris*
2:00 pm	**132-3**	*Santhanakrishnan A, Ford MP; Oklahoma State University*	(Un)synchronized rowing: importance of phase lag in metachronal swimming performance
2:15 pm	**132-4**	*Lucas KN, Lauder GV, Tytell ED; University of Michigan, Harvard University, Tufts University*	Revisiting Dubois: the roles of positive and negative pressure in force production during fish swimming
2:30 pm	**132-5**	*Ruddy BT, Long Jr JH, Verma S, Porter ME; Florida Atlantic University, Vassar College*	Swimming efficiency influences schooling position of volitionally swimming blacktip sharks.
2:45 pm	**132-6**	*Xargay E, Barton K, Gough W, Adams D, Fish F, Antoniak G, Shorter KA; UMich, SU, CU, WCU, UM*	Inverse Dynamics Analysis of Dolphin Swimming
3:00 pm	**132-7**	*Wu C, Howle LE, Mcgregor AE, Mcgregor R, Nowacek DP; Duke University, University of Glasgow, HiDef Aerial Surveying Ltd*	Computational Fluid Dynamics Analysis of Gliding North Atlantic Right Whale Models with Variable Body Shapes

1:30 PM – 3:15 PM **Session 133** **Lone Star C**

Muscle Physiology and Function

Chairs: Andrea Rummel, David Williams

1:30 pm	**133-1**	*Levendosky MW, Lanier M, Bedore CN; Georgia Southern University*	Effect of Anesthesia Immersion on the Coral Catshark, *Atelomycterus marmoratus*
1:45 pm	**133-2**	*Tune TC, Ma W, Irving T, Sponberg S; Georgia Tech, Illinois Institute of Technology*	X-Ray Diffraction of Synchronous Flight Muscle Reveals Thick Filament Force-Length Hysteresis Varies With Muscle Function
2:00 pm	**133-4**	*Rummel AD, Faure PA, Smotherman MS, Swartz SM, Marsh RL; Brown University, McMaster University, Texas A&M*	Is Reduced Thermal Sensitivity in Distal Wing Muscles a Functional Adaptation to Bats' Unique Wing Morphology?
2:15 pm	**133-5**	*Williams CD, Knijnenburg TA; Allen Institute for Cell Science*	Spatial reorganization and clustering during the formation of myofibrils
2:30 pm	**133-6**	*Neurohr JM, Kinsey ST; University of North Carolina Wilmington*	The Impact of Tissue Aerobic Capacity and Life Stage on Oxidative Damage and Protein Turnover in Skeletal Muscle of the Blue Crab, *Callinectes sapidus*
2:45 pm	**133-7**	*Kirkpatrick A, Kanatous S, Crocker D, Trumble S; Baylor University, Colorado State University, Sonoma State University*	Fatty acids and Diving Development: Age class and sex differences in skeletal muscle fatty acid compositions the northern elephant seal *Mirounga angustirostris*
3:00 pm	**133-8**	*Gau JF, Lynch J, Gravish N, Sponberg S; Georgia Tech, UC San Diego*	Asynchronous properties of synchronous hawkmoth flight muscles

1:30 PM – 3:15 PM **Session 134** **Lone Star F**

Biological Velcro

Chairs: David Labonte, Adam Summers

1:30 pm	**134-1**	*Diaz C, Tanikawa A, Long JH; Vassar College, University of Tokyo*	Some Spider Glue is Super: Modeling the Fast Spreading Bioadhesive That Defeats the Scale Shedding Defense of Moths
1:45 pm	**134-2**	*Matherne M, Howington O, Lenaghan O, Hu DL; Georgia Tech*	The Effect of Nectar on the Honey Bee Pollen Pellet Removal Force
2:00 pm	**134-3**	*Mitchell CT, Drotlef D, Dayan CB, Sitti M, Stark AY; Villanova University, Max Planck Institute*	Peeling the layers back: Examining the roles of capillary adhesion and material softening on gecko and gecko-inspired synthetic adhesive performance in variable temperature and humidity
2:15 pm	**134-4**	*Cobos AJ, Higham TE; University of California Riverside*	Get a grip: the effect of asperity size on gecko adhesion
2:30 pm	**134-5**	*Labonte D; Imperial College London*	Dynamic biological adhesion: mechanisms for controlling attachment during locomotion

2:45 pm	**134-6**	*Yang DY, Gamel K, Flammang B, Shorter KA; University of Michigan, University of Akron, New Jersey Institute of Technology*	Modeling and Experimental Evaluation of Traditional and Remora-inspired Suction Cups
3:00 pm	**134-7**	*Summers AP, Trnski T, Hannam S, Conway KW; University of Washington, Auckland War Memorial Museum, Texas A&M*	A diversity of fishes that suck - New Zealand edition

1:30 PM – 3:15 PM **Session 135** **Lone Star G**

Playing with Shape: Plasticity

Chair: Craig Albertson

1:30 pm	**135-1**	*Akin DR, Geheber AD; Auburn University, University of Central Missouri*	Morphological divergence of a stream fish in altered flow: teasing apart the influences of natural selection and plastic response on body shape
1:45 pm	**135-2**	*Clifton IT, Chamberlain JD, Gifford ME; University of Toledo, Southern Arkansas University, University of Central Arkansas*	The Role of Phenotypic Plasticity in Morphological Differentiation Between Watersnake Populations
2:00 pm	**135-3**	*Seroy SK, Grunbaum D, Padilla DK; University of Washington, Stony Brook University*	Inducible morphology reveals adult dispersal between habitats
2:15 pm	**135-4**	*Charifson DM, Bourdeau PE, Padilla DK; Stony Brook University, Humboldt State University*	Shell remodeling may circumvent limits to phenotypic plasticity in the marine gastropod, *Nucella lamellosa*
2:30 pm	**135-5**	*Georgadarellis GL, Jiménez JM, Albertson RC; University of Massachusetts Amherst*	Increased Swimming Speed Induces Differential Bone Remodeling in Zebrafish
2:45 pm	**135-6**	*Lad SE, Cortese SA, Danison AD, Ravosa MJ; University of Notre Dame, College of Wooster*	Bone Remodeling and Cyclical Loading in the Maxilla of White Rabbits (*Oryctolagus cuniculus*)
3:00 pm	**135-7**	*Herbert AM, Wilga CD; University of Alaska Anchorage*	Varied tooth plate shape, varied diet: Morphology of Spotted Ratfish Tooth Plates

1:30 PM – 3:15 PM **Session 136** **Lone Star H**

Mechanisms of Development

Chair: Diego Biston Vaz

1:30 pm	**136-1**	*Hu Y, Harper M, Donahue J, Acosta B, McMenamin S; Boston College*	Thyroid Hormone Mediates Proximal-Distal Patterning in Zebrafish Fin Skeleton
1:45 pm	**136-2**	*Vaz DF, Hilton EJ; Virginia Institute of Marine Science, College of William & Mary*	When Five Means Four (and Something Else): Ontogeny of the Pectoral Fin of the Plainfin Midshipmen, *Porichthys notatus* (Batrachoididae: Batrachoidiformes), with implications to evolution of Batrachoidiformes
2:00 pm	**136-3**	*Funk EC, Kurpios NA, McCune AR; Cornell University*	Ventral-dorsal inversion of the air-filled organ (lungs, gas bladder) in vertebrates
2:15 pm	**136-4**	*Faltine-Gonzalez DZ, Layden MJ; Lehigh University*	Determining the role of oral-aboral patterning on neurogenesis in the sea anemone, *Nematostella vectensis*
2:30 pm	**136-5**	*Winchell CJ, Lee DT, Reyes-Rivera J, Rodriguez A, Torres MM, Weisblat DA; UC Berkeley*	Functional analysis, by CRISPR mutagenesis, of genes in the atomized Hox cluster of the leech *Helobdella austinensis*
2:45 pm	**136-6**	*Kishi Y, Brückner A, Thomas IM, Parker J; California Institute of Technology, Columbia University*	*Hox*-logic of Rove Beetle Chemical Weaponry
3:00 pm	**136-7**	*Albertin CB, Parnaik R, Ragsdale CW; Marine Biological Laboratory, University of Chicago*	Heterodox Ligands in an Ancient Signaling Center in Octopus Brain

1:30 PM – 3:15 PM **Session 137** **Rooms 303-304**

Complementary to S9: Applied Functional Biology: Linking Ecological Morphology to Conservation and Management

Chairs: Donald Miles, Diego Sustaita

1:30 pm	**137-1**	*Sustaita D, Farabaugh SM, Barthman-Thompson L; California State University San Marcos, San Diego Zoo Global, California Department of Fish and Wildlife*	Why morphology matters for management: the role of organismal form and function in wildlife conservation and management

1:45 pm	**137-2**	*Corbin CE, Roper VG; Bloomsburg University*	Linking Effects of Acid Mine Drainage to Ecology and Morphology of Riparian Birds
2:00 pm	**137-3**	*Gumm JM, Stanton M, Feuerbacher OG; Ash Meadows Fish Conservation Facility, USFWS*	Refuge Populations as Research Populations: Morphology, Reproduction and Ecology in a Captive Population of Devils Hole Pupfish
2:15 pm	**137-4**	*Moran CJ, Hudson D, Gerry SP; Citadel, Maritime Aquarium, Fairfield University*	Implications of muscle performance on the management of recreationally and commercially important fishes.
2:30 pm	**137-5**	*Pepper HE, Partin AM, Jenkins MS, Rowland JF, Burghardt GM; University of Tennessee, Knoxville*	Responses of Juvenile Eastern Garter Snakes (Thamnophis sirtalis) to Own, Littermate, and Control Chemicals
2:45 pm	**137-6**	*Reisenfeld K, McElroy E, Roosenburg W; College of Charleston, Ohio University*	Functional Ecomorphology in the Diamondback Terrapin (*Malaclemys terrapin*); the Effect of Head-starting on Morphology and Bite Force
3:00 pm	**137-7**	*Miles DB; Ohio University*	Can morphology predict the conservation status of iguanian lizards?

1:30 PM – 3:30 PM **Session 138** **Rooms 201-202**

Courtship Communication

Chair: Rosalyn Putland

1:30 pm	**138-1**	*Coomes CM, Derryberry EP; University of Tennessee Knoxville*	It's too darn hot: Effects of ambient temperature on singing behavior in male song birds
1:45 pm	**138-2**	*Echeverri SA, Zurek DB, Morehouse NI; University of Pittsburgh, University of Cincinnati*	Male *Habronattus pyrrithrix* Jumping Spiders Adjust Their Attention-Grabbing Courtship Display Based on Spatial and Environmental Context
2:00 pm	**138-3**	*Putland RL, Mackiewicz AG, Rogers LS, Mensinger AF; University of Minnesota Duluth, University of North Carolina, University of Washington*	Effect of anthropogenic sound on the communication space of the oyster toadfish, *Opsanus tau*
2:15 pm	**138-4**	*Gustison ML, Phelps SM; University of Texas at Austin*	Vocal activity is coupled to partner proximity and mating during pair-bonding in a monogamous rodent
2:30 pm	**138-5**	*Hood KE, Navarro E, Hurley LM; Indiana University*	Playback of female rejection vocalizations modifies male house mouse (*Mus musculus*) behavior
2:45 pm	**138-6**	*Anderson RC, Ziadi P, Niederhauser J; Florida Atlantic University*	Why so many song types? Song sharing, song type matching, and the agonistic function of song type repertoires in Bachman's sparrow
3:00 pm	**138-7**	*Falk JJ, Rubenstein D, Webster M; Cornell University, Smithsonian Tropical Research Institute, Columbia University*	Female hummingbirds with male-like coloration may avoid aggressive interaction at food resources
3:15 pm	**138-8**	*Duque FG, Monteros M, Nasir I, Uma S, Rodriguez-Saltos CA, Carruth L, Bonaccorso E, Wilczynski W; Georgia State U, Inst Nacional de Biodiversidad, Emory U, U San Francisco de Quito*	Dialects in the high-frequency song of a hummingbird

1:30 PM – 3:15 PM **Session 139** **Rooms 203-204**

On Not-So-Solid Ground

Chair: Brian Chang

1:30 pm	**139-1**	*Clifton GT, Holway D, Gravish N; Univ of California, San Diego*	The influence of uneven terrain and vision on ant walking
1:45 pm	**139-2**	*Soto D, Goldman DI; Georgia Institute of Technology*	Improving performance of a legged robot on bumpy ground via gentle tail taps
2:00 pm	**139-3**	*Mantilla DC, Tucker EL, Hsieh ST; Temple University*	Sand specialists and Non-specialists use Similar Kinematic Strategies for Running on Incline Granular Media
2:15 pm	**139-4**	*Chang B, Nowayti W, Hsieh ST; Temple University*	Force response of climbing sand dunes
2:30 pm	**139-5**	*Hubicki CM, Daley MA; Florida State University, University of California, Irvine*	Optimal control predictions of running behavior in cursorial birds: non-rigid terrain, scaling, and maneuvering

2:45 pm	**139-6**	*McGowan CP, Schwaner SJ, Lin DC; University of Idaho, Washington State University*	Muscle Dynamics During Hopping on Hard and Sandy Surfaces
3:00 pm	**139-7**	*Young JW, Wilson A, Phelp T, Dunham N; NEOMED, Cleveland Metroparks Zoo*	Effects of support diameter on vertical leaping performance in tree squirrels (*Sciurus carolinensis*)

1:30 PM – 3:30 PM **Session 140** **Brazos**

Comparative Genomics, Proteomics, Cell Type Evolution

Chairs: Jason Macrander, Leslie Babonis

1:30 pm	**140-1**	*Tarashansky AJ, Li P, Xue Y, Quake SR, Wang B*; Stanford University*	Cross-species mapping of cell type atlases identifies conservation and divergence in planarian and parasitic flatworms
1:45 pm	**140-2**	*Babonis LS, Ryan JF, Martindale MQ; Univ of Florida*	Things cells do
2:00 pm	**140-3**	*Brueckner A, Parker J; California Institute of Technology*	Single Cell Assembly of a Chemical Key Innovation in a Rove Beetle
2:15 pm	**140-4**	*Schnitzler CE, Nguyen AD, Koren S, Barreira SN, Gonzalez P, Chang ES, Phillippy A, Mullikin JC, Cartwright P, Nicotra ML, Frank U, Baxevanis AD*; U Florida, NHGRI/NIH, U Kansas, U Pittsburgh, NUI-Galway*	The Genomics of Hydractinia: Understanding Regeneration, Allorecognition, and Stem Cell Biology
2:30 pm	**140-5**	*Kolchenko S, Abdennur N, Loe-Mie Y, Plessier F, Saudemont B, Frintzenwanker J, Lowe C, Mirny L, Spitz F, Marlow H; University of Chicago, Institut Pasteur, MIT, Stanford University*	Evolution of Genome 3D organisation in Metazoa
2:45 pm	**140-6**	*Macrander J, Sachkova M, Surm J, Leach W, Ketchum R, Reitzel A, Moran Y; Florida Southern College, University of Bergen, Hebrew University of Jerusalem, University of North Carolina at Charlotte*	A Multi-omic Approach to Evaluate Environmental Influence and Population Dynamics of Venom Production in *Nematostella vectensis*
3:00 pm	**140-7**	*Lewis ZR, Dunn CW; Yale University*	UV Tolerance in the Portuguese Man of War (*Physalia physalis*)
3:15 pm	**140-8**	*O'Connell J, Shamble P, Koenig K*; Standford University, Harvard University*	Comparative Lens Proteomics Across Aves

3:45 PM – 4:45 PM **MOORE Lecture** **Salon 5**

Moore Lecture	*Graslie EG; Field Museum*	Prehistoric Road Trip: Crafting a Story 2 Billion Years in the Making

Keyword Index

C

D

E

F

G

H

I

J

K

L

M

N

O

P

Q

R

S

T

U

V

W

X

Z

Author Index

A

B

Author Index

C

D

E

F

G

H

I

J

K

Author Index

L

M

Author Index

N

O

P

Author Index

Q

R

S

Author Index

T

U

V

W

X

Y

Z

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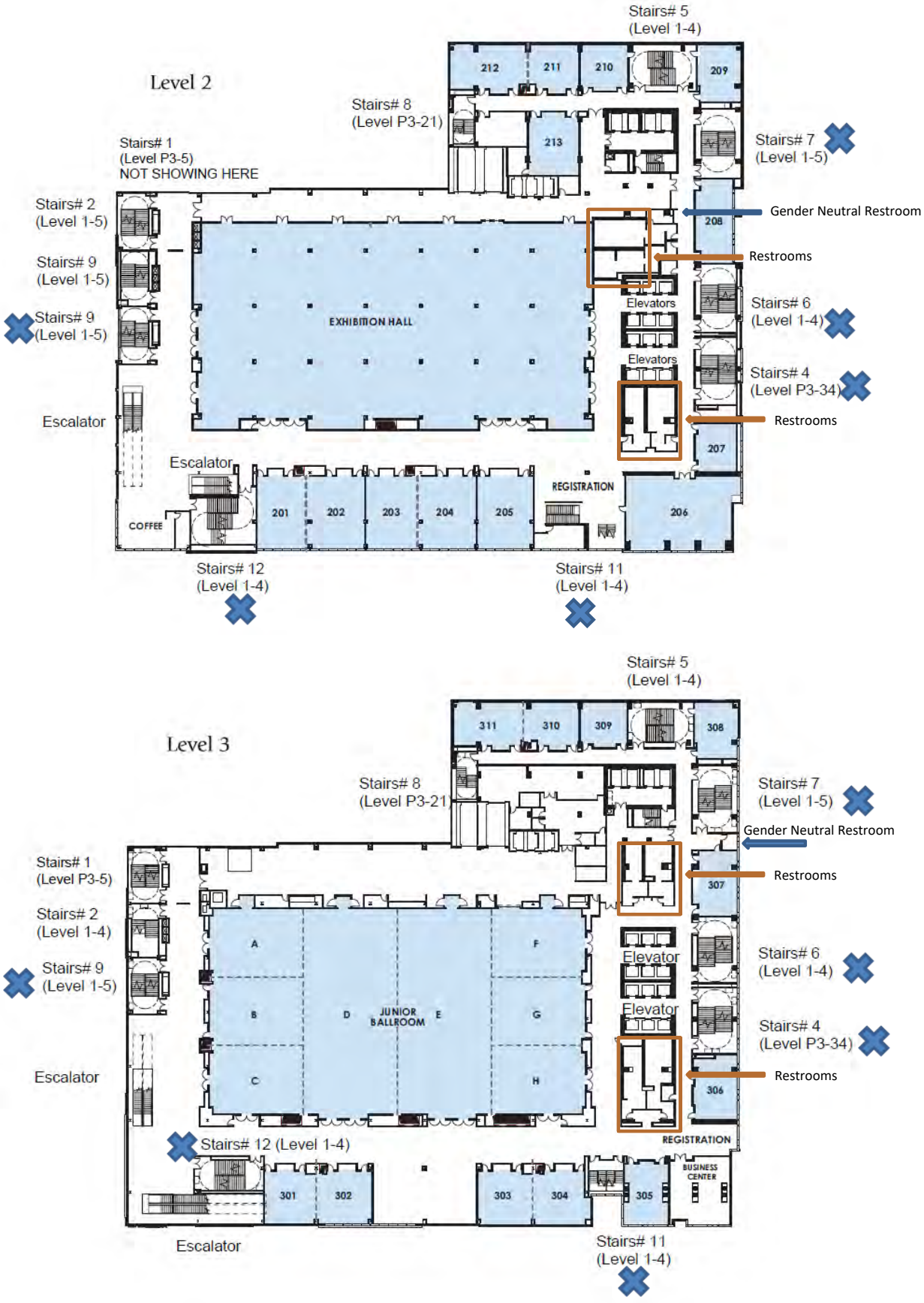

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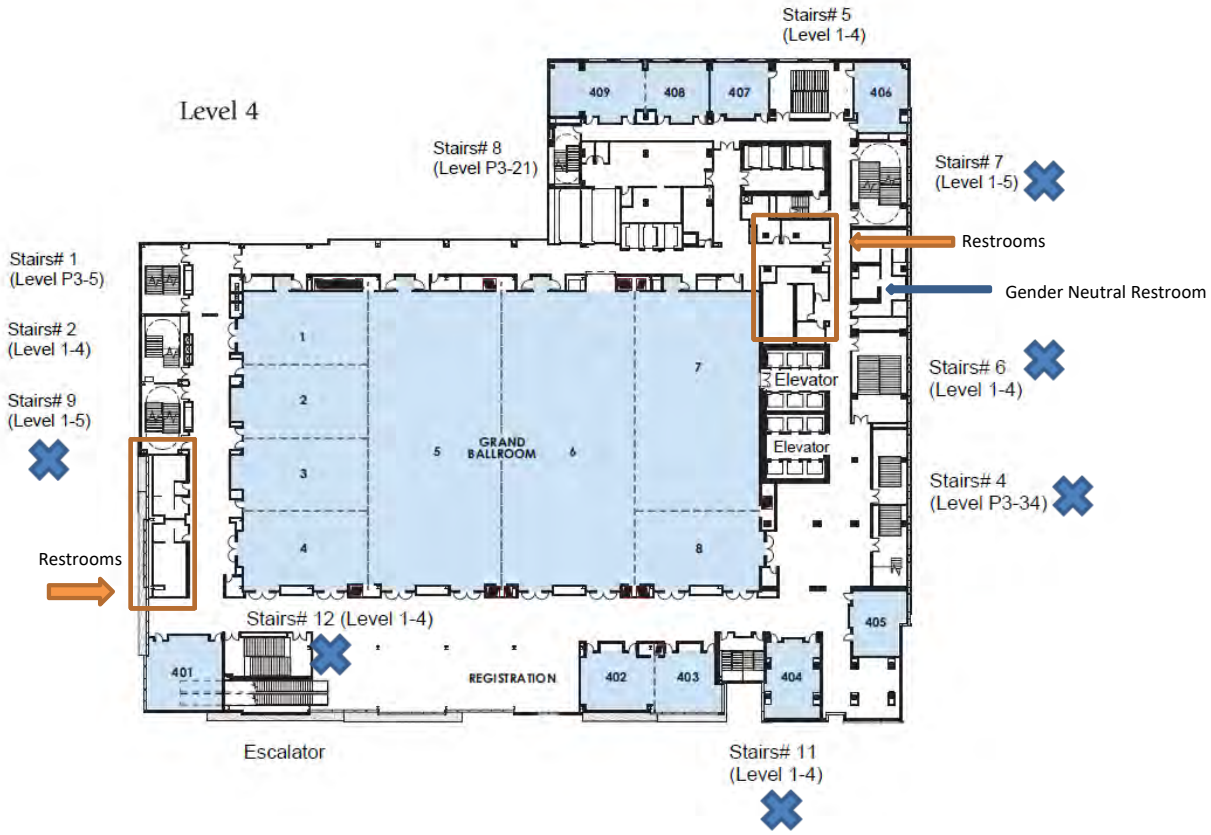

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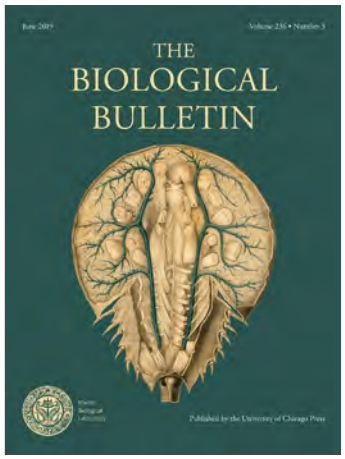

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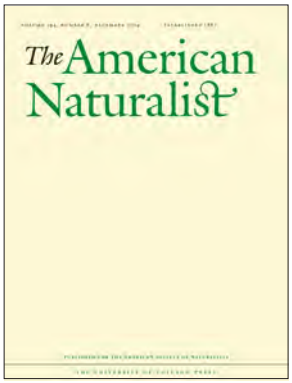

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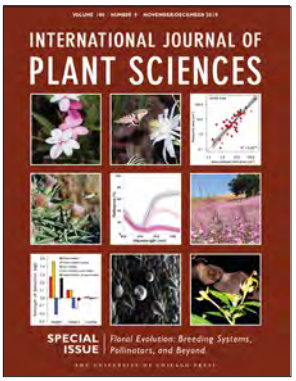

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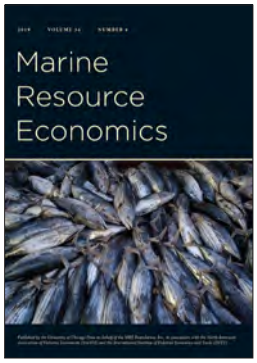

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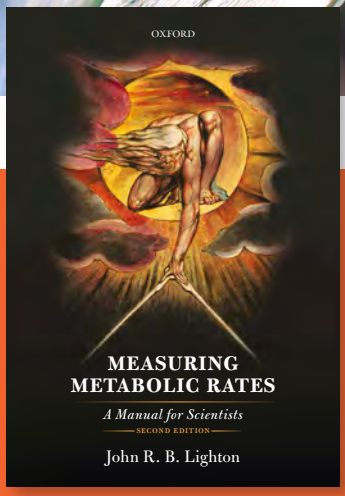

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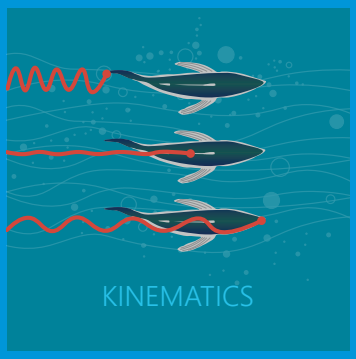

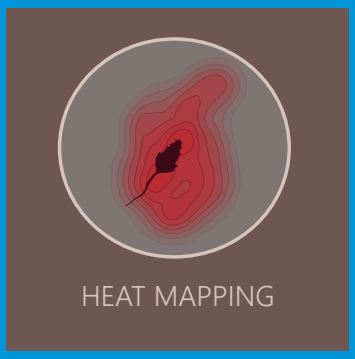

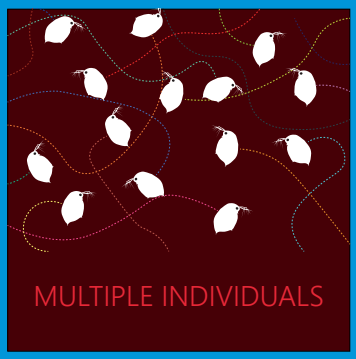

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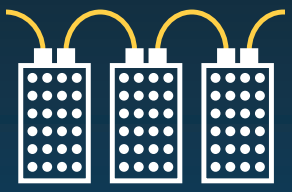

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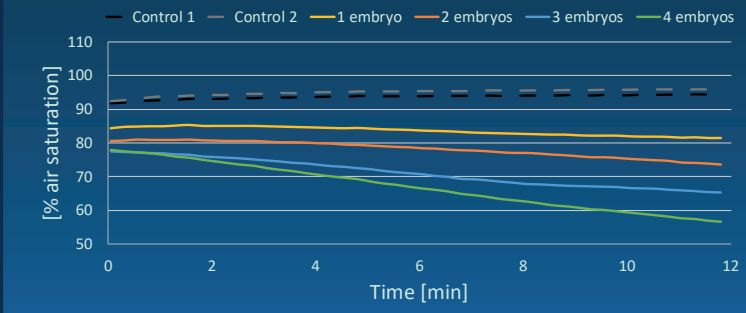

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