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with the
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FINAL PROGRAM

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Tampa Convention Center
3-7 January 2019

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The Society for Integrative and Comparative Biology

FINAL PROGRAM

Tampa Marriott Waterside

700 S Florida Avenue

Tampa, FL 33602, USA

Tampa Convention Center

333 S Franklin Street

Tampa, FL 33602, USA

Future Meeting Dates

3-7 January 2020
Austin, Texas

3-7 January 2021
Washington, District of Columbia

3-7 January 2022
Phoenix, Arizona

The Society for Integrative and Comparative Biology

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Welcome to Tampa
Message from the President

The 2019 annual meeting of the Society for Integrative and Comparative Biology celebrates another year of success and prosperity for our Society. Welcome to the main event!

SICB is a very student-friendly and student-oriented society. More than half of our attendees are students and many of SICB's full members started out as student members. Our emphasis on nurturing the next generation of scientists is well-placed. Our student-support programs are first-rate and you will see much evidence for this at the meeting.

SICB has made great strides in broadening the participation in our science to all groups, but especially underrepresented groups. We take great pride in this and will continue our efforts as we help to train the next generation of scientists.

SICB also supports families. We have provided child-care services at the annual meeting for a number of years. But for the first time, SICB is providing quality child-care services throughout the meeting at no additional cost to those using the service.

SICB is also committed to providing a meeting environment that fosters open dialogue and the exchange of scientific ideas. 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. SICB strives to create at its meetings an environment free from harassment and discrimination. The SICB annual meeting should serve as an effective forum to consider and debate science-relevant viewpoints in a respectful, civil, and fair manner. Meeting participants are expected to uphold standards of scientific integrity and professional ethics and must comply with these standards of behavior. Harassment and other forms of misconduct undermine the integrity of SICB meetings and are strictly prohibited.

The Program Committee led by Program Officer Susan Williams and Program Officer-Elect Jake Socha has put together remarkable scientific sessions and workshops with stimulating symposia. We know you will find them all educational and rewarding.

This year marks the inaugural year of our new journal *Integrative Organismal Biology* led by editor Adam Summers. Articles are now in the pipeline for publication this spring. Our longstanding journal *Integrative and Comparative Biology* continues to publish proceedings from our symposia and abstracts for the annual meeting. We will announce the new editor for *ICB* at this meeting.

The SICB endowment continues to support many of our activities at the annual meeting. Our members have been generous in supporting the various funds in the endowment and our **Double-Your-Dues** Campaign has endeavored to boost support to our student research fund, calling on all members, including students, to give back to the society in an important way.

Our Meeting Manager Lori Strong and her group at our management company, Burk and Associates, Inc., assist the Program Committee and are there every second of our meeting making sure things run smoothly. Please drop by the registration desk and thank them for their herculean efforts.

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 this year to acknowledge **Sable Systems International** as a platinum sponsor. Sable Systems has been an important presence at our meetings for many, 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 Presentations. **Xcitex** and **Friday Harbor Labs** return to SICB as silver sponsors. We welcome **Arbor Assays**, **Aurora Scientific**, and **TSI Incorporated** as new silver sponsors and **BioOne Complete** as a new 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, SICB works so well because we have 160 individuals who serve the Society as officers, committee members, and editorial board members. These people volunteer their time to make SICB a healthy and active enterprise that strongly supports its members and takes pride in a vibrant and active student membership. You can do your part by volunteering to serve and by continuing your membership.

I hope you enjoy the 2019 Annual Meeting of SICB!
Louis E. Burnett

Welcome to Tampa
Message from the Program Officer

Welcome to the SICB Annual Meeting in Tampa, Florida! It's been 39 years since SICB has been held in Tampa, but it was not so long ago that we enjoyed the mild January weather of West Palm Beach (2015). Let's hope we get the same great weather this year so you can enjoy some of the local sites. However, after perusing the abstracts, you probably won't want to miss too much of the scientific program. There are 4 days of jam-packed science, with a total of 141 oral sessions, 3 poster sessions, 12 full-day symposia, and a number of exciting lectures and workshops. The entire schedule grid is on our website at www.sicb.org/meetings/2019/SICB2019grid.pdf for a quick guide to where and when everything occurs. For the more technologically-inclined, we have a mobile meeting app to keep you organized.

Major lectures: We are excited to open the annual meeting on Thursday, January 3rd at 7:30 with our Plenary Lecture presented by Peter Wainwright. Successive evenings will hold the Bartholomew Lecture by Ben Dantzer (Friday, January 4, 7:00 PM); the Bern Lecture by Michael Romero and the AMS Lecture by Bruce Conn (both Saturday, January 5, 7:00 PM). We will conclude the meeting with the Moore Lecture by Kevin Padian (Monday, January 7, 3:45 PM).

Symposia: Twelve symposia were selected by the Program Committee and represent the diversity of the 11 divisions of SICB. These symposia represent cutting-edge research and syntheses all with an eye toward establishing the future of specific research areas. These symposia represent the hard work and creativity 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/2019/symposia/index.php.

Special Focus Meeting on Organismal Botany: This year we are highlighting research on plants through a series of coordinated events, starting with a full-day symposium on Integrative Plant Biology on January 4. On January 5, there will be a student presentation competition (Rising Star Award in Organismal Botany), a Botany at SICB organizational meeting and lunch social, a complementary oral session to the Integrative Plant Biology Symposium, and an Organismal Botany Poster Session. More information can be found here: sicb.org/meetings/2019/specialfocus.php.

Workshops: This year there are workshops galore! Many of our committees offer professional development workshops – topics this year range from public speaking to creating effective posters. Back by popular demand is the Sketch Notes workshop on visual note-taking. In addition, we have a number of science-related workshops that take in-depth dives into specific topics or analytic methods; some of these workshops are complementary to a symposium. Finally, we welcome back NSF Program Officers to the annual meeting to give 2 workshops on core and special grant programs. Our workshop website provides more information on these opportunities: sicb.org/meetings/2019/workshops.php.

Socials: Part of our programming includes many organized social events for catching up with friends and colleagues or meeting new people. After the Plenary Lecture on January 3, join us for the society-wide welcome reception from 8:30 PM – 10:00 PM. End the meeting with the society-wide party in honor of students and post-docs on January 7 from 5:00 – 7:00 PM. In between, you can join one of the many division or affiliated society (AMS and TCS) socials or the Broadening Participation social.

Business meetings: Business meetings are a great opportunity to hear about the activities of your division and the society. We keep them short and sweet so that you attendees can grab dinner or attend an evening event. It is also a great way to see how you can become an active member of the society.

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 Officers, committee chairs, and our great team from Burk & Associates: Brett Burk, Lori Strong, Jennifer Rosenberg, Raelene Sok, Jill Drupa, Mary Lou Scarbrough, Heide Rohland and Ruedi Birenheide. We hope that you will enjoy the meeting, find inspiration in the presentations, and establish new friendships and collaborations!

Susan Williams, SICB Program Officer

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Co-Sponsoring Societies

American Microscopical Society (AMS)

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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 Tampa Convention Center, unless otherwise noted

Thursday 3 January

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

Plenary Session: Dr. Peter Wainwright
7:30 PM – 8:30 PM, Ballroom B
The Plenary Address, "Key Innovation and Diversity in Fish Jaws: A SICB Story" will be given by Dr. Peter Wainwright, Past-President of SICB and Professor in the Department of Evolution and Ecology at the University of California Davis.

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

SICB Special Focus Meeting: Organismal Botany

This 'meeting within a meeting' will offer a focused opportunity for researchers studying photosynthetic organisms at the organismal level to meet with each other and also with other organismal biologists in SICB. Examples of organismal botany fields emphasized will include morphology, physiology, biomechanics, paleontology, ecological adaptation, scaling, evolutionary developmental and comparative biology.

Friday 4 January

Symposium S1: Integrative Plant Biology
7:45 AM – 3:30 PM, Room 18

Saturday 5 January

Presentations for the Rising Star in Organismal Botany Award - Session 37
8:00 AM – 10:00 AM, Room 1 & 2

Botany at SICB Organizational Meeting and Social Event
12:00 PM – 1:30 PM, Room 30A

Complementary to S1: Integrative Plant Biology Session 60
1:30 PM – 3:30 PM, Room 1 & 2

Special Focus Meeting on Organismal Botany Posters
3:30 PM – 5:30 PM, Central Exhibit Hall

Friday 4 January

Poster Session 1
3:30 PM – 5:30 PM, Exhibit Hall
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
8:00 PM – 10:00 PM, The Landing, 2nd Floor

Saturday 5 January

500 Women Scientists Meetup
12:00 PM – 1:30 PM, Room 3-4
A discussion about making science open, inclusive, and accessible. All are welcome to attend.

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

Libbie Hyman Auction & TCS/DEDB/DPCB/AMS/DIZ/DEE Social
7:30 PM – 9:00 PM, Il Terrazzo, Marriott

DCE/DEDE/DAB/DNNSB Social
8:00 PM – 10:00 PM, The Landing, 2nd Floor

DVM/DCB Social
9:00 PM – 12:00 AM, American Social (Offsite)

Sunday 6 January

Poster Session 3
3:30 PM – 5:30 PM, Exhibit Hall
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
5:30 PM – 6:30 PM, Room 14 & 15
SICB Society Meeting & Awards Presentation

Broadening Participation Social
7:00 PM – 9:00 PM, Il Terrazzo, Marriott

Monday 7 January

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

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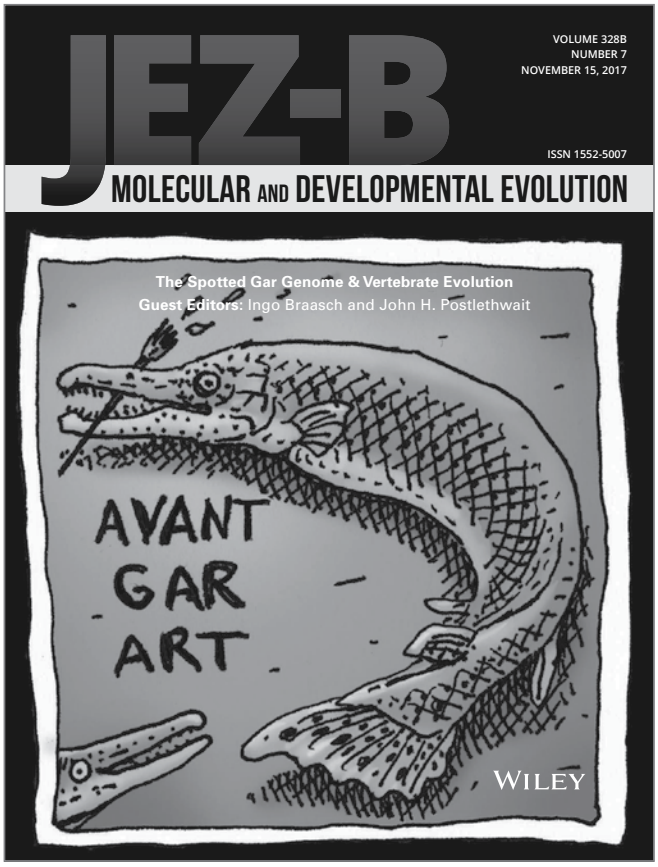

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SICB and Divisional Business Meetings

Friday 4 January

DAB Meeting, 5:45 PM – 6:30 PM, Room 18
DNNSB Meeting, 5:45 PM – 6:30 PM, Room 19
DCPB Meeting, 5:45 PM – 6:30 PM, Room 20
DVM Meeting, 5:45 PM – 6:30 PM, Room 21
DEE Meeting, 5:45 PM – 6:30 PM, Room 22
DEDE Meeting, 5:45 PM – 6:30 PM, Room 23
DEDB Meeting, 5:45 PM – 6:30 PM, Room 24

Saturday 5 January

TCS Business Meeting, 12:00 PM – 1:30 PM, Room 3 & 4
AMS Business Meeting, 12:00 PM – 1:30 PM, Room 1 & 2
DCE Meeting, 5:45 PM – 6:30 PM, Room 18
DCB Meeting, 5:45 PM – 6:30 PM, Room 19
DIZ Meeting, 5:45 PM – 6:30 PM, Room 20
DPCB Meeting, 5:45 PM – 6:30 PM, Room 21

SICB Society Business Meeting & Awards Presentation
Sunday 6 January, 5:30 PM – 6:30 PM, Room 14 & 15

Special Lectures

Plenary Lecture: Dr. Peter Wainwright
Thursday 3 January, 7:30 PM – 8:30 PM, Ballroom B
Key Innovation and Diversity in Fish Jaws: A SICB Story

Bartholomew Lecture: Dr. Ben Dantzer
Friday 4 January, 7:00 PM – 8:00 PM, Room 14-17
Plasticity, Hormones, Behavior, and Fitness: Understanding the Long-Reach of the Mother in Wild Animals
Sponsored by Sable Systems

AMS Lecture: Dr. Bruce Conn
Saturday 5 January, 7:00 PM – 8:00 PM, Room 12 & 13
Functional Morphology Meets Infectious Disease Epidemiology: How Parasitic Flatworms Move Between and Within Hosts

Bern Lecture: Dr. Michael Romero
Saturday 5 January, 7:00 PM – 8:00 PM, Room 14-17
Scared, Cold, and Hungry – Stress from the Arctic to the Equator

Moore Lecture: Dr. Kevin Padian
Monday 7 January, 3:45 PM – 4:45 PM, Room 14-17
Lessons from the “Intelligent Design” Trial: Explaining Evolution and Climate Science in a “Post-Evidentiary World”

The Exhibits will open on Friday 4 January at 9:30 AM. Tampa Convention Center, Central Exhibit Hall, will be the location for coffee breaks Friday through Monday mornings from 9:30 AM – 10:30 AM, and 3:30 PM – 4:30 PM Friday through Sunday during the poster sessions.

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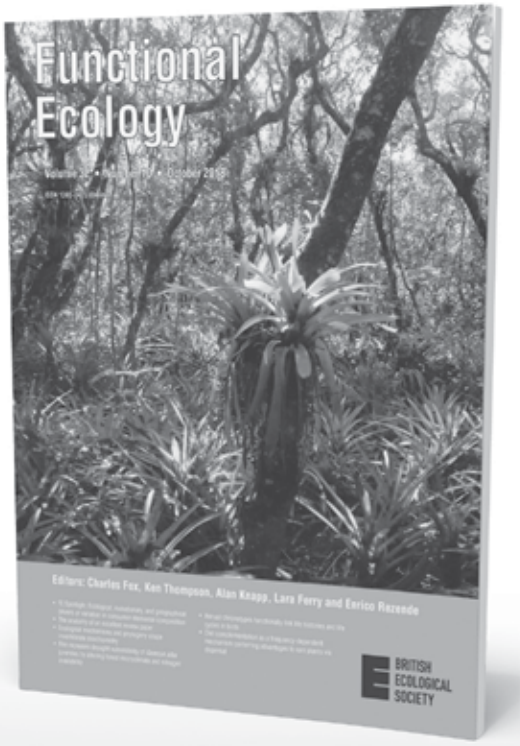

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Find out more here **bit.ly/BESJournals**

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Symposia

Friday 4 January

S1: Integrative Plant Biology
Sponsors: *DAB, DCB, DCE, DCPB, DEDB, DEDE, DEE, DIZ, DNNSB, DPCB, DVM, AMS, TCS*
Sponsored by: *NSF Macroecology of Infectious Disease Research Coordination Network (RCN)*

S2: The Scale of Sickness: How Immune Variation Across Space and Species Affects Infectious Disease Dynamics
Sponsors: *DAB, DCE, DEDE, DEE*
Sponsored by: *National Science Foundation*

S3: Playing with Power: Mechanisms of Energy Flow in Organismal Movement
Sponsors: *DCB, DNNSB, DVM*
Sponsored by: *Company of Biologists*

Saturday 5 January

S4: Adaptation and Evolution of Biological Materials
Sponsors: *DCB, DCPB, DEDB, DEE, DIZ, DVM, AMS*
Sponsored by: *Company of Biologists, Bioinspiration and Biomimetics, Micro Photonics, Overleaf Foundation, Thermo Fisher Scientific, Materials Research Society*

S5: Stress Phenotype: Linking Molecular, Cellular, and Physiological Stress Responses to Fitness
Sponsors: *DAB, DCE, DCPB, DNNSB*
Sponsored by: *National Science Foundation*

S6: Beyond the Powerhouse: Integrating Mitonuclear Evolution, Physiology, and Theory in Comparative Biology
Sponsors: *DCPB, DIZ, DPCB, TCS*
Sponsored by: *Company of Biologists, National Science Foundation*

Sunday 6 January

S7: Comparative Evolutionary Morphology and Biomechanics in the Era of Big Data
Sponsors: *DCB, DCE, DEDB, DEE, DNNSB, DPCB, DVM*
Sponsored by: *National Science Foundation*

S8: Multifunctional Structures and Multistructural Functions: Functional Coupling and Integration in the Evolution of Biomechanical Systems
Sponsors: *DCB, DEDB, DVM, AMS, TCS*
Sponsored by: *National Science Foundation*

S9: Chemical Responses to the Biotic and Abiotic Environment by Early Diverging Metazoans Revealed in the Post-Genomic Age
Sponsors: *DEDE, DNNSB, DPCB, AMS*
Sponsored by: *Leverhulme Trust, National Science Foundation*

Monday 7 January

S10: The World is Not Flat: Accounting for the Dynamic Nature of the Environment as We Move Beyond Static Experimental Manipulations
Sponsors: *DAB, DCE, DCPB, DEDE, DEE, DNNSB*
Sponsored by: *National Science Foundation*

S11: Allometry, Scaling and Ontogeny of Form
Sponsors: *DEDB, DIZ*
Sponsored by: *Company of Biologists, National Science Foundation*

S12: The Path Less Traveled: Reciprocal Illumination of Gecko Adhesion by Unifying Material Science, Biomechanics, Ecology, and Evolution
Sponsors: *DCB, DEE, DVM*
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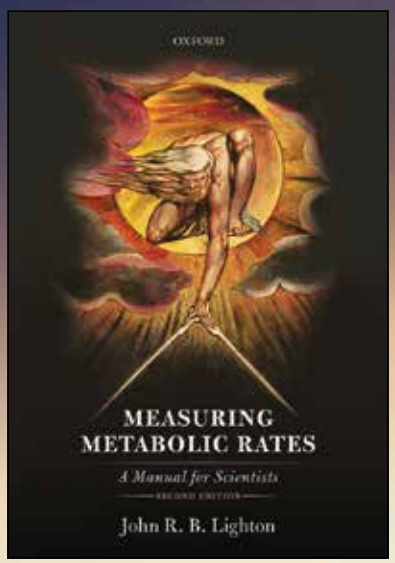
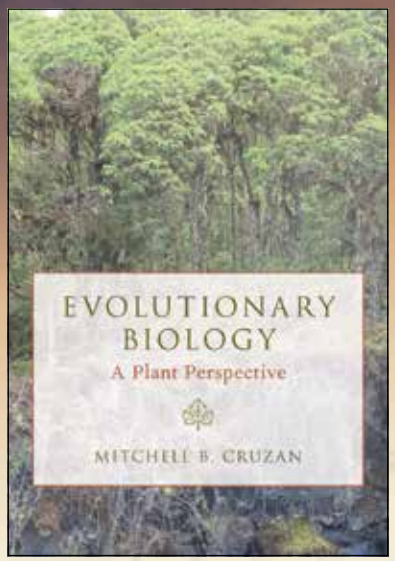


9780198830399 | ~~$80~~ **$56**



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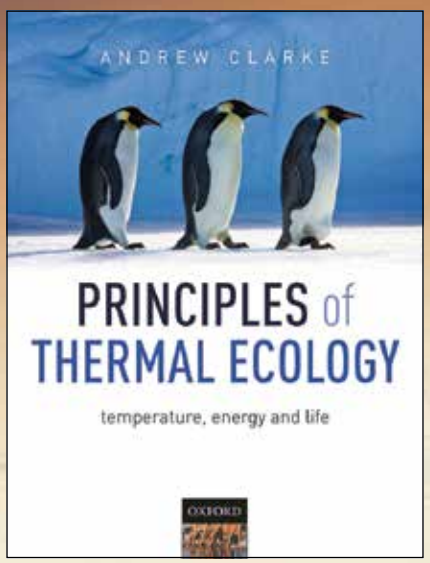

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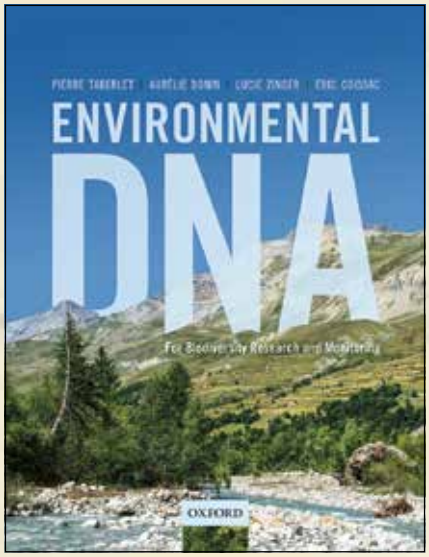

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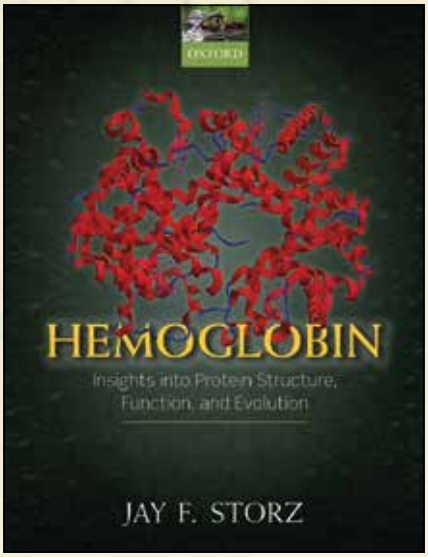

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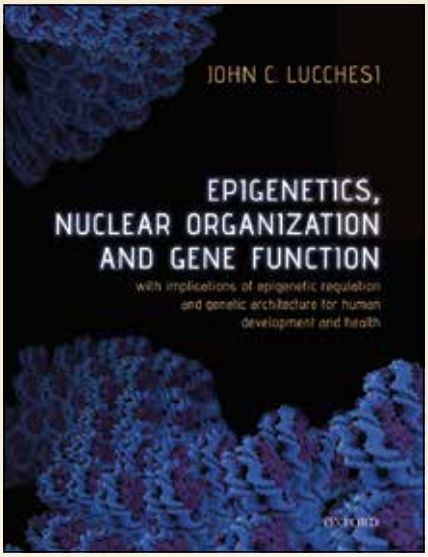

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Workshops and Programs

Thursday 3 January

Best practices for using NGS-based datasets to determine statistically robust evidence of positive selection and convergent evolution of polar organisms

9:00 AM – 5:00 PM, Room 1, Marriott

This workshop will use cross-disciplinary approaches for determining genetic adaptations in polar organisms using Next Generation Sequencing-based datasets. In particular, this workshop will focus on the following:

1) Establishing collaborative research groups to test for genes under positive selection from diverse polar organisms using genomic and transcriptomic datasets.
2) Evaluating current analytical methods for determining positively selected genes and their statistical significance.
3) Exploring current and novel methodologies for detecting genetic modifications acquired through convergent evolution in response to similar environmental conditions.
4) Reviewing lab-based protocols for demonstrating the potential functions of candidate genes.

Principles and analysis of small, high acceleration systems in biology and synthetic systems

1:00 PM – 5:00 PM, Room 19

This workshop is affiliated with the symposium "Playing with Power: Mechanisms of Energy Flow in Organismal Movement." Small, high acceleration systems that can be used repeatedly and repeatably are iconic in biology and still largely out of reach in synthetic systems. This workshop will bring together multidisciplinary, multi-stage researchers to learn, debate and plan a visionary and coherent approach to studying these systems. We will examine the conceptual foundation of small, fast movement and probe the current technical barriers to key measurements and analyses.

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

5:30 PM – 6:30 PM, Ballroom B

**Required for students with Charlotte Mangum support*

Friday 4 January

Student Postdoctoral Affairs Brown Bag Workshop: "Poster power-up!"

12:00 PM – 1:30 PM, Room 20

Public Affairs Committee Workshop: The art of persuasive communication: when acting meets science

12:00 PM – 1:30 PM, Room 5-6

Professionals at top of their fields are not simply subject matter experts, they are also highly skilled communicators who persuasively message quickly and easily while forging meaningful connections. VanCort Consulting's interactive talk, The art of persuasive communication: when acting meets science, utilizes macro performative public speaking tools to impart persuasive micro-communication tools. The talk empowers professionals present and converse compellingly, merging high impact voice and body work with an overview of current research. In short, it utilizes artistic and scientific interdisciplinary approaches needed for effective communication training. VCC's innovative interactive approach includes limited, fun, hands-on participation by audience volunteers. Those attending become better public speakers, optimizing their collaboration skills and leadership potential, ultimately enhancing career and organizational success.

Continued

Saturday 5 January

500 Women Scientists Meetup

12:00 PM – 1:30 PM, Room 3-4

A discussion about making science open, inclusive, and accessible. All are welcome to attend.

"Mastering Materials Imaging: Pushing boundaries in SEM and x-ray tomography"

12:00 PM – 1:30 PM, Room 16-17

This workshop is affiliated with the symposium "Adaptation and Evolution of Biological Materials." SEM and x-ray tomography are two widely used techniques for biological research that originated in the field of materials science. This workshop encourages participants to push the boundaries of how they interact with these methods, making the most of these tools for answering integrated materials and biological research questions. The goals of this workshop are to (1) encourage researchers with an interest in biomechanics and biomaterials systems to use SEM and x-ray tomography (i.e., microCT and related techniques) as part of their studies, by (2) demonstrating how SEM settings and fine art techniques can be combined to reliably produce high quality images for both publication and broader science communication, and (3) introducing how the limits of "traditional" x-ray imaging can be pushed with additional tools and computational algorithms to enable quantitative material and mechanical analysis, such as in-situ loading of micro and macro structure.

This workshop will consist of two 30-minute talks, listed below, with hands-on components followed by 30min of discussion and/or additional practice and trouble-shooting. Any hands-on components will be laptop-based (BYO laptop).

1) Dr. James Weaver (Harvard University, USA): Optimizing SEM image quality for use in both research publications and everyday science communication

2) Dr. Ling Li (Virginia Tech, USA): Pushing boundaries on microCT with modified image processing methods for in-situ mechanical loading at micro and macro scales.

Sketchnotes: A hands-on visual note-taking workshop

12:00 PM – 1:30 PM, Room 5-6

Sketchnoting, also known as visual note taking, is the practice of sketching or doodling notes while listening to a lecture with the purpose of summarizing or recording key concepts visually. Visual note taking is not detailed scientific illustration! The process of listening, identifying key points, and quickly translating them into a visual story on paper 1) increases focus during presentations, 2) helps in the retention and recollection of key concepts and complex scientific ideas, 3) creates a visual dialogue to communicate and share what was learned with the broader community, and 4) is fun! This is an introductory level workshop where you will learn about the power of visuals for learning and communication, practice simple sketching techniques, explore how fonts, colors, design and layout can help get your message across effectively, and how to overcome the challenges of time and complex material. We will also talk about different ways to sketch (from pens and watercolors to digital) and tips for building your sketching tool-kit. This hands-on workshop will include time to practice new techniques and a chance to create your first sketchnote! Supported by the Public Affairs Committee.

Intended Audience:
This workshop is intended for graduate students, postdocs, and research faculty who have an interest in visually capturing challenging concepts and key points quickly during lectures or conference talks. No artistic skills necessary, just the desire to visually communicate more efficiently and effectively!

Presenter:
Shayle Matsuda is a science communicator and PhD student at the Hawai'i Institute of Marine Biology and the University of Hawai'i at Mānoa. He has been watercolor sketchnoting for three years (you can check out his past three years of SICB conference notes on Twitter @wrong_whale). He is a science storyteller (WIRED.com, Story Collider, Nerd Nite), event host (Science, Neat, ChemLab: Chemistry lessons behind the bar), and part of the ComSciCon organizing committee (the National Communicating Science Workshop for STEM graduate students).

What you'll learn:
- Conquer your fear of drawing!
- Turn complex concepts into visual stories quickly
- Tricks for visual storytelling
- Create a visually engaging page
- The power of fonts and colors for emphasis
- Build your sketchnotes toolkit
- Practice live sketchnoting

Public Affairs Committee Workshop: The art of persuasive communication: when acting meets science

12:00 PM – 1:30 PM, Room 13

Professionals at top of their fields are not simply subject matter experts, they are also highly skilled communicators who persuasively message quickly and easily while forging meaningful connections. VanCort Consulting's interactive talk, The art of persuasive communication: when acting meets science, utilizes macro performative public speaking tools to impart persuasive micro-communication tools. The talk empowers professionals present and converse compellingly, merging high impact voice and body work with an overview of current research. In short, it utilizes artistic and scientific interdisciplinary approaches needed for effective communication training. VCC's innovative interactive approach includes limited, fun, hands-on participation by audience volunteers. Those attending become better public speakers, optimizing their collaboration skills and leadership potential, ultimately enhancing career and organizational success.

AMIRA/Avizo Workshop: Digital volume correlation for volumetric characterization of biomechanical changes

3:30 PM – 4:30 PM, Room 16-17

Biology isn't static, so your tomography data shouldn't be either! Push your 3D data to 4D: attend the Thermo Scientific workshop on Digital Volume Correlation (DVC) to learn how to visualize strains in your CT scans in Amira/Avizo software.

Continued

Sunday 6 January

Broadening Participation Committee Workshop: Creating a comfortable and welcoming learning community: from a strategic syllabus to realized student engagement

12:00 PM – 1:30 PM, Room 5-6

Diversity initiatives and inclusive teaching strategies often focus on the most apparent "others" in the classroom: racially, ethnically, or otherwise physically distinct cues to identify individuals. This raises two issues: first, inclusive teaching strategies could inadvertently draw unwanted attention to an individual or even make them feel the pressure of being an unwilling representative for their minority group. Second, many other cultural, religious, and socioeconomic perspectives that do not have physical cues are present in the room and may be ignored. While it may not be possible for an instructor to truly know every different perspective in their classroom, it is critical to be open to the perspectives of their students and to intentionally cultivate a classroom environment that is welcoming for all of them. Focusing specifically on student engagement styles on the introvert-extravert continuum, we'll outline strategies and work through classroom activities to create a learning environment that is conducive for all students to express themselves. We will also discuss the unique challenges of being a minority instructor teaching a predominantly majority group classroom, and vice-versa. While race isn't the only perspective to consider, it is certainly still a critical one.

Student Support Committee Brown Bag Workshop for Graduate Students: Writing a competitive GIAR/ FGST grant proposal

12:00 PM – 1:30 PM, Room 14-15

An interactive forum for graduate students to learn more about how to generate a competitive grant proposal for SICB's GIAR/FGST mechanisms of support (with broad application to any grant proposal that students might want to submit!) The workshop will include a brief information session with the nuts and bolts of the application and review process followed by an opportunity to interact with members of the Student Support Committee and previous GIAR/ FGST grant recipients Join us and we'll do our best to answer any questions that you might have!

TAL-X Workshop: Identifying the core concepts of vertebrate morphology teaching: a means to enhance active learning and retention in the classroom

7:00 PM – 9:00 PM, Room 5-6

This year's Teaching and Learning Workshop will be an interactive workshop on the teaching of comparative vertebrate anatomy and vertebrate morphology, organized by Drs. Nicole Danos, Katie Staab, and Lisa Whitenack. The workshop will be a two-hour round table format with drinks and desserts. Participants will have the opportunity to learn and engage with how to integrate other fields of inquiry and technology into anatomy courses, diverse & includive pedagogy, and core concepts in vertebrate morphology.

Description: The fields of vertebrate morphology and the scholarship of teaching and learning (SoTL) have grown by leaps and bounds in the last years and we are all more aware of the impact our pedagogical strategies can have on student success and retention. Although there are entire journals dedicated to the teaching of medical anatomy, the pedagogical literature on teaching comparative vertebrate anatomy is lacking. This has created a situation where new instructors are lacking research into best practices and core concepts to teach, and instructors who wish to implement active learning and inquiry-based pedagogies are starting from scratch. We envision a workshop wherein we will identify the core concept of teaching vertebrate comparative morphology, similar to what has been published for physiology (Michael et al. 2017). This will serve as a focus point around which we can push the boundaries of current teaching practices by sharing evidence-based strategies for teaching and learning, while also improving

our strategies for increasing the diversity of future vertebrate morphologists. We have gathered a group of teaching experts who will share their strategies for teaching comparative anatomy. We also will have an interactive poster at one of the poster sessions as a place to gather ideas for core concepts in comparative vertebrate anatomy from the SICB community.

Examples of topics:
Katie Staab (McDaniel College): Specimen preparation projects exhibited as art: engaging undergraduates and the general public in vertebrate morphology

Nicole Danos (University of San Diego). Using peer-to-peer and technology in the Vertebrate Comparative Anatomy classroom.

Christopher Kenaley (Boston College). Course based Undergraduate Research Experiences (CURES) to increase student engagement and retention.

Nick Gidmark (Knox College). Build your body (no, seriously, actually make it): integrating 2D and 3D maker-culture into Physiology, Fish Biology, and Comparative Anatomy courses.

Tobias Landberg (Arcadia University). Engaging students using social media

Monday 7 January

Evolutionary Biomechanics Mentoring and Networking Luncheon

12:00 PM – 1:30 PM, Room 1

This event is affiliated with the symposium "Comparative Evolutionary Morphology and Biomechanics in the Era of Big Data." The goal of this luncheon is to connect junior scientists with emerging leaders in the field of evolutionary biomechanics. Students and postdocs will be paired with one or more symposium speakers, including senior scientists, to discuss research and to help plan their next career steps. We hope to spark many new connections that will help catalyze research in the emerging integrative discipline of evolutionary biomechanics.

Tuesday 8 January

Particle image velocimetry for experimental biology: principles, implementation, and a hands-on session

8:00 AM – 6:00 PM, Meeting Room 5-6, Marriott

Particle Image Velocimetry (PIV) is a visualization technique used to measure fluid flows. Despite the usefulness of PIV for understanding the interaction between animals and the flow around them, the application of PIV in experimental biology is limited. This workshop is aimed at biologists who are interested in integrating PIV in their research, or are interested in better understanding the principles and implementation of the method. The workshop will cover PIV fundamentals such as system setup, image acquisition, analysis and post-procession. it will also include a hands-on session with PIV systems and MATPIV (BYO laptop). The workshop will be led by Roi Gurka (Costal Carolina University), Roi Holzman (Tel Aviv University), and Brooke Flammang (New Jersey Institute of Technology/Rutgers University). *Sponsored by TSI*.

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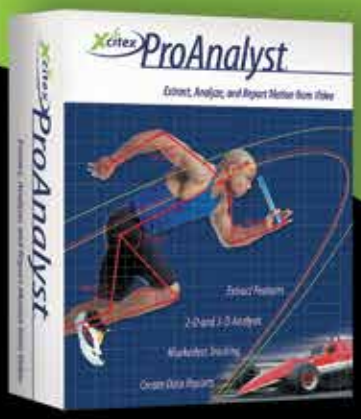

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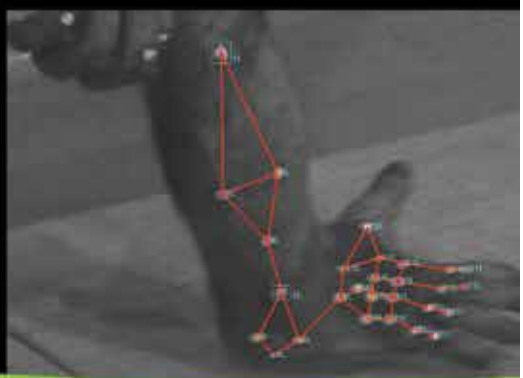

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General Information

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 11, 1st Level**, in the Tampa Convention Center, 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:

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

Registration

The SICB Registration/Information area is located in the Central Exhibit Hall at the Tampa Convention Center. The Registration Desk will be open during the following hours:

Thursday 3 January	3:00 PM – 8:00 PM
Friday 4 January	7:00 AM – 5:00 PM
Saturday 5 January	7:30 AM – 4:00 PM
Sunday 6 January	7:30 AM – 3:00 PM
Monday 7 January	7:30 AM – 2:30 PM

SICB App

Be sure to download the SICB 2019 Meeting App! You can find it in the app store. To get started click New User and login with your registration email address and a temporary password will be sent to you at that email. Then login using the temporary password and reset your password. If you need help, check with the registration desk. All meeting updates and the most current information will be pushed through to the App.

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 Central Exhibit Hall at the Tampa Convention Center.

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 Room 9 at the Tampa Convention Center. Pre-registration is required.

Mother's Room

SICB recognizes that balancing a family and meeting attendance creates unique challenges for parents. This year there is a Mother's room on the first floor of the Convention Center in Room 10, 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 and pump parts, and a sink with ample counter space.

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...Or

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Available on the App Store

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Search: SICB 2019

2019 SICB Exhibitor Floorplan

SICB Storybooth

Sublime is that which inspires feelings of admiration and awe. When did you last have a sublime science moment? SICB wants to share a story about when you were wowed by science!

Throughout the meeting, the SICB storybooth will be available in the Exhibit Area. Meeting participants will be able to stop by any time to record a 2-min story about their experience in science. The stories will be curated by the Public Affairs Committee (PAC). The top 8 will have their stories will be posted on the SICB website, Facebook, and Twitter website.

First place winner will receive $100, second place $50, and third place a free SICB tee! If you have questions, please contact the PAC chair, Thom Sanger at chair.pac@sicb.org. Don't forget to tweet about it!

#SICB2019 #wowsci

Exhibit Hours

Friday 4 January
9:30 AM – 5:30 PM

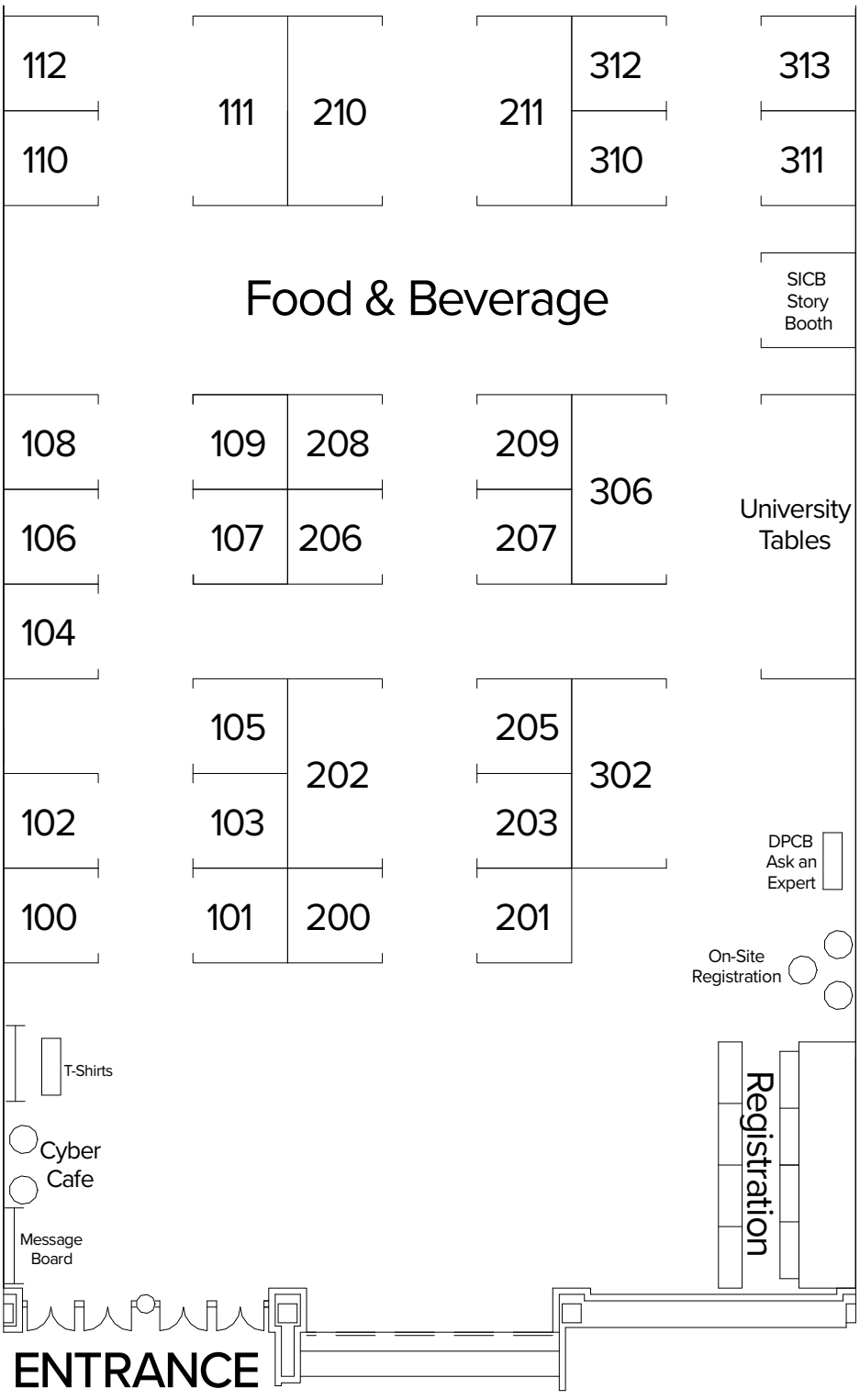
Saturday 5 January
9:30 AM – 5:30 PM

Sunday 6 January
9:30 AM – 5:30 PM

Coffee Breaks

Morning
9:30 AM – 10:30 AM

Evening
3:30 PM – 4:30 PM



Central Exhibit Hall
Tampa Convention Center

2019 SICB Exhibitors

The SICB Storybooth

Got any good stories about science? SICB wants to hear them! Throughout the meeting, the SICB storybooth will be available in the Exhibit Area. Meeting participants will be able to stop by any time to record a 2-min story about their experience in science. The stories will be curated by the Public Affairs Committee (PAC). The top 8 will have their stories will be posted on the SICB website, Facebook, and Twitter website.

AEI Technologies — Booth: 105

410 Technology Drive
Bastrop, TX 78602
800-860-5930
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: 108

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: 110

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.

Aurora Scientific Inc. — Booth: 312

Silver Sponsor

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The Biological Bulletin — Booth: 109

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: 313

Bidder Building, Station Road
Histon, Cambridge CB24 9LF UK
44 (0)1223 632878
www.biologists.com

The Company of Biologists is a not for profit publishing organisation dedicated to supporting and inspiring the biological community. The Company publishes five specialist peer-reviewed journals: Development, Journal of Cell Science, Journal of Experimental Biology, Disease Models & Mechanisms and Biology Open. It offers further support to the biological community by facilitating scientific meetings and communities, providing travel grants for researchers and supporting research societies.

The Crustacean Society — Booth: 205

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.

eLife Sciences Publications, Ltd — Booth: 106

Westbrook Centre, Milton Road
Cambridge, CB4 1YG UK
44 1223 855340
elifesciences.org

eLife is a non-profit organisation inspired by research funders and led by scientists. Our mission is to help scientists accelerate discovery by operating a platform for research communication that encourages and recognises the most responsible behaviours in science.

Expert Digital Imaging — Booth: 209

154 Humphrey Street, Suite 4
Swampscott, MA 01907
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, Optronis, IOI, and Edgertronic camera lines. At EDI, we offer traditional high-speed camera systems as well as long-recording high speed systems with associated automatic image tracking software.

Fastec Imaging — Booth: 200

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

Fastec Imaging builds high speed digital video cameras in standalone and computer tethered configurations for lab and field research. The 5 Megapixel TS5 and IL5 set the standard in price performance for cameras that record 1.2 Megapixel images at 1,000 fps or full HD images at over 630 fps.

Florida Institute of Oceanography (FIO) — Booth: 103

830 1st Street South
St. Petersburg, FL 33701
727-553-1100
fio.usf.edu

The Florida Institute of Oceanography (FIO) facilitates education and research in the marine and coastal environments. FIO operates two large research vessels-the R/V Weatherbird II (115') and the R/V W.T. Hogarth (78'), a fleet of smaller boats and a full service field laboratory in the Florida Keys- Keys Marine Laboratory (KML).

UW Friday Harbor Laboratories — Booth: 206

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.

Gene Tools, LLC — Booth: 201

1001 Summerton Way
Philomath, OR 97370
541-929-7840
www.gene-tools.com

Gene Tools manufactures Morpholino oligos for blocking translation, modifying splicing or inhibiting miRNA activity. Morpholinos are used in cell cultures, embryos or, as Vivo-Morpholinos, in adult animals. Morpholinos are effective, specific, stable and non-toxic. Backed by Ph.D.-level customer support, Gene Tools designs and synthesizes Morpholinos and offers cytosolic delivery options.

IO Industries Inc. — Booth: 207

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: 101

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: 310

111 Research Drive
Bethlehem, PA 18015
610-758-3680

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 www.lehigh.edu/~inbios/Grad/Grad_General.html for more information.

Loligo® Systems — Booth: 208

Toldboden 3, 2nd floor
Viborg, 8800 Denmark
+45 3360 2545
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: 102

1550 Pond Rd., Suite 110
Allentown, PA 18104
610-366-7103
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: 302

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.

SICB Journals

Stop by Booth #202 to find out more information about SICB's longstanding journal, *Integrative and Comparative Biology,* and our new journal, *Integrative Organismal Biology*, to be published this spring!

Oxford University Press — Booth: 210

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.

Qubit Systems Inc. — Booth: 100

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Booth: 104

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Booth: 107

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TSI, Incorporated

Booth: 203

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Xcitex Inc.

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University Tables

University of Mississippi Department of Biology

214 Shoemaker Hall
University, MS 38677
662-915-7203
biology.olemiss.edu

The Biology Department at the University of Mississippi is a comprehensive life science department. Our research encompasses cell and molecular biology, physiology, evolution, and ecology, with many areas of interdisciplinary strength including in species interactions, restoration and conservation biology, behavior and neurobiology, biodiversity, and freshwater/wetlands ecology.

New Mexico State University Department of Biology

Box 30001, MSC 3AF
Las Cruces, NM 88003
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.

North Dakota State University Department of Biological Sciences

201 Stevens Hall
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Fargo, ND 58108
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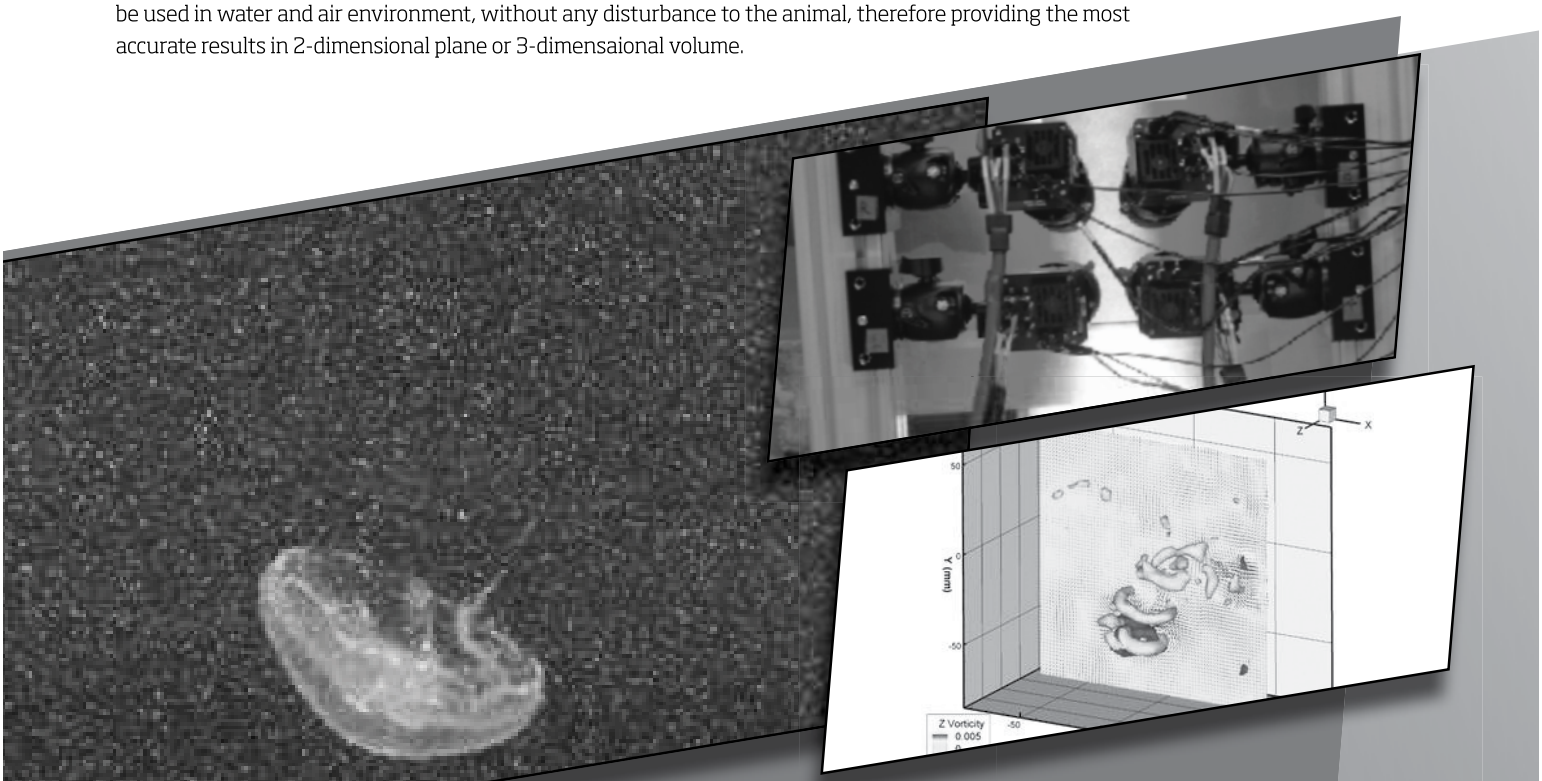

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UNDERSTANDING, ACCELERATED

Thursday Schedule of Events

Events take place in the Tampa Convention Center, unless otherwise noted

EVENT	TIME	LOCATION
Speaker Ready Room	12:00 PM – 7:00 PM	Room 11
Exhibitor Set-Up	1:00 PM – 6:00 PM	Exhibit Hall
Registration	3:00 PM – 8:00 PM	Central Exhibit Hall
SPECIAL LECTURE		
Plenary Session: Dr. Peter Wainwright Key Innovation and Diversity in Fish Jaws: A SICB Story	7:30 PM – 8:30 PM	Ballroom B
COMMITTEE AND BOARD MEETINGS		
SICB Executive Committee Meeting	2:30 PM – 5:30 PM	Room 18
Student Support Committee	5:30 PM – 7:00 PM	Room 8
WORKSHOPS AND PROGRAMS		
Workshop: Best practices for using NGS-based datasets to determine statistically robust evidence of positive selection and convergent evolution of polar organisms	9:00 AM – 5:00 PM	Room 1, Marriott
Workshop: Principles and analysis of small, high acceleration systems in biology and synthetic systems	1:00 PM – 5:00 PM	Room 19
RCN Steering Committee Grand Challenge: OSyM: Organismal Systems-level Modeling network	2:00 PM – 5:00 PM	Florida 1, Marriott
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	Ballroom B
SOCIAL EVENT		
Broadening Participation Meet & Greet	6:30 PM – 7:30 PM	Florida 2, Marriott
SICB Welcome Reception	8:30 PM – 10:00 PM	Ballroom A

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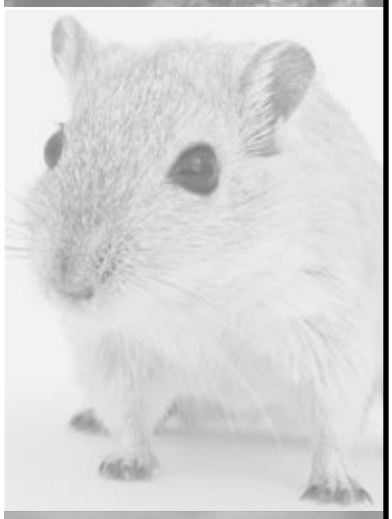

Arbor Assays, the first US Employee-Owned life sciences company, specializing in the development of highly sensitive detection, activity, and immunoassay kits, high-purity inhibitors, and antibodies for drug discovery and basic research. Our mission is to build the highest quality and robust detection and immunoassay products for clinically important biomolecules.

EXAMPLES OF NOTEWORTHY KITS

Corticosterone EIA (K014-H)

- Sensitivity: 18.6 pg/mL
- Small sample size, as little as 1 µL plasma

Testosterone EIA (K032-H)

- Sensitivity: 9.9 pg/mL
- Samples types include urine & fecal extracts

20-Hydroxyecdysone EIA (K066-H)

- Sensitivity: 198 pg/mL
- Specific to 20-E, low cross-reactivity to other steroids

Friday Schedule of Events

Events take place in the Tampa Convention Center, unless otherwise noted

EVENT	TIME	LOCATION
Registration	7:00 AM – 5:00 PM	Central Exhibit Hall
Speaker Ready Room	7:00 AM – 5:00 PM	Room 11
Poster Session 1 Set Up	7:00 AM – 8:00 AM	Exhibit Hall
Coffee Break AM	9:30 AM – 10:30 AM	Exhibit Hall
Exhibit Hall	9:30 AM – 5:30 PM	Exhibit Hall
Coffee Break PM	3:30 PM – 4:30 PM	Exhibit Hall
Poster Session 1 Even Numbers Authors Present	3:30 PM – 4:30 PM	Exhibit Hall
Poster Session 1 Odd Numbers Authors Present	4:30 PM – 5:30 PM	Exhibit Hall
Poster Session 1 Teardown	5:30 PM – 6:00 PM	Exhibit Hall
SPECIAL LECTURE		
Bartholomew Lecture: Dr. Ben Dantzer Plasticity, Hormones, Behavior, and Fitness: Understanding the Long-Reach of the Mother in Wild Animals *Sponsored by Sable Systems*	7:00 PM – 8:00 PM	Room 14-17
SYMPOSIA ORAL PRESENTATIONS		
S1: Integrative Plant Biology Chairs: Matt Ogburn, Erika Edwards	7:45 AM – 3:30 PM	Room 18
S2: The Scale of Sickness: How Immune Variation Across Space and Species Affects Infectious Disease Dynamics Chairs: Daniel Becker, Cynthia Downs, Lynn Martin	7:45 AM – 4:00 PM	Room 19
S3: Playing with Power: Mechanisms of Energy Flow in Organismal Movement Chairs: Jeffrey Olberding, Michael Rosario, Stephen Deban	8:00 AM – 3:30 PM	Room 14 & 15
CONTRIBUTED PAPER ORAL PRESENTATIONS		
MORNING		
Session 1: Acoustic Communication	8:00 AM – 9:30 AM	Room 1 & 2
Session 2: DEE Best Student Paper: Huey Award	8:00 AM – 9:45 AM	Room 3 & 4
Session 3: Host Parasite Relationships	8:00 AM – 10:00 AM	Room 5 & 6
Session 4: Where's My Partner? Coral Reef Biology	8:00 AM – 9:45 AM	Room 13
Session 5: Parasites Competition and Epigenetics	8:00 AM – 9:30 AM	Room 16 & 17
Session 6: Wright Had it Right - Population Genetics	8:00 AM – 9:15 AM	Room 20
Session 7: Inspired by Nature	8:00 AM – 9:30 AM	Room 21
Session 8: Ontogeny and Scaling	8:00 AM – 9:30 AM	Room 22
Session 9: Broken Shells and Cooked Muscles	8:00 AM – 9:15 AM	Room 23
Session 10: Sensorimotor	8:00 AM – 9:45 AM	Room 24
Session 11: Complementary to S8: Multifunctional Structures and Multistructural Functions: Functional Coupling and Integration in the Evolution of Biomechanical Systems	8:00 AM – 9:45 AM	Room 25
Session 12: Energetics of Endotherms: Diel and Short-Term Patterns	8:00 AM – 9:45 AM	Room 12
Session 13: DNNSB Best Student Paper	10:15 AM – 12:00 PM	Room 1 & 2
Session 14: Parental Behavior	10:00 AM – 11:30 AM	Room 3 & 4
Session 15: Breaking Bleachin - Coral Reef Biology	10:15 AM – 11:45 AM	Room 5 & 6
Session 16: Development and Behavior	10:30 AM – 12:00 PM	Room 13
Session 17: DVM Best Student Paper: D. Dwight Davis Award	10:00 AM – 12:00 PM	Room 16 & 17
Session 18: DPCB Best Student Paper: Wake Award	10:00 AM – 11:30 AM	Room 20
Session 19: Visual Signals	10:30 AM – 12:15 PM	Room 21
Session 20: Education: Creative Programs & Practices	10:00 AM – 11:45 AM	Room 22

Session 21: Thermal Tolerance and Fluctuating Thermal Environments	10:00 AM – 11:45 AM	Room 23
Session 22: DCE Best Student Paper: Aubrey Gorman Award	10:15 AM – 12:00 PM	Room 24
Session 23: Invertebrate Evo-Devo	10:15 AM – 12:00 PM	Room 25
Session 24: Cell & Molecular Physiology	10:00 AM – 11:30 AM	Room 12
AFTERNOON		
Session 25: DAB Best Student Paper: Marlene Zuk Award	1:30 PM – 3:15 PM	Room 1 & 2
Session 26: Let's get Physical-Biophysical Ecology	1:30 PM – 3:30 PM	Room 3 & 4
Session 27: DEDE Best Student Presentations	1:30 PM – 3:15 PM	Room 5 & 6
Session 28: Partners for Life-Symbiosis	1:30 PM – 3:15 PM	Room 13
Session 29: Groovin' as a Groupie-Population Ecology	1:30 PM – 3:30 PM	Room 16 & 17
Session 30: Molecular Evolution	1:30 PM – 3:30 PM	Room 20
Session 31: Stuck on You	1:30 PM – 3:30 PM	Room 21
Session 32: Stabby and Crunchy	1:30 PM – 3:30 PM	Room 22
Session 33: Evolutionary Morphology	1:30 PM – 3:15 PM	Room 23
Session 34: Going with the Unstable Flow	1:30 PM – 3:00 PM	Room 24
Session 35: Stress: It's a Mad Mad Mad Mad World	1:30 PM – 3:30 PM	Room 25
Session 36: Wintering/Overcooling	1:30 PM – 3:30 PM	Room 12

COMMITTEE AND BOARD MEETINGS

SICB Nominating Committee	7:00 AM – 8:00 AM	Room 34
Editorial Board Meeting: Evolution & Development	12:00 PM – 1:30 PM	Room 7
Division Chairs, President/President Elect	12:00 PM – 1:30 PM	Room 30 A/B
TCS Board Meeting	5:30 PM – 10:00 PM	Room 1, Marriott
AMS Executive Committee Meeting	8:00 PM – 10:30 PM	Room 8

BUSINESS MEETINGS

DAB Meeting	5:45 PM – 6:30 PM	Room 18
DNNSB Meeting	5:45 PM – 6:30 PM	Room 19
DCPB Meeting	5:45 PM – 6:30 PM	Room 20
DVM Meeting	5:45 PM – 6:30 PM	Room 21
DEE Meeting	5:45 PM – 6:30 PM	Room 22
DEDE Meeting	5:45 PM – 6:30 PM	Room 23
DEDB Meeting	5:45 PM – 6:30 PM	Room 24

WORKSHOPS AND PROGRAMS

Student Postdoctoral Affairs Brown Bag Workshop: "Poster power-up!"	12:00 PM – 1:30 PM	Room 20
Public Affairs Committee Workshop: The art of persuasive communication: when acting meets science	12:00 PM – 1:30 PM	Room 5-6
RCN Information Session / Brown Bag Lunch OSyM: Organismal Systems-level Modeling Network	12:00 PM – 1:30 PM	Room 8
DPCB Ask-An-Expert: Get phylogenetic and comparative methods support with an expert	3:30 PM – 5:30 PM	Central Exhibit Hall

SOCIAL EVENTS

DCPB Social and BART Reception	8:00 PM – 10:00 PM	The Landing, 2nd Floor

Friday Program Symposia

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

7:45 AM – 3:30 PM **Symposium S1** **Room 18**

Integrative Plant Biology

Chairs: Matt Ogburn, Erika Edwards

7:45 am	**S1-1**	*Edwards EJ, Ogburn MR; Yale University*	A Green Wave comes to SICB: two days of plant integrative and comparative biology
8:00 am	**S1-2**	*Ogburn RM, Edwards EJ, Donoghue MJ; Southern Utah University, Yale University*	Linking Plant Scaling Relationships and Ecology
8:30 am	**S1-3**	*Leslie AB, Losada JM; Brown University*	Functional Ontogeny and Morphological Evolution in Plant Reproductive Structures
9:00 am	**S1-4**	*Rosell JA; Univ Nacional Autónoma de México*	Understanding the Causes of Diversity of a Multifunctional Structure: the Case of Bark in Woody Plants
9:30 am	**S1-5**	*Olson ME; Univ Nacional Autónoma de México*	Plant Evolutionary Ecology in The Age of The Extended Evolutionary Synthesis
10:00 am		**Coffee Break**	**Exhibit Hall**
10:30 am	**S1-6**	*Li FW; Boyce Thompson Institute*	Diversity and genetics of plant-cyanobacteria symbioses
11:00 am	**S1-7**	*Muir CD; Univ of Hawaii, Manoa*	Synthesizing evolution and physiology using leaves, trees, and math
11:30 am	**S1-8**	*Peredo EL, Cardon ZG; Marine Biological Laboratory*	Calm vs. panicked: contrasting responses of desert-derived and aquatic green microalgae during desiccation and rehydration
12:00 pm		**Lunch Break**	
1:30 pm	**S1-9**	*Diggle P, Mulder C; University of Connecticut, University of Alaska*	Does Variation in Flower Development Explain Anomalous Phenological Responses to Temperature?
2:00 pm	**S1-10**	*Smith SD; University of Colorado-Boulder*	Evolutionary trajectories through color space: Hitting the hotspots and minding the gaps
2:30 pm	**S1-11**	*Emery NC, La Rosa RJ; University of Colorado Boulder*	Temporal Variation as a Driver of Species' Distribution Patterns
3:00 pm	**S1-12**	*Edwards EJ; Yale University*	The distinct evolutionary trajectories of C4 and CAM photosynthesis
3:30 pm		**Coffee Break**	**Exhibit Hall**

7:45 AM – 3:30 PM **Symposium S2** **Room 19**

The Scale of Sickness: How Immune Variation across Space and Species Affects Infectious Disease Dynamics

Chairs: Daniel Becker, Cynthia Downs, Lynn Martin

7:45 am	**S2-1**	*Becker DJ, Schoenle LA, Downs CJ, Martin LB; Montana State University, Hamilton College, University of South Florida*	The scale of sickness: how immune variation across space and species affects infectious disease dynamics
8:00 am	**S2-2**	*Field KA, Lilley TM, Ogata G, Rogers EJ, Prokkola JM, Moore MS, Reeder DM; Bucknell University*	The Challenges of Transcriptome-wide Comparisons Across Species and Genera
8:30 am	**S2-3**	*Ezenwa VO, Cyr JL, Gawriluk TR, Kimani JM, Kiama SG, Seifert AW; University of Georgia, University of Kentucky, University of Nairobi*	Trade-offs between immunity and life-history shape cryptic immunological variation in regeneration-competent rodents
9:00 am	**S2-4**	*Merrill L, Barger AM, Benson TJ; University of Illinois, Urbana-Champaign*	Landscape dynamics and immune function across a community of shrubland birds

9:30 am	**S2-5**	*Becker DJ, Argibay HG, Botto G, Escalera-Zamudio M, Greenwood AD, Rojas-Anaya E, Lavergne A, De Thoisy B, Czirják GÁ, Plowright RK, Altizer S, Streicker DG; Montana State University, Universidad de Buenos Aires, University of Oxford, Leibniz Institute for Zoo and Wildlife Research, Instituto Nacional de Investigaciones Forestales, Institut Pasteur de la Guyane, University of Georgia, University of Glasgow*	Quantifying and interpreting spatial autocorrelation in leukocyte profiles in a widespread Neotropical bat species
10:00 am		**Coffee Break**	**Exhibit Hall**
10:30 am	**S2-6**	*Rynkiewicz EC, Clerc M, Babayan S, Pedersen AB; Fashion Institute of Technology, Queens Medical Research Institute, University of Glasgow, University of Edinburgh*	Variation in Pro-Inflammatory Immune Responses Among- and Within-Individual Wild Wood Mice Impacts Parasite Infection Dynamics
11:00 am	**S2-7**	*Budischak SA, Graham AL, Cressler CE; Claremont McKenna, Pitzer, and Scripps Colleges, Princeton University, University of Nebraska, Lincoln*	Fueling Defense; Effects of Resources on the Evolution of Tolerance to Macroparasite Infection
11:30 am	**S2-8**	*Hall RJ; University of Georgia, Athens*	Modeling the Effects of Anthropogenic Stressors on Immune Defense and Infection Dynamics in Heterogeneous Host Populations
12:00 pm		**Lunch Break**	
1:30 pm	**S2-9**	*Civitello DJ, Malishev M; Emory University*	Scaling bioenergetic theory to predict the population dynamics of human schistosomes and intermediate snail hosts
2:00 pm	**S2-10**	*Adelman JS; Iowa State University*	Linking immunological mechanisms and transmission consequences of tolerance in a songbird host
2:30 pm	**S2-11**	*Pepin KM, Webb CT, Wilber MQ; National Wildlife Research Center, Colorado State University*	Scaling individual-level immunology to the population level provides risk assessment from convenience samples
3:00 pm	**S2-12**	*Stewart Merrill TE, Hall SR, Rapti Z, Cáceres CE; Univ of Illinois at Urbana-Champaign, Indiana University*	Variable Immunity and its Consequences for Disease
3:30 pm		**Coffee Break**	**Exhibit Hall**

8:00 AM – 3:30 PM **Symposium S3** **Room 14 & 15**

Playing with Power: Mechanisms of Energy Flow in Organismal Movement

Chairs: Jeffrey Olberding, Michael Rosario, Stephen Deban

8:00 am	**S3-1**	*Olberding JP, Azizi E, Deban SM, Rosario MV; Univ of California, Irvine, Univ of South Florida, West Chester Univ*	Energy flow in elastic structures: not so unusual
8:30 am	**S3-2**	*Roberts TJ; Brown University*	Some Challenges of Playing with Power
9:00 am	**S3-3**	*Edwards J; Williams College*	The Role of Water in Effecting Rapid Movements in Plants
9:30 am	**S3-4**	*Reynaga CM, Azizi E; Duke University, University of California, Irvine*	Trade-offs of power amplification on compliant substrates
10:00 am		**Coffee Break**	**Exhibit Hall**
10:30 am	**S3-5**	*Sawicki GS, Abbott E, Newzek T, Patek S, Wall C, Schmitt D; Georgia Institute of Technology*	Exploring the Limits of Muscle-based Latch Systems for Power Amplification
11:00 am	**S3-6**	*Richards CT, Eberhard EA, Collings AJ; The Royal Veterinary College, University of Portsmouth*	Energy flow across segments in multi-body systems: a case study in frogs
11:30 am	**S3-7**	*Patek SN; Duke University*	The power of extreme movement: evolution, behavior, and biomechanics of mantis shrimp strikes
12:00 pm		**Lunch Break**	
1:30 pm	**S3-8**	*Anderson PSL, Crofts SB; Univ of Illinois, Urbana-Champaign*	Making an impact: Energy transmission during high-speed puncture events

2:00 pm	**S3-9**	*Müller UK, Brown MD, Berg O; California State University Fresno*	Suction feeding without muscles: Estimating power requirements from flow for the traps of bladderwort, a carnivorous plant
2:30 pm	**S3-10**	*Sutton GP; University of Lincoln*	The two Borelli laws for jumping animals
3:00 pm	**S3-11**	*Longo SJ; Duke University*	Pivots and power amplification: evolution and functional morphology of feeding in seahorses and their relatives

3:30 pm ..... **Coffee Break** ..... **Exhibit Hall**

Friday Program Morning Sessions

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

8:00 AM – 9:30 AM **Session 1** **Room 1 & 2**

Acoustic Communication

Chair: Scott MacDougall-Shackleton

8:00 am	**1-1**	*Iwaniuk AN, O'Neil NP, Deaux E, Charrier I; Univ of Lethbridge, Univ Paris-Sud*	Individual and Seasonal Variation in the Courtship Display of Ruffed Grouse
8:15 am	**1-2**	*Ziadi P, Blakely B, Cerbone B, Anderson R; Florida Atlantic University*	Testing hypotheses about song type matching and song sequences in songbird vocal repertoires
8:30 am	**1-3**	*Smith-Vidaurre G, Araya-Salas M, Wright TF; New Mexico State University, Cornell University*	Monk parakeets exhibit strong individual signatures but weak acoustic convergence over higher social scales
8:45 am	**1-4**	*Duque FG, Rodriguez-Saltos CA, Monteros MF, Wilczynski W; Georgia State Univ, Emory Univ, Univ Tecnica del Norte*	Signal transmission of high-frequency vocalizations of Andean hummingbirds
9:00 am	**1-5**	*Dinh JP, Nowicki S, Peters S; Duke University*	Intra-diel improvement in song performance: swamp sparrows 'warm up' in the morning
9:15 am	**1-6**	*Garrod HM, Curry RL; Villanova University*	A tale of two todies: how vocal behavior influences mate choice in two tody species

9:30 am ..... **Coffee Break** ..... **Exhibit Hall**

8:00 AM – 9:45 AM **Session 2** **Room 3 & 4**

DEE Best Student Paper: Huey Award

Chair: Robert Cox

8:00 am	**2-1**	*Chung AK, Cox RM, Cox CL; Georgia Southern University, Univ of Virginia*	Ontogenetic increases in sex-biased gene expression vary across tissues in a sexually dimorphic lizard
8:15 am	**2-2**	*Curlis JD, Holmes IA, Davis Rabosky AR, Cox CL; Univ of Michigan, Georgia Southern Univ*	Evolutionary Linkage of Mimetic and Non-Mimetic Color Traits in a Coral Snake Mimicry Complex
8:30 am	**2-3**	*Ong J, Bonier F; Queen's University at Kingston*	Coping with thermal challenges: reaction norms of life history traits in a burying beetle with biparental care
8:45 am	**2-4**	*Gilbert AL, Miles DB; Ohio University*	Thermoregulatory Behavior and Thermal Physiology are Evolutionarily Uncoupled in Phrynosomatid Lizards
9:00 am	**2-5**	*Evans AE, Urban MC, Jockusch EL; University of Connecticut*	The Effect of Incubation Temperature on the Plasticity of Embryonic Development and Color Expression in *Plethodon cinereus*
9:15 am	**2-6**	*McCoy DE, Shultz AJ, Vidoudez C, Van Der Heide E, Trauger SA, Haig D; Harvard University*	The Corruption of Honest Signals: from Mate Choice in Red Birds to Human Pregnancy
9:30 am	**2-7**	*Kobiela ME, Snell-Rood EC; Univ of Minnesota*	Anthropogenic Increases in Sodium Alter Life History and Stress Tolerance in Monarch Butterflies

9:45 am ..... **Coffee Break** ..... **Exhibit Hall**

8:00 AM – 10:00 AM **Session 3** **Room 5 & 6**

Host Parasite Relationships

Chairs: Jeff Grim, Alyssa-Lios Gehman

8:00 am	**3-1**	*Johansen IB, Henriksen EH, Shaw JC, Mayer I, Amundsen PA, Øverli Ø; Norwegian University of Life Sciences, UiT The Arctic University of Norway*	Towards the parasites' perspective on host pigmentation
8:15 am	**3-2**	*Grim JM, Pawlan J, Bowen V, Brosnan EB, McMahon TA; University of Tampa*	Amphibian hosts experience decreased metabolic rates and diminished stress responses during the time course of chytridiomycosis
8:30 am	**3-3**	*Sckrabulis JP, Messner ML, McWhinnie RB, Ansari HD, Raffel TR; Oakland University*	Environmental Predictors of Avian Schistosome (Swimmer's Itch) Abundance Among Michigan Inland Lakes
8:45 am	**3-4**	*Knutie SA; University of Connecticut*	Effects of supplemental feeding on the gut microbiome and parasite resistance of Eastern Bluebirds
9:00 am	**3-5**	*Gehman ALM, Schaeffer O, Harley CDG; University of British Columbia*	Environmental drivers of host defense and the cost of parasitism
9:15 am	**3-6**	*Moore ME, Hill CA, Kingsolver JG; Univ of North Carolina, Chapel Hill*	Mutually Assured Destruction: Repeated Heat Stress Kills Parasitoid Eggs and Disrupts Host Development
9:30 am	**3-7**	*Nadler LE, Ellis HI, Nelson A, Turner AV, Williams CL, Øverli Ø, Hechinger RF; Norw. Univ Life Sci., Univ of San Diego, Univ of California, San Diego*	Are Parasites Always Detrimental? Costs of infection to final hosts that forage on prey modified by parasites
9:45 am	**3-8**	*Keiser CN, Saltz JB, Rudolf VHW; University of Florida, Rice University*	Behavioral trait variation mediates the relationship between genetic diversity and disease

10:00 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:45 AM **Session 4** **Room 13**

Where's My Partner? Coral Reef Biology

Chair: Rachel Wright

8:00 am	**4-1**	*Bove CB, Davies SW, Ries JB, Umbanhowar J, Castillo KD; University of North Carolina at Chapel Hill, Boston University, Northeastern University*	Ocean acidification and warming impact physiology of the algal symbiont to a greater extent than the host in four common Caribbean corals
8:15 am	**4-2**	*Colombara AM, Chadwick NE; Auburn University*	Impact of thermal stressors on growth and physiology of the tropical sea anemone *Bartholomea annulata*
8:30 am	**4-3**	*Noonan KR, Childress MJ; Clemson University*	Influence of physical structure and live coral cover on coral reef fish community composition and habitat associations in a rapidly changing reef environment
8:45 am	**4-4**	*Dixon G, Bay LK, Matz MV; University of Texas, Australian Institute of Marine Science*	Role of gene body methylation in coral acclimatization and adaptation
9:00 am	**4-5**	*Kriefall NG, Matz MV, Kanke M, Davies SW; Boston University, University of Texas at Austin, Cornell University*	Host and Symbiont Genetic Structure in the Coral *Acropora hyacinthus* Across Two Divergent Reef Zones
9:15 am	**4-6**	*Wright R, Nuttall M, Davies S; Harvard Medical School, Flower Garden Banks National Marine Sanctuary, Boston University*	Coral gene expression signatures of a mass die-off event in the Texas Flower Garden Banks
9:30 am	**4-7**	*MacKnight NJ, Dimos B, Lasseigne D, Muller E, Brandt M, Mydlarz L; The University of Texas at Arlington, The University of the Virgin Islands, Mote Marine Laboratory*	Caribbean Coral Species Differ in Susceptibility and Immune Response to White Plague Disease

9:45 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:30 AM **Session 5** **Room 16 & 17**

Parasites Competition and Epigenetics

Chairs: Marie-Claire Chelini, Tricia Rubi

8:00 am	**5-1**	*Chelini MC, Edwards DL; Univ of California, Merced*	Malaria as a Mediator of Sexual Dimorphism in Western Fence Lizards (*Sceloporus occidentalis*)

8:15 am	**5-2**	*Frye BM, Hankerson SJ, Tardif SD, Sears MW, Dietz JM; Clemson University, University of St. Thomas, St. Paul, Southwest National Primate Research Center, University of Maryland, College Park*	Siblings as an ecological constraint? Physical, reproductive, and survival consequences of sibling competition in a cooperatively breeding primate (*Leontopithecus rosalia*)
8:30 am	**5-3**	*Flores DV, Janzen FJ; Iowa State University*	Epigenetic variation in a reptile: implications for temperature-dependent sex determination
8:45 am	**5-4**	*Johnson KM, Casas SM, La Peyre JF, Kelly MW; Louisiana State University*	The Influences of Environment and Dermo Infection on DNA Methylation in the Eastern Oyster *Crassostrea virginica*
9:00 am	**5-5**	*Hanson HE, Kilvitis HJ, Schrey AW, Maddox JD, Martin LB; Univ of South Florida, Georgia Southern Armstrong Campus, Field Museum of Natural History*	Epigenetic Potential in Immune Genes of Introduced House Sparrows
9:15 am	**5-6**	*Rubi TL, Knowles LL, Dantzer B; University of Michigan*	Museum epigenomics: characterizing DNA methylation across a range expansion using natural history collections

9:30 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:15 AM **Session 6** **Room 20**

Wright Had it Right - Population Genetics

Chair: Chiara Papetti

8:00 am	**6-1**	*Lasala JA, Hughes C, Wyneken J; Florida Atlantic University*	Breeding sex ratios in a mainland population of Leatherback sea turtles
8:15 am	**6-2**	*McClain MA, Gallagher AJ, Hammerschlag N, Drymon JM, Grubbs RD, Smukall M, Guttridge TL, Daly-Engel TS; University of West Florida, University of Miami, Mississippi State University Extension, Florida State University, Bimini Biological Field Station, Florida Institute of Technology*	Connectivity and Relatedness in Tiger Sharks (*Galeocerdo cuvier*) between the Gulf of Mexico and West Atlantic
8:30 am	**6-3**	*Galaska MP, Liu G, Bracco A, Quattrini AM, Etnoyer PJ, Herrera S; Lehigh University, Georgia Institute of Technology, Harvey Mudd College, NOAA NCCOS*	Comparing patterns of connectivity for mesophotic and deep-sea corals in the Gulf of Mexico.
8:45 am	**6-6**	*Orton RO, Schield DR, Row KW, Nikolakis ZL, Perry BW, Demuth JP, Mackessy SP, Meik JM, Castoe TA; Univ of Texas, Arlington, Univ of Northern Colorado, Tarleton State University*	Variation in genetic diversity and differentiation across chromosomes in rattlesnakes reveal links between genome structure and speciation
9:00 am	**6-7**	*Schiavon L, Battistotti A, Marino IAM, Duliere V, Codogno G, Beoni S, Dal Borgo L, De Biasio L, Soave N, La Mesa M, Zane L, Papetti C*; University of Padova, Royal Belgian Institute of Natural Sciences, Istituto di Scienze Marine (ISMAR), Consiglio Nazionale delle Ricerche*	In Cold Blood: Speciation, Introgression and Hybridization in Antarctic Fish

9:15 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:30 AM **Session 7** **Room 21**

Inspired by Nature

Chairs: Hunter King, Shane Ross

8:00 am	**7-1**	*Ross SD, Nave GK, Somers K, Davis B, Gruszewski H, Hall N, Powers C, Schmale DG; Virginia Tech*	Aerial dispersal devices inspired by autorotating plant seeds
8:15 am	**7-2**	*Feng J, Shahrokhian A, King H*; University of Akron*	Aerodynamic role of bumps on fog baskers
8:30 am	**7-3**	*Rao C, Liu H; Chiba University*	Aeroacoustic Noise Suppression and Aerodynamic Robustness in Owl-inspired Leading-edge Serrations
8:45 am	**7-4**	*Stubbs AL; Univ of California, Berkeley*	Sound attributed to 'sonic attacks' on U.S. diplomats in Cuba spectrally matches echoing cricket
9:00 am	**7-5**	*Yang D, Rocho-Levine J, Moore M, Shorter K, Johnson M; University of Michigan, Dolphin Quest, Oahu, Woods Hole Oceanographic Institution, University of St, Andrews*	in-Vivo Measurements of Bottlenose Dolphin Skin Under Pressure Loading

9:15 am	**7-6**	*Chang E, Lentink D; Stanford University*	A Bio-hybrid Morphing Tail for Vertical Tailless Gliding Flight
9:30 am		**Coffee Break**	**Exhibit Hall**

8:00 AM – 9:30 AM **Session 8** **Room 22**

Ontogeny and Scaling

Chairs: Janne Pfeiffenberg, Alice Gibb

8:00 am	**8-1**	*Gibb AC, Minicozzi MR; Northern Arizona University*	Changes in body size affect the biomechanics and behavior of teleost fishes
8:15 am	**8-2**	*Li G, Liu H, Müller UK, Voesenek CJ, Van Leeuwen JL; Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Chiba University, California State University Fresno, Wageningen University*	Optimisation strategies and hydrodynamic constraints in undulatory swimming: lessons learned from larval fish
8:30 am	**8-3**	*Ford KL, Donatelli CM, Gibb AC, Albert JA, Summers AP; University of Louisiana at Lafayette, Tufts University, Northern Arizona University, University of Washington*	Scaling with Scales: Analysis of armor and swimming through ontogeny in the Bay Pipefish (*Syngnathus leptorhynchus*)
8:45 am	**8-4**	*Pfeiffenberger JA, Tytell ED; Tufts University*	Ontogenetic scaling of the viscoelastic mechanical properties of the body of the bluegill sunfish, *Lepomis macrochirus*
9:00 am	**8-5**	*Ingle DN, Porter ME; Florida Atlantic University*	Mechanical behavior of vertebral trabecular bone varies regionally and ontogenetically in the Florida manatee (*Trichechus manatus latirostris*)
9:15 am	**8-6**	*Woelfer J, Amson EA, Arnold P, Botton-Divet L, Fabre AC, Vanheteren AH, Nyakatura J; Humboldt-Universitaet zu Berlin, Museum fuer Naturkunde, Friedrich-Schiller-Universitaet, Muséum national d'Histoire naturelle, Zoologische Staatssammlung Muenchen*	Does scaling of morphology depend on locomotor ecology? The case of the sciuromorph rodent femur
9:30 am		**Coffee Break**	**Exhibit Hall**

8:00 AM – 9:15 AM **Session 9** **Room 23**

Broken Shells and Cooked Muscles

Chair: Anabela Maia

8:00 am	**9-1**	*Crane RL, Denny MW; Stanford University*	How bivalves fail: fatigue and fracture of California mussel shells
8:15 am	**9-2**	*Kruppert S, Taylor J; University of Washington, Scripps institution of oceanography*	Shells in a changing ocean: the impact of ocean acidification on mollusk vulnerability
8:30 am	**9-3**	*Reyes CL, Benson B, Levy M, Pires A, Pechenik JA, Davies SW; Boston University, Tufts University, Dickinson College*	Effects of ocean acidification on *Crepidula fornicata* physiology and gene expression across two life history stages
8:45 am	**9-4**	*Jahan I, Maia A*; Eastern Illinois University, Rhode Island College*	Temperature affects in vivo muscle mechanics in swimming Centrarchids
9:00 am	**9-5**	*Moran CJ, Jebb K, Young C, Gerry SP; The Citadel, Fairfield University*	The Effects of Torpor Inducing Temperatures on Temperature Fish Muscle
9:15 am		**Coffee Break**	**Exhibit Hall**

8:00 AM – 9:45 AM **Session 10** **Room 24**

Sensorimotor

Chairs: Amanda Powers, Aaron Olsen

8:00 am	**10-1**	*Thandiackal R, Melo K, Paez L, Kano T, Ishiguro A, Ijspeert AJ; Harvard University, École Polytechnique Fédérale de Lausanne, Tohoku University*	Undulatory swimming control with local exteroceptive sensory feedback
8:15 am	**10-2**	*Lunsford ET, Skandalis D, Liao JC; University of Florida*	Efferent Neurons have Binary Control over the Lateral Line during Swimming

8:30 am	**10-3**	*Powers AK, Berning DJ, Manning A, Nzobigeza N, Gross JB; Harvard Medical School, Univ of Cincinnati*	Sensing in the dark: asymmetrical skulls may help blind cavefish find their way
8:45 am	**10-4**	*Liao JC, Dave S, Adorisio M; University of Florida, National Center for Biological Sciences, SISSA*	Sensory Conflict for Fish Swimming in Flow; the Role of Vision in Station Holding
9:00 am	**10-5**	*Olsen AM, Hernández LP, Camp AL, Brainerd EL; Brown University, George Washington University, University of Liverpool*	Channel catfish use higher coordination to capture prey than to swallow
9:15 am	**10-6**	*Granatosky MC, Ross CF; Univ of Chicago*	Variation in Proprioceptive Sensory Systems across Tetrapods Demonstrate Performance Consequences During an Unexpected Fall
9:30 am	**10-7**	*Holowka NB, Wynands B, Drechsel T, Haile DW, Ojiambo R, Okutoyi P, Tobolsky VA, Yegian AK, Zippenfennig C, Milani TL, Lieberman DE; Harvard University, Technische Universität Chemnitz, Moi University*	Plantar Calluses Provide Protection Without Trading-Off the Sensitivity of Fast-Adapting Mechanoreceptors

9:45 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:45 AM **Session 11** **Room 25**

Complementary to S8: Multifunctional Structures and Multistructural Functions: Functional Coupling and Integration in the Evolution of Biomechanical Systems

Chairs: Nicholas Gidmark, Anthony Lapsansky

8:00 am	**11-1**	*Smith KAH, Lee ECS, Rainbow MJ; Queen's University*	The relationship between soft tissue function and morphology in the talus during dynamic in vivo activities
8:15 am	**11-2**	*Dias AS, Von Hagel AA, Summers AP, Gerringer ME, Farina SC; Whitman College, Univ of Washington, Friday Harbor, Howard Univ*	Evolution of bone density in deep-sea snailfishes
8:30 am	**11-3**	*Camp AL, University of Liverpool*	What fish can teach us about the feeding functions of postcranial muscles and joints
8:45 am	**11-4**	*Gidmark NJ, Berger G, Rahman N, Rosenbloom J; Knox College*	Evolution of body shape, jaw anatomy, and muscle physiology in Centrarchid fishes
9:00 am	**11-5**	*Krentzel D, Angielczyk K; Univ of Chicago, Field Museum*	Constraints or Functional Innovations? An Integrative and Comparative Approach to Understanding the Astounding Diversity of Rodent Feeding
9:15 am	**11-6**	*Lapsansky AB, Tobalske BW; University of Montana*	The Comparative Biomechanics of Aerial and Aquatic Flight in Alcids
9:30 am	**11-7**	*Wright MA, Pierce SE; Harvard University*	Functional Morphology of the Hip Joint during Mammalian Evolution

9:45 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:45 AM **Session 12** **Room 12**

Energetics of Endotherms: Diel and Short-Term Patterns

Chairs: Ken Welch, Jamie Dolan

8:00 am	**12-1**	*Shankar A, Hoyven Cisneros IN, Graham CH, Powers DR*; Stony Brook University, George Fox University, WSL*	Deep vs Shallow Torpor: Nocturnal Body Temperature Management in Hummingbirds
8:15 am	**12-2**	*Eberts ER, Dick MF, Welch KC; University of Toronto Scarborough*	No Midnight Snacks for Hummingbirds: Rapid Nighttime Expenditure of Crop-Stored Sugar in *Ruby-throated Hummingbirds*
8:30 am	**12-3**	*Dick MF, Welch KC; University of Toronto*	Dietary guild influences sugar oxidation in bats
8:45 am	**12-4**	*Dick MF, Alcantara-Tangonan A, Oghli YS, Welch KC*; University of Toronto Scarborough*	Now or Later: Differential fates for glucose and fructose in a nectarivore
9:00 am	**12-5**	*John JS, Boerner K, Denum L, Gaspard JC, Williams TM; University of California, Santa Cruz, Mote Marine Laboratory & Aquarium, Pittsburgh Zoo & PPG Aquarium*	Two stage recovery response in a shallow diving marine mammal; implications for boat avoidance cost in West Indian manatees

9:15 am	**12-6**	*Dolan JE, Hammond KA; UC Riverside*	Sustained Metabolic Rates of Wheel Running in High Altitude Deer Mice
9:30 am	**12-7**	*Kaiyala KJ, Lighton JRB*; Univ of Washington, Sable Systems International*	Full Derivation and Verification of a Simplified Technique for Accurate Measurement of Energy Expenditure
9:45 am		**Coffee Break**	**Exhibit Hall**

10:15 AM – 12:00 PM **Session 13** **Room 1 & 2**

DNNSB Best Student Paper

Chair: Mike Baltzley

10:15 am	**13-1**	*Mekdara PJ, Schwalbe MAB, Tytell ED; Tufts University, Lake Forest College*	Tail synchronization of schooling giant danios is altered after lateral line system ablation and regeneration
10:30 am	**13-2**	*Rauscher MJ, Bi CX, Fox JL; Case Western Reserve University*	Imposed Haltere Oscillations Influence Head and Wing Movements of Tethered Flying *Drosophila*
10:45 am	**13-3**	*Chai CM, Sternberg PW; California Institute of Technology*	Interneuron Control of *C. elegans* Diapause Entry
11:00 am	**13-4**	*Rimniceanu M, Sponberg S; Georgia Institute of Technology*	Moths are distractible fliers.
11:15 am	**13-5**	*Patel RN, Cronin TW; Univ of Maryland, Baltimore County*	Celestial and Idiothetic Compasses in a Path Integrating Mantis Shrimp
11:30 am	**13-7**	*Butler JM, Anselmo CM, Maruska KP; Louisiana State University*	Female Reproductive State is Associated with Changes in Distinct Arginine Vasotocin Cell Types in the Preoptic Area of *Astatotilapia burtoni*
11:45 am	**13-8**	*Andrade Lopez JM, Pani AM, Minor PJ, Lowe CJ; Stanford University, UNC*	Nervous system evolution: A molecular genetic characterization of neural cell types in *S. kowalevskii*
12:00 pm		**Lunch Break**	

10:00 AM – 11:30 AM **Session 14** **Room 3 & 4**

Parental Behavior

Chair: Kathleen Lynch

10:00 am	**14-1**	*Poorboy DM, Bowers EK, Sakaluk SK, Thompson CF, Bowden RM; Illinois State University, University of Memphis*	Experimental cross-fostering of eggs reveals effects of territory quality on reproductive allocation
10:15 am	**14-2**	*Goyes Vallejos J, Grafe TU, Wells KD; University of Connecticut, University of Kansas, Universiti Brunei Darussalam*	Don't Put All Your Tadpoles in One Basket — Parental Strategies in A Frog With Larval Transport
10:30 am	**14-3**	*Lynch KS, O'Connell L, Balakrishnan C, McKim Louder M, Fischer E; Hofstra University, Stanford University, East Carolina University*	Understanding the genetic and neural basis of avian brood parasitism
10:45 am	**14-4**	*Ryeland J, Spencer RJ, Umbers KDL, House CM; Western Sydney University*	Male-parental care adjustments with differing levels of paternity in a polyandrous bird
11:00 am	**14-5**	*Austin SH, Lang AS, MacManes M, Calisi RM; UC Davis, University of New Hampshire*	What to expect, when you're expecting to become parents? Genome to phenome changes in reproduction of rock doves (*Columba livia*)
11:15 am	**14-6**	*Rice MA, Galindez S, Ophir AG; Cornell University*	Female biased sex ratios lead to multi-male mating and mixed paternity in socially monogamous female prairie voles
11:30 am		**Lunch Break**	

10:15 AM – 11:45 AM **Session 15** **Room 5 & 6**

Breaking Bleachin - Coral Reef Biology

Chair: Shayle Matsuda

10:15 am	**15-1**	*Matsuda SB, Gates RD; Hawaii Institute of Marine Biology*	The effects of thermal stress on Symbiodiniaceae assemblages in four Hawaiian coral species

10:30 am	**15-2**	*Benson BE, Castillo KD, Baumann JH, Aichelman HE, Stanizzi DA, Davies SW; Boston University, University of North Carolina at Chapel Hill*	Increased Diel Thermal Variability Promotes Growth and Symbiosis in a Reef-Building Coral
10:45 am	**15-3**	*Williams SD, Patterson MR; Northeastern University*	Resistance and Robustness of the Global Coral-Symbiont Network
11:00 am	**15-4**	*Childress MJ, Smith KM, Noonan KR, Bertelsen RD; Clemson University, Florida Marine Research Institute - FWC*	Using Acoustic Telemetry to Study Behavior and Habitat Associations in Stoplight Parrotfish and Caribbean Spiny Lobsters
11:15 am	**15-5**	*Smith KM, Childress MJ; Clemson University*	Ecological Conditions Influencing the Resiliency of Coral Transplants in the Middle Florida Keys
11:30 am	**15-7**	*Matz MV, Dixon GB, Liao Y, Fuller ZL; University of Texas at Austin, Columbia University*	Rampant cryptic speciation and environmental specialization in two massive coral species from the Florida Keys.

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

10:30 AM – 12:00 PM **Session 16** **Room 13**

Development and Behavior

Chair: Erica Westerman

10:30 am	**16-1**	*Laskowski KL, Doran C, Bierbach D, Wolf M; Leibniz Institute of Freshwater Ecology & Inland Fisheries*	Tracking the Developmental Trajectories of Behavioral Individuality in a Clonal Fish
10:45 am	**16-2**	*Bowers JM, Amarie D, Sittaramane V; Georgia Southern University*	Using DanioVision as a Novel System to Study Learning in the Dwarf Cuttlefish, *Sepia bandensis*
11:00 am	**16-3**	*Westerman EL, Rather PA, Herzog AE, Ernst DA; University of Arkansas*	The effect of experience on mating behavior in Heliconius butterflies
11:15 am	**16-4**	*Chaby LE, Cavigelli SA, Chen CV, Liberzon I, Braithwaite VA; Wayne State University, Pennsylvania State University, Texas A&M*	Understanding Apparent Cognitive Enhancements Following Stress in Adolescence: Insights From a Rodent Model
11:30 am	**16-5**	*Belnap SC, Lickliter R; Florida International University, Miami*	Incubation Temperature Influences Fall Frequency in Bobwhite Quail Neonates
11:45 am	**16-6**	*Haney WA, Strother JA; Oregon State University*	Out of the dark and into the light: light preference behaviors in larval zebrafish.

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

10:00 AM – 12:00 PM **Session 17** **Room 16 & 17**

DVM Best Student Paper: D. Dwight Davis Award

Chair: John Hutchinson

10:00 am	**17-1**	*Bernstein JM, Crawford CH, Wainwright DK, Ruane S, Flammang BE; Rutgers University-Newark, New Jersey Institute of Technology, Harvard University*	Snake Scale Keels: A Three-dimensional Investigation of Function
10:15 am	**17-2**	*Luger AM, Dutel H, Fagan M, Herrel A, De Kegel B, Adriaens D; Ghent University, University of Hull, MNHN*	Understanding the role of the musculature in the prehensile tail of chameleons
10:30 am	**17-3**	*Mayerl CJ, Capano J, Moreno A, Blob RW, Brainerd EL, Wyneken J; Northeast Ohio Medical University, Brown University, Clemson University, Florida Atlantic University*	XROMM analyses of differences in pectoral and pelvic girdle rotation between land and water in turtles
10:45 am	**17-4**	*Wainwright DK, Collar DC, Gemmel BJ, Lauder GV; Harvard University, Christopher Newport University, University of South Florida*	Fish scales: Structure, diversity, and hydrodynamic function
11:00 am	**17-5**	*Rutledge KM, Summers AP, Kolmann MA; University of California Los Angeles, University of Washington, George Washington University*	Killing them softly: the structure and function of the jaws of a durophagous freshwater river ray (*Potamotrygon leopoldi*) through ontogeny
11:15 am	**17-6**	*Vaz DF, Hilton EJ; College of William and Mary*	Ontogeny of the Plainfin Midshipmen, *Porichthys notatus* (Batrachoididae: Batrachoidiformes)

11:30 am	**17-7**	*Rupp AE, Moon BR; University of Louisiana Lafayette*	Feeding Mechanisms and Digestive Anatomy of Mud Snakes, *Farancia abacura*
11:45 am	**17-8**	*Van Meer NMME, Weller HI, Manafzadeh AR, Kaczmarek EB, Scott B, Gussekloo SWS, Wilga CD, Brainerd EL, Camp AL; Wageningen UR, Brown U, U Illinois Urbana-Champaign, U Alaska Anchorage, U Liverpool*	Food capture, transport and swallowing in white-spotted bamboo sharks (*Chiloscyllium plagiosum*)

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

10:00 AM – 11:30 AM **Session 18** **Room 20**

DPCB Best Student Paper: Wake Award

Chair: Todd Oakley

10:00 am	**18-1**	*Bodensteiner BL, Muñoz MM; Virginia Tech*	Adaptive Radiation in the Multidimensional Phenotype
10:15 am	**18-2**	*Law CJ, Mehta RS; Univ of California, Santa Cruz*	Carnivory maintains cranial dimorphism between males and females: Evidence for niche divergence in extant Musteloidea
10:30 am	**18-3**	*Borstein SR, McGee MD, O'Meara BC; University of Tennessee, Knoxville, Monash University*	A classic evolutionary innovation does not lead to increased diversification
10:45 am	**18-4**	*David KT, Oaks JR, Halanych KM; Auburn University*	Much Ado About Orthologs: Consequences of Duplication and Speciation in Gene Evolution
11:00 am	**18-5**	*Glon H, Daly M; The Ohio State University*	Cold-Water Connections: Systematics and Biogeography of the Sea Anemone Genus *Metridium* (Cnidaria: Actiniaria: Metridiidae)
11:15 am	**18-7**	*Hart PB, Niemiller ML, Burress ED, Armbruster JW, Chakrabarty P; Louisiana State University, University of Alabama, University of California, Auburn University*	Phylogenomics and Shape Variation Among Amblyopsid Fishes

11:30 am ..... **Lunch Break** .....

10:30 AM – 12:15 PM **Session 19** **Room 21**

Visual Signals

Chair: Nate Morehouse

10:30 am	**19-1**	*Morris DJ, Outomuro D, Morehouse NI; University of Cincinnati*	Understanding the Evolution of Color Vision Via Adaptive Walks Through Discrimination Landscapes
10:45 am	**19-2**	*Taff CC, Zimmer C, Vitousek MN; Cornell University*	Plumage Manipulation Alters Social Interactions and Reproductive Success in Female Tree Swallows
11:00 am	**19-3**	*Defino NJ, Fox JL; Case Western Reserve University*	Dissecting the effects of flight behavior and neuromodulation on gaze control
11:15 am	**19-4**	*Morehouse NI, Echeverri SA, Bruce M, Long S, Jakob E, Zurek DB; U Cincinnati, UPittsburgh, UMass Amherst*	Managing Distraction: How Male Courtship Displays Attract and Retain Female Visual Attention in a Jumping Spider
11:30 am	**19-5**	*Green PA, Caves EM, Zipple MN, Peters S, Johnsen S, Nowicki S; Duke University*	Categorical Perception of a Carotenoid-based Assessment Signal
11:45 am	**19-6**	*Caves EM, Zipple MN, Green PA, Peters S, Johnsen S, Nowicki S; Duke University*	Categorical Perception of Color Along a Blue-Green Continuum in Female Zebra Finches
12:00 pm	**19-7**	*Outomuro D, Zurek DB, Taylor LA, Cronin TW, Dharmaraaj B, Kunte K, Morehouse NI; University of Cincinnati, University of Florida, University of Maryland, Baltimore County, National Centre for Biological Sciences*	The evolution of colour vision across jumping spiders

12:15 pm ..... **Lunch Break** .....

10:00 AM – 11:45 AM **Session 20** **Room 22**

Education: Creative Programs & Practices

Chairs: Kelly Kissane, Kirt Onthank

10:00 am	**20-1**	*Fernandes JS; St. Petersburg College, Tarpon Springs*	Nature is the Classroom
10:15 am	**20-2**	*Kissane KC; Blinn College*	Increasing Student Engagement and Retention in Biology by Using Outdoor Projects
10:30 am	**20-3**	*Walters LJ, Schneider K, Tripp M; University of Central Florida*	Using Peer Coaches to Enhance Curriculum-Based, High-Impact Practices for Undergraduates
10:45 am	**20-4**	*Seth D, Kaczmarczik M; Villanova University, Academy of Natural Sciences of Drexel University*	Integration of Biology and Engineering for K-12 Students
11:00 am	**20-5**	*Onthank KL; Walla Walla University*	Shouting into the Abyss or Preaching to the Choir? My Experience Video Blogging My Research on YouTube.
11:15 am	**20-6**	*Connors PK, Light JE, Tanis BP, Drew JA, Anderson CN, Hinde K; Univ of Utah, Texas A&M Univ, Oregon State Univ, Columbia Univ, Dominican Univ, Arizona State Univ*	March Mammal Madness: a Story about Science and Social Media
11:30 am	**20-7**	*Tanner RL; Washington State Univ*	Social change for climate change: communication tactics from the National Network for Ocean and Climate Change Interpretation

11:45 am **Lunch Break**

10:00 AM – 11:45 AM **Session 21** **Room 23**

Thermal Tolerance and Fluctuating Thermal Environments

Chairs: Daniel Lieras, Sean Brady

10:00 am	**21-1**	*Johnson D, Stahlschmidt ZR; Univ of the Pacific*	What influences thermal maxima in urban ants?
10:15 am	**21-2**	*Moyen NE, Somero GN, Denny MW; Stanford University*	Heating Rate Affects Thermal Tolerance in Intertidal Mussels
10:30 am	**21-3**	*Welling EM, Burnett L, McElroy E; University of Charleston, College of Charleston*	Aerobic scope of cultured juvenile red drum, *Sciaenops ocellatus*, at high summer water temperatures
10:45 am	**21-4**	*Melicher DM, Yocum GD, Torson AS, Rinehart JP; United States Department of Agriculture, University of Western Ontario*	Immediate transcriptional response of *Megachile rotundata* to a temperature pulse under a fluctuating thermal regime
11:00 am	**21-5**	*Kingsolver JG, Moore ME, Augustine KE, Hill CA; UNC-Chapel Hill*	Responses of insect larvae to heat waves: what doesn't kill you makes you weaker
11:15 am	**21-6**	*Frenette BD, Gido KB, Tobler M; Kansas State University*	Metabolic Physiology of Minnows Exposed to Stable and Variable Thermal Environments
11:30 am	**21-7**	*Brady SP, Raffel TR; Oakland University*	Thermal Acclimation Effects on Metabolic Performance in the Mexican Axolotl, *Ambystoma mexicanum*

11:45 am **Lunch Break**

10:15 AM – 12:00 PM **Session 22** **Room 24**

DCE Best Student Paper: Aubrey Gorman Award

Chairs: Loren Buck, Sharon Lynn

10:15 am	**22-1**	*Khalil S, Welklin JF, McGraw KJ, Webster MS, Karubian J; Tulane University, Cornell University, Arizona State University*	Testosterone, Gene Expression, and Plasma Carotenoids Underlie Red Plumage Ornamentation in the Red-backed Fairywren
10:30 am	**22-2**	*Martillotti AW, Tsai PS; University of Colorado, Boulder*	An adipokinetic hormone acts as a volume regulator in the intertidal gastropod mollusk, *Aplysia californica*
10:45 am	**22-3**	*Lewis AK, Cohn MJ; University of Florida*	The anti-androgenic fungicide vinclozolin disrupts sexual differentiation of the external genitalia
11:00 am	**22-4**	*Vernasco BJ, Horton BM, Ryder TB, Moore IT; Virginia Tech, Millersville University, Smithsonian Institution*	Reduced cooperative behavior as a cost of high testosterone in male wire-tailed manakins

11:15 am	**22-5**	*Ensminger DC; The Pennsylvania State University*	Effects of maternal glucocorticoids on offspring absolute telomere length in wild lizards.
11:30 am	**22-6**	*Alaasam VJ, Duncan R, Casagrande S, Davies S, Sidher A, Seymoure B, Shen Y, Zhang Y, Ouyang JQ; University of Nevada, Max Planck Institute for Ornithology, Quinnipiac University, Colorado State University*	Not So Cool: Cool Color-Temperature Light Disrupts Nocturnal Rest and Elevates Glucocorticoids in Zebra Finches (*Taeniopygia guttata*)
11:45 am	**22-7**	*Owen DAS, Sheriff MJ, Langkilde T; The Pennsylvania State University*	Effects of Maternal Stress on Lizard Heart Rate
12:00 pm		**Lunch Break**	

10:15 AM – 12:00 PM **Session 23** **Room 25**

Invertebrate Evo-Devo

Chairs: Ariel Chipman, Austen Barnett

10:15 am	**23-1**	*Chipman AD; The Hebrew University of Jerusalem*	*Oncopeltus, Tribolium, Drosophila* – a three-taxon problem for understanding the evolution of segmentation in insects
10:30 am	**23-2**	*Babonis LS, Martindale MQ; Univ of Florida, Whitney Lab*	Double your fun: gene duplication and the diversification of novel cell types
10:45 am	**23-3**	*Range RC; Auburn University*	Evolution of Anterior-Posterior Axis Specification and Patterning: Insights from the Sea Urchin Embryo
11:00 am	**23-4**	*Lochab AK, Extavour CG; Harvard University*	Investigating the Molecular Basis of PGC Specification and Migration in a Hemipteran Insect
11:15 am	**23-5**	*Drewell R, Klonaros D, Dresch J; Clark University*	Deciphering the evolution of regulatory grammar in Drosophila Hox gene enhancers
11:30 am	**23-6**	*Barnett AA, Nakamura T, Extavour CE; DeSales University, Harvard University*	Hox Genes Limit Germ Cell Formation in the Short Germ Insect *Gryllus bimaculatus*.
11:45 am	**23-7**	*Rodriguez LF, Cole J, Fenner J, Counterman B; Mississippi State University*	GENETICS OF STRUCTURAL COLORATION IN PIERID BUTTERFLY WINGS
12:00 pm		**Lunch Break**	

10:00 AM – 11:30 AM **Session 24** **Room 12**

Cell & Molecular Physiology

Chair: Jonathan Snow

10:00 am	**24-3**	*Snow JW, Deoras N, MacLeod SG, Shih SR, Johnston B, Adames T; Barnard College, Columbia University*	Newly Eclosed HoneyBees Have an Immature Heat Shock Response
10:15 am	**24-4**	*Rifai NM, Mykles DL; Colarodo State University*	Effects of Molt Induction Methods on Cyclic Nucleotide Phosphodiesterase Expression in the Decapod Crustacean Molting Gland
10:30 am	**24-5**	*López-Cerón A, Bunting N, Mykles D; Colorado State University*	Effects of temperature and molt stage on the expression of stress-response genes in the Y-organ of the blackback land crab, *Gecarcinus lateralis*
10:45 am	**24-6**	*Janis B, Janis S, Yavuzcetin O, Solocinsk J, Chakraborty N, Menze MA; University of Louisville, University of Wisconsin-Whitewater, University of Michigan-Dearborn*	Liquid-Liquid Phase Separation Behavior of a Crustacean Late Embryogenesis Abundant Protein
11:00 am	**24-7**	*Belott CJ, Menze MA; Univ of Louisville*	Membraneless Organelles in Desiccation Tolerance: A New Phase in Physiology
11:15 am	**24-8**	*Koch JC, Verde EA, Weis VW; Oregon State University, Maine Maritime Academy*	Low carbonic anhydrase activity in *Elliptochloris*-containing *Anthopleura elegantissima* and the negative correlation between diameter and carbonic anhydrase activity.
11:30 am		**Lunch Break**	

Friday Program Afternoon Sessions

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

1:30 PM – 3:15 PM **Session 25** **Room 1 & 2**

DAB Best Student Paper: Marlene Zuk Award

Chairs: Jenny Gumm, Erica Westerman

1:30 pm	**25-1**	*Fannjiang C, Kakani K; Monterey Bay Aquarium Research Institute University of California*	Using machine learning to deduce fine-scale behavior of jellyfish (*Chrysaora fuscescens*) in Monterey Bay
1:45 pm	**25-2**	*Howell CR, Anderson RC, Derryberry EP; University of Tennessee, Knoxville, Florida Atlantic University*	Solving is Sexy: the role of problem-solving ability in mate choice in zebra finches (*Taeniopygia guttata*)
2:00 pm	**25-3**	*Mackiewicz AG, Putland RL, Mensinger AF; University of Minnesota Duluth*	The effect of anthropogenic noise on Oyster Toadfish (*Opsanus tau*) vocalizations
2:15 pm	**25-4**	*Pruett JE, Fargevieille A, Warner DA; Auburn University*	Maternal nest choice and the effects of nest microclimate on egg survival in the brown anole
2:30 pm	**25-5**	*Roberts NS, Mendelson TC; University of Maryland Baltimore County*	Measure of a Mate: The Role of Male and Female Pattern Elements in Conspecific Mate Choice
2:45 pm	**25-6**	*Smith HE, Hoover SR, Salmon M, Seaman H, Coppenrath CM, Hirsch S, Perrault JR; Florida Atlantic University, Loggerhead MarineLife Center*	Effect of the Fire Ant Pesticide Hydramethylnon (AMDRO®) on the Nest Survival and Hatchling Orientation of Loggerhead Sea Turtles
3:00 pm	**25-7**	*Somjee U, Woods A, Duell M, Kohn G, Miller CW; University of Florida, Gainesville, Smithsonian Tropical Research Institute*	The metabolic costs of maintaining a sexually selected weapon

3:15 pm **Coffee Break** **Exhibit Hall**

1:30 PM – 3:30 PM **Session 26** **Room 3 & 4**

Let's get Physical-Biophysical Ecology

Chair: Alex Gunderson

1:30 pm	**26-1**	*Florey CL, Moore PA; Bowling Green State University, University of Michigan Biological Station*	Comparison of Burrow Structure Between Crayfish Species
1:45 pm	**26-2**	*Sandfoss MR, Lillywhite HB; Univ of Florida*	Water relations of an insular population of Florida cottonmouth snakes, *Agkistrodon conanti*.
2:00 pm	**26-3**	*Johnsen S, Nijhout HF; Duke Univ*	Super-black butterfly uses stealth technology: honeycomb absorbing structures in the scales of the wings of *Trogonoptera brookiana*
2:15 pm	**26-4**	*Novarro AJ; Swarthmore College*	Widespread and Misunderstood: An Integrative Approach to Thermal Ecology in the Eastern Red-Backed Salamander
2:30 pm	**26-5**	*Gunderson AR, Riddell EA, Rosenblum EB; Tulane University, UC Berkeley*	Balancing the need to stay warm and stay safe: thermal consequences of color evolution in White Sands lizards
2:45 pm	**26-6**	*Woods HA, Larkin BG, Dahlhoff VC; Univ of Montana, MPG Operations, LLC*	Thermal ecology of small ectotherms in mosaics of plant-generated microclimates: aspens and aspen leaf miners
3:00 pm	**26-7**	*Dillon ME, Woods HA, Pincebourde S; Univ or Wyoming, Univ of Montana, Univ of Tours, France*	Sampling frequency in thermal ecology: Do missed extremes and interpolated means matter?
3:15 pm	**26-8**	*Carbeck KM, Demoranville KJ, D'Amelio PB, Goymann W, Trost L, Pierce BJ*, Bryla A, Dzialo M, Bauchinger U, McWilliams SR; Canisius College, Univ of Rhode Island, Max Planck Inst. for Ornithology, Sacred Heart Univ, Jagiellonian Univ*	Environmental cues and dietary antioxidants affect breeding behavior and testosterone of male European Starlings (*Sturnus vulgaris*)

3:30 pm **Coffee Break** **Exhibit Hall**

1:30 PM – 3:15 PM **Session 27** **Room 5 & 6**

DEDE Best Student Presentations

Chair: Travis Wilcoxen

1:30 pm	**27-1**	*Pyle TJ, Siefferman L; Appalachian State University*	Influence of animal personality and density on *Mycoplasma gallisepticum* prevalence in Eastern bluebirds
1:45 pm	**27-2**	*Bowen V, McMahon TA, Fernandez-Denmark S, Grim JM; University of Tampa*	The impacts of early life exposure to the broad-spectrum antiparasitic Ivermectin on long-term growth rates, organ growth, and susceptibility to chytridiomycosis in juvenile amphibians
2:00 pm	**27-3**	*Tylan C, Langkilde T; Pennsylvania State University*	Surviving the Invader: What Branches of the Immune System are Altered by Multigenerational Exposure to a Novel Predator?
2:15 pm	**27-4**	*Names G, Krause J, Angelier F, Schultz E, Wingfield J; Univ of California, Univ of Nevada, Centre d'Etudes Biologiques de Chizé, CNRS, Kenyon College*	Relationships between Avian Malaria and Immunomodulatory Hormones in a Hawaiian Honeycreeper
2:30 pm	**27-5**	*Josefson CC, Heard RE, Hood WR; Auburn University*	Trans-generational effects during development following maternal immune challenge in a lactating rodent
2:45 pm	**27-6**	*Ramsay CR, Rohr JR; University of South Florida*	Order of Infection Impacts Disease Progression in Frogs
3:00 pm	**27-7**	*Wilsterman K, Alonge MM, Ernst DK, Limber CA, Treidel LA, Bentley GE; UC Berkeley, Las Positas College*	A test of the energy limitation hypothesis: acute food restriction prevents sickness behavior but not the immune response in female zebra finches

3:15 pm **Coffee Break** **Exhibit Hall**

1:30 PM – 3:15 PM **Session 28** **Room 13**

Partners for Life-Symbiosis

Chair: Miguel Reyes

1:30 pm	**28-1**	*James E, Feng H, Lu H, Wilson A; University of Miami, MingDao University*	The role of mTOR at a symbiotic interface
1:45 pm	**28-2**	*Cheam D, Hueffmeier BW, Nishiguchi MK; New Mexico State University*	Noshing on *Vibrio* - How Grazing 'Outside the Host' Determines 'Fitness Inside the Host'
2:00 pm	**28-3**	*Reyes ML, Gerardo N, Parker B; Clayton State University, Emory University, University of Rochester*	The Impact of symbiotic bacteria on reproductive strategies and wing polyphenism in pea aphids responding to stress.
2:15 pm	**28-4**	*Bedgood SA, Bracken MES; Univ of California, Irvine*	Sea Anemone Diet Affects Algal Symbiont Photochemical Efficiency
2:30 pm	**28-5**	*Reich HG, Rodriguez IB, Lajeunesse TC, Ho TY; Penn State University, Academia Sinica, Taiwan*	Iron limits coral symbionts' survival to heat stress
2:45 pm	**28-6**	*McElmurray P, Bell S, Cathey SE, Justus SR, Creed RP, Brown BL; Virginia Tech, University of Alabama, Appalachian State University*	Colonization Tradeoffs in Symbioses: A Collection of Interesting Hypotheses
3:00 pm	**28-7**	*Hill A, Hill M, Hall C, Sacristan-Soriano O, Riesgo A, Camilli S, Delbeau M, Dwaah H; Bates College, Univ of Virginia, Univ of Richmond, Natural History Museum*	Sponge:Algal symbioses and the molecular genetic pathways involved in host:symbiont associations

3:15 pm **Coffee Break** **Exhibit Hall**

1:30 PM – 3:30 PM **Session 29** **Room 16 & 17**

Groovin' as a Groupie-Population Ecology

Chair: Nathan Senner

1:30 pm	**29-1**	*Kiskaddon EP, Dorgan KM, Berke SK; Dauphin Island Sea Lab, Siena College*	Impacts of the Deepwater Horizon Oil Spill on Phylogenetic Diversity of Benthic Infauna in the Northern Gulf of Mexico
1:45 pm	**29-2**	*Krinos AI, Dixon K, Ross A, Stock CA; OAR, NOAA*	Understanding spatial effects of climate change on Chesapeake Bay blue crab using statistical downscaling and agent-based modeling

2:00 pm	**29-3**	*Wilber MQ, Chinn SM*, Beasley JC, Pepin KM; USDA, Colorado State Univ, Univ of Georgia*	Selection for agricultural crops predicts space use of a rapidly expanding invasive species in North America
2:15 pm	**29-4**	*Ruppert KM, Bare EA, Kline RJ, Rahman MS; University of Texas Rio Grande Valley*	Development of a New Environmental DNA Assay for Detection of the Rio Grande Siren in Highly Turbid Water
2:30 pm	**29-5**	*Thawley CJ, Hall JM, Kolbe JJ; University of Rhode Island, Auburn University*	Turn Up the Lights in Here: Impacts of Artificial Light at Night on Anoles
2:45 pm	**29-6**	*Thomas S, Purrenhage JL, Foster A, Loucek J, Roeder A, Branch TL, Moore FBG, Niewiarowski PH; The University of Akron, University of New Hampshire*	Spotted salamander (*Ambystoma maculatum*) breeding population structure and dynamics across 20 years at a northeastern Ohio pond
3:00 pm	**29-7**	*Senner NR, Sasser KT, Wolf CJ, Velotta JP, Schweizer RM, Stager M, Cheviron ZA; University of South Carolina, University of Montana*	The Effect of Aerobic Performance on High-Elevation Deer Mouse Survival
3:15 pm	**29-8**	*Anderson SJ, Cowles DL; Walla Walla University*	Is the Eelgrass Isopod a Vector for *Labyrinthula zosterae* Wasting Disease on *Zostera marina*?
3:30 pm		**Coffee Break**	**Exhibit Hall**

1:30 PM – 3:30 PM **Session 30** **Room 20**

Molecular Evolution

Chairs: David Plachetzki, Susan Rashid

1:30 pm	**30-1**	*Cox RM, Cox CL, Wittman TN, Mitchem LB, Card DC, Andrew AL, Castoe T, McGlothlin JW; University of Virginia, Georgia Southern University, Harvard University, Univ of Texas, Arlington, Virginia Tech*	Hormonal regulation of gene expression and the developmental breakdown of between-sex genetic correlations in *Anolis* lizards
1:45 pm	**30-2**	*Rashid SB, Tassia MG, Halanych KM, Moss AG; Auburn University*	Matrix Metalloproteinase Gene Evolution in Ctenophora
2:00 pm	**30-3**	*Sondhi Y, Theobald J, Kawhara AY; Florida International University, University of Florida, Gainesville*	Evolution of Light Sensing Opsins in Insects
2:15 pm	**30-4**	*Escobar-Camacho D, Carleton K, Narain D, Pierotti M; University of Maryland, College Park, Anton de Kom University of Suriname, Smithsonian Tropical Research Institute*	The visual system of Characiformes: a window to the teleosts lineage
2:30 pm	**30-5**	*Provencher C, Chan JC, Spillane J, Plachetzki DC*; University of New Hampshire*	Focusing in on the origin of opsins and phototransduction
2:45 pm	**30-6**	*Willis SC, Chang BSW, Rocha LA; California Academy of Sciences, University of Toronto*	Sexy red fish in the deep blue *see*: photosensory evolution across depth in sexually dimorphic coral reef fishes
3:00 pm	**30-7**	*Wheeler LC, Smith SD; University of Colorado-Boulder*	Computational Modeling of Anthocyanin Pathway Evolution
3:15 pm	**30-8**	*Guerra Canedo VI, Byrne M, Hart MW; Simon Fraser University, The University of Sydney*	Codon-model analyses of selection associated with the evolution of different modes of reproduction in sister species of sea stars
3:30 pm		**Coffee Break**	**Exhibit Hall**

1:30 PM – 3:30 PM **Session 31** **Room 21**

Stuck on You

Chair: Eric Edsinger

1:30 pm	**31-1**	*Diaz C, Tanikawa A, Miyashita T, Maksuta D, Amarpuri G, Dhinojwala A, Blackledge T; University of Akron, University of Tokyo*	The Moth Specialist Spider *Cyrtarachne akirai* Uses Prey Scales To Increase Adhesion
1:45 pm	**31-2**	*Bagheri H, Cummings S, Roy C, Casleton R, Wan A, Hu A, Berman SM, Peet MM, Aukes DM, He X, Fisher RE, Marvi H; Arizona State University, University of California, Los Angeles, University of Arizona*	Octopus Suckers: Functionality and Control

2:00 pm	**31-3**	*Peramba KB, Edsinger E*; Marine Biological Laboratory*	Imaging the neuromuscular systems of cephalopod arms and suckers.
2:15 pm	**31-4**	*Flammang BE, Cohen KE, Hernandez LP; New Jersey Institute of Technology, University of Washington, George Washington University*	Sucker with a Fat Lip: Functional Morphology of the Soft Tissues of the Remora Adhesive Disc
2:30 pm	**31-5**	*Wang S, Li L, Chen Y, Kenaley CP, Wainwright DK, Wood RJ, Wen L*; Beihang University, Harvard University, Boston College*	The detachment of remora: kinematics, dynamics, and a bio-robotic model
2:45 pm	**31-6**	*Standen EM, Turko AJ; University of Ottawa, University of Guelph*	The art of unsticking: Biomechanics of terrestrial adhesion in the amphibious fish *Kryptolebias marmoratus*
3:00 pm	**31-7**	*Garner AM, Klittich MR, Maksuta D, Niewiarowski PH, Dhinojwala A; University of Akron*	The Role of Surface Lipids in the Self-Cleaning Ability of Gecko Subdigital Adhesive Pads
3:15 pm	**31-8**	*Boerma DB, Chung CC, Barrantes JP, Chaverri G, Swartz SM; Brown Univ, The Peddie School, Univ de Costa Rica*	How bats with suction cups land on low-friction leaves
3:30 pm		**Coffee Break**	**Exhibit Hall**

1:30 PM – 3:30 PM **Session 32** **Room 22**

Stabby and Crunchy

Chairs: Stephanie Crofts, Matthew Kolmann

1:30 pm	**32-1**	*Herbert A, Summers A, Wilga C; U Alaska, U Washington*	Morphology of the Jaws and Tooth Plates in Spotted Ratfish
1:45 pm	**32-2**	*Wilga C, Ditsche P, Jackson P, Natekin E, Ferry L, Dumont E; University of Alaska Anchorage, Arizona State University, University of California Merced*	The Function of Tessellated Cartilage in Shark Jaws
2:00 pm	**32-3**	*Kolmann MA, Cohen KE, Bemis K, Summers AP, Irish F, Hernandez LP; George Washington University, University of Washington, Virginia Institute of Marine Science, Moravian College*	The Whole Tooth and Nothing But: Tooth Replacement in Piranhas and Pacus
2:15 pm	**32-4**	*Bemis KE, Hilton EJ; Virginia Institute of Marine Science*	Tooth development and replacement in Longnose Lancetfish, *Alepisaurus ferox* (Teleostei: Aulopiformes: Alepisauridae)
2:30 pm	**32-5**	*Cohen KC, Weller HI, Summers AP; University of Washington, Brown University*	Getting to the tooth of the matter: a statistical test for functional homodonty
2:45 pm	**32-6**	*Crofts SB, Anderson PSL; University of Illinois at Urbana-Champaign*	The effect of cactus spine surface structure on puncture and anchoring performance
3:00 pm	**32-7**	*Unsworth CK, Abuhashim WA*, Brannoch SK, Svenson GJ, Astley HC; University of Akron, Case Western Reserve University, Cleveland Museum of Natural History*	Biomechanics of the Praying Mantis Foreleg Strike
3:15 pm	**32-8**	*Lowe A, Paig-Tran M; California State University, Fullerton*	*Corydoras julii*: The Scute and Slide Defense
3:30 pm		**Coffee Break**	**Exhibit Hall**

1:30 PM – 3:15 PM **Session 33** **Room 23**

Evolutionary Morphology

Chairs: Ian Cost, Teresa Feo

1:30 pm	**33-1**	*Koeller KLM, Stocker MR; University of Florida, Virginia Tech*	Investigating the Patterns of Convergence in Pectoral Girdle Reduction During the Evolution of Limblessness in *Lerista* (Scincidae)
1:45 pm	**33-2**	*Lailvaux SP, Mishra A, Hoque MT, Wilson RS; University of New Orleans, University of Queensland*	A machine learning approach to predicting the multivariate performance phenotype
2:00 pm	**33-3**	*Vallejo-Pareja MC, Daza JD, Maisano JA, Randle C, Thies ML; University of Florida, Sam Houston State University, University of Texas*	A characterization of miniaturized lizard skull traits based on a meta-analysis

2:15 pm	**33-4**	*Feo TJ, Saranathan V, Prum RO; Smithsonian, Yale-NUS College, Yale University*	The bizarre occipital feathers of the King of Saxony Bird of Paradise (Pteridophora alberti)
2:30 pm	**33-5**	*Kaashoek M, Nauwelaerts S, Aerts P; University of Antwerp, University of Ghent*	Comparison of the instantaneous axis of rotation between different monodactyl equids
2:45 pm	**33-6**	*Cost IN, Echols MS, Middleton KM, Holliday CM; U of Missouri, Echols Veterinary Services*	Assessing the Biomechanical Environment of an Extinct Parrot (Psittaciformes) Using Extant Parrot Models
3:00 pm	**33-7**	*Camarillo H, Tobler M; Virginia Tech, Kansas State University*	Functional consequences of morphological variation between locally adapted populations

3:15 pm ..... **Coffee Break** ..... **Exhibit Hall**

1:30 PM – 3:00 PM Session 34 Room 24

Going with the Unstable Flow

Chairs: Michael Fath, Ben Hightower

1:30 pm	**34-1**	*Matthews MG, Sponberg SN; Georgia Tech*	The wind around moth wings: Can vortices in the environment disrupt the leading edge vortex?
1:45 pm	**34-2**	*Burnett NP, Badger MA, Combes SA; Univ of California, Davis*	Flight planning on the wing: Honeybees assess obstacle motion from afar before deciding to land on or pass through wind-blown clutter
2:00 pm	**34-3**	*Xu RU, Zhang X, Liu HAO; Chiba University, Shanghai Jiao Tong University and Chiba University International Cooperative Research Centre (SJTU-CU ICRC)*	Dynamic Flight Stability in Hovering Bumblebee Can be Enhanced by Passive Feathering Mechanism: A Computational Study
2:15 pm	**34-4**	*Fath MA, Tytell ED; Tufts University*	Using Perturbations to Study Locomotor Stability in the Bluegill Sunfish (*Lepomis macrochirus*)
2:30 pm	**34-6**	*Cheney JA, Stevenson JPJ*, Durston NE, Usherwood JR, Bomphrey RJ, Windsor SP; Royal Vet. College, Univ of Bristol*	Avian gust rejection in gliding flight through updrafts
2:45 pm	**34-7**	*Hightower B, Ingersoll R, Shorr D, Chin D, Lentink D; Stanford University*	How Hummingbirds Reorient Forces During Maneuvering Flight

3:00 pm ..... **Coffee Break** ..... **Exhibit Hall**

1:30 PM – 3:30 PM Session 35 Room 25

Stress: It's a Mad Mad Mad Mad World

Chairs: Amy Newman, Selchie Menard

1:30 pm	**35-1**	*Goff CB; Texas State University*	Higher Water Temperatures Lower Physiological Health in Leopard Frog Tadpoles
1:45 pm	**35-2**	*Cinel SD, Kawahara AY, Taylor SJ; University of Florida, Florida Museum of Natural History, Illinois Natural History Survey*	Transcriptomic signals of cellular stress in fall armyworm (*Spodoptera frugiperda*; Lepidoptera: Noctuidae) brain tissue after prolonged auditory exposure to bat calls
2:00 pm	**35-3**	*Newman AEM; University of Guelph*	Is it what's on the inside, or the outside, that counts? Effects of season and urbanization on stress physiology and the microbiome.
2:15 pm	**35-4**	*Rahman MDS, Thomas P; University of Texas*	Effects of environmental hypoxia on reproductive endocrine functions, molecular and epigenetic signals in Atlantic croaker
2:30 pm	**35-5**	*Robertson JK, Burness G, Mastromonaco G; Trent University, The Toronto Zoo*	Stress-induced peripheral hypothermia: Role of the sympathetic nervous system in avian thermal modulation
2:45 pm	**35-6**	*Menard SS, Watson GM; University of North Carolina at Charlotte, University of Louisiana at Lafayette*	Epithelial Effects of Exposure to Streptomycin on the Tentacles of the Sea Anemone, *Nematostella vectensis*
3:00 pm	**35-7**	*Holden KG, Gangloff EJ, Bronikowski AM; Iowa State University, Station d'Ecologie Théorique et Expérimentale du CNRS*	Insulin and the Stress Response of Garter Snakes Exposed to Temperature Extremes

3:15 pm	**35-8**	*Walker BG, Villanueva C, Bertellotti M, Boersma PD; Fairfield University, Universidad Nacional del Comahue, Universidad del Chubut, University of Washington*	Potential of epigenetic effects in penguin chicks hatched in tourist-disturbed areas of breeding colonies in Argentina

3:30 pm **Coffee Break** **Exhibit Hall**

1:30 PM – 3:30 PM **Session 36** **Room 12**

Wintering/Overcooling

Chairs: Alex Torson, Heather Liwang

1:30 pm	**36-1**	*Torson AS, Doucet D, Roe AD, Sinclair BJ; University of Western Ontario, Great Lakes Forestry Centre*	Overwintering of the Asian long-horned beetle: Metabolic rate, cold tolerance, transcriptome, and metabolome
1:45 pm	**36-2**	*Potts LJ, Teets NM; Univ of Kentucky*	Overwintering Spiders: Physiological Responses to the Winter Season
2:00 pm	**36-3**	*Sinclair BJ; Western U*	Insect cold acclimation: Underlying mechanisms and opportunities for extrapolation
2:15 pm	**36-4**	*Do Amaral MCF, Dufresne S, Goines B, Tegge Z, Krane CK; Mount St. Joseph University, University of Dayton*	Cryoprotectant Production in the Freeze-Tolerant Cope's Gray Treefrog (*Dryophytes chrysoscelis*): Effect of Acclimatization on Hepatic Enzyme Activity
2:30 pm	**36-5**	*Brzezinski K, MacMillan HA; Carleton University*	An Investigation of Cold-Induced Barrier Disruption in the Gut Epithelia of *Locusta migratoria*
2:45 pm	**36-6**	*Reed KA, Bleau JM, Munden TMN, Lee SG, Park HK, Covi JA; Univ of North Carolina at Wilmington, Korean Polar Research Institute*	Keep calm and sleep on: how to survive as a zooplankton in an Antarctic freshwater lake
3:00 pm	**36-7**	*Rowsey LE, Reeve C, Speers-Roesch B; University of New Brunswick*	Do Thermal Constraints on Physiological Performance Drive Winter Dormancy in Fish?
3:15 pm	**36-8**	*Liwanag HEM, Pearson LE, Weitzner EL, Voisinet M, Whoriskey S, Harris HS, Tomanek L, Johnson S; Cal Poly San Luis Obispo, The Marine Mammal Center*	Development of Thermoregulatory Capability in Weddell Seal Pups

3:30 pm **Coffee Break** **Exhibit Hall**

7:00 PM – 8:00 PM **BART Lecture** *Sponsored by Sable Systems* **Room 14-17**

BART Lecture	*Dantzer B; University of Michigan*	Plasticity, Hormones, Behavior, and Fitness: Understanding the Long-Reach of the Mother in Wild Animals

FRIDAY POSTER SESSION P1

Central Exhibit Hall, 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

Science 101 - Education in Action

P1-1	*Varner J, Connors PK*, Brown JS, Dizney L, Duggan JM, Erb LP, Flaherty EA, Hanson J, Lanier HC, Yahnke CJ; Colorado Mesa Univ, Univ of Utah, Moffitt Cancer Center, Univ of Portland, California State Univ, Warren Wilson College, Purdue Univ, Columbus State Univ, Univ of Oklahoma, Univ of Wisconsin Stevens Point*	Squirreling Around for Science: Incorporating Sciurid Behavioral Research into Undergraduate Curriculum
P1-2	*Tsunekage T, Bishop CR, Long CM, Levin II; Agnes Scott College*	Integrating information literacy training into an inquiry-based introductory biology laboratory
P1-3	*Whitenack LB, Staab KL, Danos N; Allegheny College, McDaniel College, University of San Diego*	What are the core concepts of vertebrate morphology?
P1-4	*Oufiero CE; Towson Univ*	The Organismal Form and Function lab-course: a new C.U.R.E. for engaging students in authentic research experiences in organismal biology.
P1-5	*Lindsay SM, Borger EC; University of Maine, Orono*	Developing Scientist Spotlights to Help Marine Science Undergraduates Build Metacognitive Skills and Science Identity
P1-6	*Furimsky MM, Balczon JM; Westminster College*	Designing an International Travel Course for Both Biology and Non-Biology Majors
P1-7	*Stinson CM; California State University*	Incorporating Ethics Into Introductory Biology and Human Physiology Curriculum
P1-8	*Staab KL, Martinson HM, Scullion J; McDaniel College*	A framework to incorporate collaborative research on habitat health in the undergraduate classroom
P1-9	*Flores DV, Strickland JT, Bodensteiner BL, Janzen FJ*; Iowa State University, U.S. Fish and Wildlife Service, Virginia Tech University*	Planting an Outreach TREE: Exposing Diverse Students to Ecological Research with Reptiles
P1-10	*Domenech S, Lafond B, Long M, Seligman C, Gilchrist S; New College of Florida*	Implementing High Impact Practices in a Study Abroad Program at Cayos Cochinos, Honduras
P1-11	*Rivera AS, Ahmadyar S, Eitoku J, Ha J, Imada K, Lee A, Lo A, Navalta K*, Panaglotopoulos A, Vu K, Yee C; Univ of the Pacific*	Student-generated resources for an EvoDevo Open Textbook (OER)
P1-12	*Belanger RM, Grabowski GM, Joshi GS, Tuttle JE; University of Detroit Mercy,*	Exploring the pathophysiology of diabetes: Development of an inquiry-based laboratory module
P1-13	*Bird NC; Univ of Northern Iowa*	The Ever-Evolving Comparative Vertebrate Anatomy Final Project: An Alternative to Comprehensive Lecture Finals
P1-14	*Burnett NP, Combes SA; Univ of California, Davis*	Putting interviews to the test: What biases do you face when interviewing for a post-doc?
P1-15	*Lewis AK; University of Florida*	Feminization of mouse male external genitalia and digit ratio: Inappropriate applications of gendered terms in sex biology
P1-16	*Pfeiffenberger JA, Donatelli CM, Mekdara PJ, Fath MJ, Khanna S, Shen TH, Tytell ED; Tufts Univ*	Design your own fish! Engaging museum visitors in biomechanics research
P1-17	*Wilson AE, Pollack JL, Billick I, Domingo C, Fernandez-Figueroa EG, Nagy ES, Steury TD, Summers AP*; Auburn University, NIH, RMBL, San Francisco State University, Mountain Lake Biological Station, University of Washington*	Structured Undergraduate Research Programs Make a Difference!

Complementary to S3: Playing with Power: Mechanisms of Energy Flow in Organismal Movement

P1-18	*Singh K, Hidalgo F, Voesenek CJ, Berg O, Müller UK; California State University Fresno, Wageningen University*	A dynamically scaled mechanical model of a suction feeder based on the traps of the carnivorous plant *Utricularia*
P1-19	*Rimkus B, Shehaj A, Konow N; UMASS Lowell*	Do Muscles with Distinct Fiber Architecture, Fiber-type Composition, and Mechanical Function have Different Modulatory Scopes for Power and Work Production?
P1-20	*Shehaj A, Rimkus B, Konow N; UMass Lowell*	Differences in Stress-strain and Power-velocity Properties between Muscles with Distinct Fiber Type Composition, Architecture and Mechanical Function

Solid Mechanics: Resisting, Bending and Breaking

P1-21	*Caudle HI, Mehta R, Uyeno TA, Clark AJ; College of Charleston, University of California, Valdosta State University*	Are loose skins required for moray eel knotting?
P1-22	*Smith SK, Phelps SM; Univ of Texas, Austin*	Vocal Morphology and Elaborate Display Behavior in Singing Mice
P1-23	*Rehorek SJ, Stimmelmayr R, George JC, Suydam R, McBurney DM, Thewissen JGM; Slippery Rock University, University of Alaska, North Slope Borough, NEOMED*	Role of Desmosomes in the Annual Molting of the External Acoustic Meatus Lining of the Bowhead Whale (*Balaena mysticetus*): A Preliminary Study.
P1-24	*Riordan KC, Taylor JRA; West Chester University of Pennsylvania, Scripps Institution of Oceanography*	Mechanical Adaptions for Climbing in Grapsid Crabs
P1-25	*Munteanu VD, Diamond KM, Schneider NG, Riley AB, McKamy AJ, Blob RW; Clemson University*	Effects of Ecological Transitions on Locomotor Morphology: Do Changes in Bone Loads Have Implications for Limb Elongation in Arboreal Tetrapods?
P1-26	*Huber D, Travis K, Grace M, Ford J, Decker S; The University of Tampa, California State University Long Beach, National Oceanic and Atmospheric Administration, University of South Florida*	Structural Mechanics of Cookie Cutter Shark Jaws
P1-27	*Croghan JA; Ohio University*	Two Turtles, Two Diets, Two Biomechanical strategies: Jaw Biomechanics in a Generalist Versus a Durophagous Species of Emydid
P1-28	*Stewart MS, Kruppert S, Schmitz L, Summers A; Scripps College, Univ of Washington, Claremont McKenna College*	Written in Bone: Damage Patterns in *Agonopsis vulsa* Armor Plates
P1-29	*Regan MC, Gibb AC; Wake Forest Univ, Northern Arizona Univ*	Comparison of resistance to tearing in the skin of two flatfishes of the Pacific Northwest
P1-30	*Crofts SB, Lai Y, Hu Y, Anderson PSL; University of Illinois, Georgia Institute of Technology*	Taking a stab at quantifying sharpness in snake fangs
P1-31	*Abiri NF, Galloway K, Porter ME; Florida Atlantic University*	Effect of orientation on the flexural stiffness of lionfish, *Pterois volitans*, dorsal spines using 3D printed models
P1-32	*Kaczmarek EB, Kolmann MA, Grear ME, Summers AP; Brown University, George Washington University, Pacific Northwest National Laboratory, University of Washington*	Thorn on my side? Form, function, and evolution of defensive weaponry in doradid catfishes
P1-33	*Hung YT, Lin TY, Shih MC, Chi KJ*; National Chung-Hsing University*	Functioning Mechanism and Detachment Process of the Tentacular Suckers in Cuttlefish *Sepia pharaonis*
P1-34	*Jeffries L, Matloff L, Feo T, Lentink D; Stanford Univeristy, Smithsonian Institution of Birds*	Overlapping Feathers Maintain Contact through Interlocking Microstructures during Wing Morphing
P1-35	*Handy SH, Arnette JP, Ceja M, Poff MA, Owerkowicz T; California State University, San Bernardino*	Heat Exchange Through the Skin of the American Alligator: Do Osteoderms Play a Role?
P1-36	*Gong Z, Jaffe NH, Bland R, Cohen CS; EOS, SFSU, Univ of California, Berkeley*	Who is Stronger: Attachment Strength of *Leptasterias* spp. in Relation to Microhabitats and Clades
P1-37	*Law CJ, Duran E, Hung N, Richards E, Santillan I, Mehta R; Univ of California, Santa Cruz*	Cranial shape differences do not translate to bite force differences between musteloids with distinct dietary ecologies

Fluid Dynamics

P1-38	*Hawkins O, Tack N, Du Clos K, Gemmell BJ; University of South Florida*	Does the wing-like shape of an oceanic plankton predator provide hydrodynamic camouflage?
P1-39	*Ozalp MK, Miller LA; Univ of North Carolina, Chapel Hill*	The Effect of Immersed Structures on Zooplankton Swimming
P1-40	*Cabrera S, Emlet R; University of Florida, University of Oregon*	Buoyancy and Swimming Behavior in Two Balanid Cyprids
P1-41	*Jiminez M, Murtagh N, Waldrop LD; New Mexico Institute of Mining and Technology*	Micro Particle Image and Tracking Velocimetry for Assessing Flow in the Circulatory System of Tunicates
P1-42	*Seber EK, Karakas F, Murphy DW, Byron ML; Penn State University, University of South Florida*	Fluid dynamics of ciliary propulsion at intermediate Reynolds number: locomotion across ontogeny in the Atlantic ctenophore *Mnemiopsis leidyi*
P1-43	*Gilpin W, Prakash VN, Prakash M; Stanford University*	Vortex Arrays and Chaotic Mixing by Swimming Starfish Larvae
P1-44	*Javier JP, Paig-Tran EWM; California State University, Fullerton*	Filtration Along a Reticulated Mesh, Anatomy Predicts Feeding Ecology in Neonatal Whale Sharks, *Rhincodon typus*
P1-45	*Gellman ED, Tandler T, De La Cruz DB, Ellerby DJ; Wellesley College*	Drag Coefficient Estimates from Coasting Bluegill Sunfish (*Lepomis macrochirus*)
P1-46	*Huber D, Cunningham T, Casareto S, Amplo H, Ford J, Decker S, Mara K; The University of Tampa, New Jersey Institute of Technology, University of South Florida, University of Southern Indiana*	Fluid Dynamics of Hammerhead Shark Locomotion
P1-47	*Sienkiewicz R, Billings M, Kennedy JH, Fish FE, Goldbogen JA, Potvin J*; Saint Louis University, Chaminade College Preparatory High School, West Chester University, Hopkins Marine Station – Stanford University*	Evaluating Airship Drag as a Predictor of Baleen Whale Drag
P1-48	*Dial TR, Lauder GV; Harvard University*	First-feeding prey capture: comparing zebrafish and guppies
P1-49	*Castaneda N, Mehta R; University of California, Santa Cruz*	Morphology and Kinematics of Suction Feeding in *Oxylebius pictus*
P1-50	*Wells LA, Hernandez LP, Staab KL; McDaniel College, The George Washington University*	Kinematics of cypriniform suction feeding: emerging patterns of functional diversity across sixteen species
P1-51	*Camp AL, Olsen AM, Hernandez LP, Brainerd EL; University of Liverpool, Brown University, George Washington University*	Ventral body muscles power suction feeding in channel catfish
P1-52	*Delgado Gomez S, Battaglioli S, Howell M, Cieri RL, Farmer CG; University of Utah, Trinity College Dublin*	Microfluidics and Gas Exchange in Reptilian Parenchyma
P1-53	*Callison WE, Holowka NB, Lieberman DE; Harvard University*	Born to Run and Breathe: Thoracic Adaptations for Ventilation in Humans and Other Cursorial Mammals
P1-54	*Luna M, Amthor A, Yaeger J, Noel A, Nadler N; Georgia Institute of Technology, Georgia Tech Research Institute*	Bio-Inspired Fluid Transport of Spanish Moss
P1-55	*Garrott M, Laun A; United States Naval Academy*	Biomimetic Caudal Fin for an Unmanned Underwater Vehicle (UUV)
P1-56	*Hammond L, Cerra K*, Curet O, Porter M, Meredith T; Florida Atlantic University*	Follow that smell: Fluid dynamics through the shark olfactory organ

Sensory Mechanics

P1-57	*Nixon B, Uyanik I, Yang Y, Cowan NJ; Johns Hopkins University*	Sensory salience affects sensorimotor delay in the tracking response of the glass knifefish
P1-58	*Ko DD, Lin HT; Imperial College London*	The Role of Head Roll during Dragonfly Visual Guidance
P1-59	*Harris MD, Deora T, Roth E; Univ of Washington, Indiana Univ*	Spatial Content of Visual Scenes Mediates Different Strategies for Gaze Fixation in Hawkmoths
P1-60	*Taylor BK, Corbin S; The University of North Carolina at Chapel Hill, The University of West Florida*	Bioinspired magnetoreception and navigation in non-orthogonal environments
P1-61	*Hardy AR, Hale ME; Univ of Chicago*	Mechanoreceptor distribution in fish pectoral fins: Clues for optimal sensor placement
P1-62	*Stokes KA, Skandalis D, Liao J; University of Utah, University of Florida*	Chronic stimulation during larval zebrafish development affects startle response
P1-63	*Hernandez AV, Cohen KE, Gibb AC, Porter ME; Florida Atlantic Univ, Univ of Washington, Northern Arizona Univ*	Why So Cirrihous? Functional morphology of cirri in Cottoidea species

Evolutionary Morphology and Paleobiology

P1-64	*Miller AL, Hearst LW; University of Tampa*	Evolution of Relative Eye Size in Scorpions
P1-65	*Collar DC, Tremaine S, Harrington RC, Friedman M; Christopher Newport University, Yale University, University of Michigan*	The Adaptive Landscape for Body Shape and Its Anatomical Determinants in Pelagiarian Fishes
P1-66	*Dipaolo EC, Mehta RS, Collar DC; Christopher Newport University, Univ of California, Santa Cruz, Phi Mu*	Cascading Anatomical Evolution Drives Body Elongation in Clinoid Blennies
P1-67	*Gutherz SB, O'Connor PM; Ohio University*	Postcranial Skeletal Pneumaticity in Cuculidae
P1-68	*Smith LB, Anderson CV, Roberts TJ, Liebl AL*; University of South Dakota, Brown University*	Transcriptome Gene Expression and Muscle Performance in *Anolis* Lizards
P1-69	*Liu J; SUNY University at Buffalo*	Weberian Apparatus Evolution in Fossil and Living Catostomids (Teleost, Cypriniformes)
P1-70	*Carter M, Hogan AVC, Balanoff AM, Bever GS; Johns Hopkins University School of Medicine*	Functional Correlates of Floccular Size in Pan-Aves
P1-71	*Erb AJ, Turner AH; Stony Brook University*	Braincase anatomy of the Paleocene crocodyliform *Rhabdognathus*.
P1-72	*Wynd BM, Martinez RN; Virginia Tech, Museo de Ciencias Naturales*	A review of vertebrate beak morphologies in the Late Triassic; a framework to phylogenetically place an enigmatic beak from the Ischigualasto Formation, San Juan, Argentina
P1-73	*Jasinski SE; State Museum of Pennsylvania*	Emydid turtles from the Miocene-Pliocene of the southern Appalachian Mountains and their implications for the evolution of the Emydidae
P1-74	*Dunn PO, Henschen AE, Whittingham LA; Univ of Wisconsin-Milwaukee*	Gene expression in a sexually selected plumage ornament
P1-76	*Pyles RA, Mathis KA, Stewart JR, Ecay TW; East Tennessee State University*	Impact of Eggshell Calcium on Skeletal Development in an Oviparous Snake
P1-77	*Nsangou AA, Staab KL; McDaniel College*	Pre-and post-natal development of the lower jaw in two live bearing *poeciliid* species.
P1-78	*Edwards KM, Reznick DN; University of California, Riverside*	Specialization for Two Feeding Modes in High and Low Predation Guppies (*Poecilia reticulata*)
P1-79	*Roston RA, Roth VL; Duke University*	The Evo-Devo of Cetacean Cranial Telescoping: A New Empirical Framework and Discoveries
P1-80	*Miyamae JA, Bhullar BAS; Yale University*	Starting to Smile: Comparative Ontogeny of Mammalian Facial Muscle

Metabolism and Energy Allocation

P1-81	*Draud TE, Chapple TK, Hahn TP, Wikelski M, Cornelius JM; Eastern Michigan University, Stanford University, UC Davis, Max Planck Institute*	Impact of severe winter conditions and reproductive status on heart rate in the opportunistically breeding red crossbill, Loxia curvirostra
P1-82	*Saintsing AJ, Full RJ; Univ of California, Berkeley*	Metabolic cost of robustness: Running after losing one or two legs
P1-83	*Soerensen MS, Korsmeyer KE; Hawaii Pacific University, Oahu*	Swimming energetics of coral reef fishes in wave-induced water motion
P1-84	*Degon ZD, Nicholson DJ, Chung A, Taylor Q, Curlis JD, Logan M, Neel L, Dubois MM, McMillan WO, Cox CL; Georgia Southern University, Queen Mary University of London, Smithsonian Tropical Research Institute, Arizona Univesity, Northeastern University*	Sex-specific relationships between energetics and ecotoparasites in a tropical lizard
P1-85	*Thompson SJ, Powers DR; George Fox University*	Is Daytime Mass Management and Pre-Roost Hyperphagia Common in Hummingbirds?
P1-86	*Ivanina AV, Sokolova IM; University of North Carolina at Charlotte, University of Rostock*	Effects of salinity on cellular energy budget of biomineralizing tissues of marine bivalves
P1-87	*McTernan MR, Sears MW, Anderson RA; Clemson University, West. Wash. University*	Higher Food Availability May Offset Energetic Limitations Associated With Less Activity Time

P1-88	*Lebenzon JE, Mohammad L, Mathers KE, Turnbull KF, Staples JF, Sinclair BJ; Western University, Univ of Calgary*	Burning Down the Powerhouse: Does Mitophagy Drive Metabolic Suppression During Diapause in the Colorado Potato Beetle (*Leptinotarsa decemlineata*)?
P1-89	*Edwards KM, Caine PB, Lacey LM, Hatch SA, Benowitz-Fredericks ZM; Bucknell Univ, Inst. Seabird Research & Cons.*	Chick Triglyceride Levels May Reflect Parental Provisioning Decisions in Response to Experimental Food Reduction
P1-90	*Gutierrez-Pinto N, LondoñO GA, Chappell MA, Storz JF; University of Nebraska-Lincoln, Universidad ICESI, University of California Riverside, University of Nebraska-Lincoln*	The effect of elevation on the aerobic scope of Andean birds
P1-91	*Rehfeldt E, Patel S, Hiatt DJ, Karjasevic A, McCue MD, Hatle JD; Univ of North Florida, Sable Systems International*	Effects of dietary restriction on the organismal oxidation of leucine in female grasshoppers
P1-92	*Lieffrig SA, Derrickson EM*; Loyola University Maryland*	The Influence of Dietary Protein:Carbohydrate Ratios on Body Composition in Two Species of Growing Mice
P1-93	*Azzolini JL, Denardo DF; Arizona State University*	Effects of Chronic Water-Deprivation on Oxidative State in a Drought-Tolerant Snake
P1-94	*Caine PB, Edwards KM, Hatch SA, Benowitz-Fredericks ZM; Bucknell Univ, Inst. Seabird Research & Cons.*	Long- and Short-term Effects of Food Intake on Circulating Energy Substrates in Free-Living Seabird Chicks
P1-95	*McCue MD, Klok J, Lighton JRB; Sable Systems International*	Running mice increase their metabolic rates, but don't increase rates of lipid oxidation

Reproductive Physiology

P1-96	*Bristow ML, Gabor CR, Huertas M; Texas State University*	Conspecific chemical communication in a live-bearing fish, *Poecilia latipinna*
P1-97	*Curry JE, Navara KJ; University of Georgia*	Natural sex ratio bias in Japanese quail, *Coturnix japonica*
P1-98	*Navara KJ, Wrobel ER; The University of Georgia*	Can birds lay more than one egg in a day? Yes they can!
P1-99	*Tamone SL, Deal CK, Fester M, Levy T, Manor R, Sagi A; University of Alaska Southeast, Ben Gurion University of the Negev*	Development of an enzyme-linked immunosorbent assay for Northern spot shrimp *Pandalus platyceros* vitellogenin and its application for studies into sexual differentiation
P1-100	*Edmonds KE; Indiana University Southeast*	Regulation of Gastrointestinal Development and Reproduction in the Marsh Rice Rat (*Oryzomys palustris*)
P1-101	*Snyder NM, Dickerman LD, Reed WL; North Dakota State Univ, Univ of Minnesota Duluth*	Seasonal trends in nesting physiology of adult Laughing Gulls (*Leucophaeus atricilla*)

Reproductive and Parental Behavior

P1-102	*Wibbels T, Navarro E, Mantano J, Rosas M, Marin G, Bonka A, Lopez M, Acosta H, Illescas F, Pena LJ, Burchfield P; Univ of Alabama at Birmingham, Gladys Porter Zoo, Ciudad Victoria, Ciudad Madero*	in-water Movements and Arribada Nesting Behavior in the Kemp's Ridley Sea Turtle Using Preprogrammed UAV Surveys During the 2018 Nesting Season
P1-103	*Bonka A, Wibbels T, Navarro E, Montano J, Rosas M, Marin G, Acosta H, Lopez M, Pena LJ, Burchfield P, Illescas F; Univ of Alabama at Birmingham, Gladys Porter Zoo, Ciudad Victoria, Ciudad Madero*	Quantifying Arribada Nesting Behavior Using Unmanned Aerial Vehicles (UAVs)
P1-104	*Whitlow SW, Butler JM, Maruska KP; Louisiana State University*	Behavioral, physiological, and neural correlates of ovulation in the African cichlid fish *Astatotilapia burtoni*
P1-105	*Baltzley M, Latham-Scott K, Wanderscheid N*, Ramos M, Batenhorst E; Western Oregon University*	The Effects of Larval Population Density and Social Interactions on Adult Fecundity in *Drosophila melanogaster*
P1-106	*Hartley JG, Gomes Aversa MD, Leese JM; DeSales University*	Female mate preference influenced by intrasexual competition and differences in male quality
P1-107	*Gogel CA, Mullin SM, Leese JM; DeSales University*	House Hunters: Cichlid Edition - Females in a monogamous pair determine nest site location
P1-108	*Powers MJ, Wilson AE, Heine KB, Hill GE; Auburn University*	A Meta-analysis of Patterns of Mate Choice in Copepods
P1-109	*Lane SJ, Linkous CR, Brewer V, Sewall KB; Virginia Polytechnic Institute and State University, New Mexico State University*	Female Aggression in Song Sparrows is Higher in Urban Habitats
P1-110	*Stierhoff ES, Carpenetti JM, Butler MW; Lafayette College*	The Relationship Between Degree of Immune Challenge in House Sparrow Nestlings and Parental Feeding Behavior
P1-111	*Heuermann TM, Curry RL; Villanova University*	Inter- and intra-specific variance in boldness behavior of hybridizing Black-capped and Carolina chickadees

P1-112 *Steele A, Langro J, Hunter T, Lynch KS; Hofstra University* — The role of prolactin in female brown-headed cowbird responses to nestling begging stimulus

P1-113 *Elderbrock EK, Small TW, Schoech SJ; College of Wooster, University of Memphis* — Nestling Corticosterone Levels are Increased After Adult Provisioning in Florida Scrub-Jays

P1-114 *Desana AN, Fargevieille AK, Warner DA; Seton Hill University, Auburn University* — Lizard Egg Predation by Marsh Crabs: Effects of Microhabitat and Crab Density on Egg Survival

P1-115 *Worthington SE, Hews DK; Indiana State University* — Colorful Ovoviviparous Lizards and Their Offspring

P1-116 *Nguyen TC, Saltzman W; University of California, Riverside* — Offspring Discrimination by Mothers and Fathers in a Biparental Mammal

P1-118 *Westrick SE, Studd EK, Boutin S, Humphries MM, Lane J, McAdam AG, Dantzer B; University of Michigan, McGill University, University of Alberta, University of Saskatchewan, University of Guelph* — Methods of Measuring Maternal Behavior in a Wild Small Mammal

P1-119 *Simpson RK, McGraw KJ, Doucet SM; University of Windsor, Arizona State University, University of Windsor* — The Evolution of Complex Courtship Traits: Covariation and Interactions between Hummingbird Displays, Feather Structure, and Color Appearance

Hormones - Reproduction, Growth, & Development

P1-120 *Keer SA, Prado M, May C, McMenamin S, Hernandez LP; The George Washington University, Boston College* — Developing a zebrafish model to investigate the role of thyroid hormone in proper mineralization of ear ossicles

P1-121 *Tokar DR, Milano L, Karjasevic A, Hatle JD; Univ of North Florida* — Characterizing the activation of Target of Rapamycin pathway in Lubber Grasshoppers in response to alteration of diet

P1-122 *Bersin TV, Cordova KL, Journey ML, Beckman BR, Lema SC; Cal Poly, San Luis Obispo, NOAA Fisheries* — Effects of nutritional stress on the sensitivity of liver IGF-1 production to GH in a Pacific rockfish

P1-123 *Campbell NA, Bowden RM, Casto JM, Paitz RT; Illinois St U* — Deciphering the consequences of yolk testosterone metabolism in birds: Inactivation or modification of an active signal?

P1-124 *Moody TV, Fagan A, Chan E, Mass S, St. John P; SUNY New Paltz* — Quantifying the Rentention of BPA in Regenerating Planaria

P1-125 *Mahoney A, Fuse M; San Francisco State University* — Pupation and Eclosion are Delayed Following Imaginal Disc Damage in Early Instar Larvae in the Hornworm, *Manduca sexta*

P1-126 *Sisti AR, Johnson EL, Earley RL; University of Alabama* — Maternal effects and the mismatch hypothesis: dietary exposure to endocrine disruptors in mangrove rivulus fish

P1-127 *Estrada AD, Wilsterman K, Comizzoli P, Bentley GE; UC Berkeley, Smithsonian Conservation Biology Institute* — Sex steroids alter 3D growth of feline endometrial cells in vitro

P1-128 *Lavin SR, Wheaton CJ, Mylniczenko ND; Disney's Animal Kingdom* — Is a GnRH Vaccine an Effective Contraception Method in Zoo-Managed Mammals?

P1-129 *Mackay SB, Trainor C*, Wilson K, Bergman DA; Grand Valley State University* — Effects of Nonylphenol on Crayfish Molting Hormones

P1-130 *Falso MJS, Shidemantle GI, Pasquale VE, Campbell ZI, Gustafson KL, Marshall LV, Falso PG; Slippery Rock University* — Photographic Examination of Nuptial Pads in *Xenopus laevis* Exposed to the Pesticide Imidacloprid

P1-132 *Lind CM, Agugliaro JA, Moore IT, Vernasco BJ, Farrell TM; Stockton University, Fairleigh Dickinson University, Virginia Tech, Stetson University* — Integrating Metabolic Costs of Infection with Endocrine Indicators of Current Reproductive Investment in Pygmy Rattlesnakes Afflicted with Snake Fungal Disease

Hormones & Behavior

P1-133 *Prater CM, Carr JA; Texas Tech University* — Corticotropin-releasing factor (CRF) does not influence basal or depolarized GABA release from tectal neurons in *Xenopus laevis*

P1-134 *Eshleman MA, Klug PE, Greives TJ; North Dakota State University, USDA-APHIS-WS, NWRC* — Costly Competing Investments: Does Spring Migration Distance Influence the Reproductive Hormones at Arrival to the Breeding Site in a Polygynous Species?

P1-135 *Miner KA, Gabor CR; Texas State University* — Physiology, Behavior and Reproductive Success of (*Gambusia affinis*) Under Artificial Light at Night

P1-137 *Desimone JG, Gutierrez Ramirez M, Breuner CW, Elowe CR, Griego MS, Gerson AR; University of Montana, University of Massachusetts Amherst* — Baseline corticosterone and body composition of Gray Catbirds at stopover during spring migration

P1-138 *Cantu I, Gabor C*; Texas State University* — Effects of Acute and Chronic Predator Stress on Mating and Stress Hormones in Mosquitofish

P1-139 *Winters TJ, Lutterschmidt DI; Portland State University* — Low-temperature winter dormancy alters thyrotropin immunoreactivity in the pituitary pars tuberalis of garter snakes.

P1-140 *Feingold SR, Roark AM; Furman University* — Using the Yeast Estrogen Screen to Measure the Estrogenicity of Personal Care Products

Evolution and Development of Behavior

P1-141 *Ambrose A, Ortiz C, Cordero C, Chmabers C, Markland S, Osborn A, Shirley K, Twombly Ellis J, Tscheulin T, Giray T, Barthell J, Agosto-Rivera J; Savannah State University, University of Puerto Rico, University of Kansas, Oklahoma State University, College of New Jersey, Colorado College, Cornell University, University of the Aegean, University of Central Oklahoma* — The role of circadian rhythms on the temporal organization of foraging behavior in three carpenter bee (*Xylocopa*) species in a Mediterranean Island Ecosystem

P1-142 *Guinness AA, O'Tousa JO; University of Notre Dame Eck Institute for Global Health* — A genetic toolkit for comparative analysis of light-triggered behaviors in mosquito species

P1-143 *Preising GA, O'Rourke C, Renn SCP; Reed College* — Optimization of Cresyl-Stained Brain Micropunch Technique: Investigating the Genetic Regulation of Behavior in *Astatotilapia burtoni*

P1-144 *Reichard DG, Brush JJ, Sorrick MC, Angelo CM, Schultz EM; Ohio Wesleyan University, Kenyon College* — Aggressive behavior and signaling in two species of North American wrens

P1-145 *Solis GM, Husak JF; Univ of St. Thomas* — Effects of arginine vasotocin and mesotocin on aggression in male Caribbean *Anolis* lizards

P1-146 *Payne AA, Horr DM, Johnson MA; Trinity University* — Tail Autotomy in Lizards Not Associated with Tail Use Behaviors or Energy Storage

P1-147 *Blenderman JP, Gumm JM; Stephen F. Austin State University, U.S. Fish and Wildlife, Ash Meadows Fish Conservation Facility* — Personality in the Mantis Shrimp *Neogonodactylus oerstedii*

P1-148 *Irwin SJ, Sanger TJ, Johnson MA; Trinity University, Loyola University* — Social and Exploratory Behaviors of Thermally-Stressed Lizard Hatchlings

P1-149 *Dan M, Giraldo YM, Dickinson MH; California Institute of Technology* — Seasonality in *Drosophila* Sun Navigation

P1-150 *Twombly Ellis JF, Markland S, Ambrose AF, Ortiz Alvarado CA, Gonzales Betancourt VH, Barthell JF, Petanidou TF, Tscheulin T, Abramson CI, Giray T; Cornell University, Oklahoma State University, Savannah State University, University of Puerto Rico, Kansas University, University of Central Oklahoma, University of the Aegean* — Color and Scent as Cues for Reward Association During Honey Bee Foraging

Social Behavior

P1-151 *Giglio EM, Phelps SM; University of Texas at Austin* — Context in courtship: the role of leptin in social investment decisions in singing mice

P1-152 *Horr DM, Ivanov BM, Payne AA, Rouzbehani M, Vega J, Wang H, Johnson MA; Trinity University* — Behavioral Repeatability in the Bark Anole, *Anolis distichus*, Across Social Contexts

P1-153 *Curtis KM, Moore PA, Martin Iii AL; Saginaw Valley State University, Bowling Green State University* — The Effects of Population Structure on Crayfish Aggression

P1-154 *Coonfield AJ, Iyengar VK; Villanova University* — Neighbors, Rivals, and Frenemies: Social Networks in the Maritime Earwig, Anisolabis maritima

P1-155 *Godfrey E, Mullin S, Leese J; DeSales University* — The role of sexual selection in monogamy: exploring behavioral and hormonal mechanisms in a cichlid fish

P1-156 *Cupp PV; Eastern Kentucky University* — Mate-guarding and Pair-bonding Behavior in Green Salamanders, *Aneides aeneus*

P1-157 *MacLeod PF, O'Rourke C, Renn SCP*; Reed College* — Manipulating operational sex ratio to influence female competition and male choice in a lek-like mating system.

P1-158 *Cordero C, Ambrose A, Ortiz C, Petanidou T, Tscheulin T, Giray T, Hranitz J, Barthell J, Gonzalez V, Agosto J; UPR, SSU, Univ of the Aegean, BU, UCO, KU* — The response of circadian rhythms to humidity/temperature oscillations and the foraging patterns of specialist and generalist sweat bees

P1-159	*Guindre-Parker S, Rubenstein DR; University of Guelph, Columbia University*	The physiological costs and fitness benefits of group living trade-off in an unpredictable environment
P1-160	*Woodruff MJ, Hill HM, Noonan M; Indiana University, St. Mary's University, Canisius College*	Individual Difference in the Behavior of Beluga Whales (*Dephinapterus leucas*)
P1-161	*Butler RM, Solomon-Lane TK, Hofmann HA; University of Chicago, University of Texas*	The Development of Social Status in a Highly Social Fish
P1-162	*Kittredge MJ, Hawk A, Meng O, Lamparter M, Thul T, Pask G; Bucknell University*	PiSpy: Affordable Video Rig for Monitoring Animal Behaviors
P1-163	*Faber-Hammond J, O'Rourke C, Renn SCP*; Reed College Biology Department*	Neural gene expression profiles integrating feeding and care circuits in the mouth-brooding African cichlid fish A. burtoni
P1-164	*Toth AJ, Evangelista DE; United States Naval Academy*	Can we redirect a crowd by seeding it with informed leaders?
P1-165	*Kindel M, König B, Lopes PC; Chapman Univ, Univ Zurich*	Can Peripheral Immunity of Healthy Animals Affect Social Behavior?
P1-166	*Slevin MC, Niederhauser JM, Ziadi P, Noonburg EG, Anderson RC; Florida Atlantic University*	Linking territory quality to behavioral syndromes in Bachman's sparrow
P1-167	*Gray CS, Philson CS, Foltz SL, Davis JE; Radford University*	PASSER: Utilizing Neural Networks during Data Collection for Real-time Bird Identification
P1-168	*Ligocki IY, Miller J, Jackson L, Cumbie J, Gil M; University of California, University of Florida, 1984*	Alone or in a group? Territory defense in solitary and group-living dusky damselfish, *Stegastes adustus*.
P1-169	*Waldron J, Kajiura SM; Florida Atlantic University*	Seasonal Abundance and Spatial Distribution of Blacktip Sharks (*Carcharhinus limbatus*) in Southeast Florida
P1-170	*Dakin R, Horton BM, Vernasco BJ, Moore IT, Ryder TB; Smithsonian Institution, Millersville University, Virginia Tech*	Understanding the androgen basis of individual differences in cooperation
P1-171	*Duggan BS, George EM, Rosvall KA; Indiana University*	A low-cost, open-source system to wirelessly collect and manage RFID data
P1-172	*Snekser JL, Diestler E, Wynne RD; LIU Post, St. Thomas Aquinas College*	Sex differences in zebrafish shoaling behavior: Are stress and cortisol the underlying proximate mechanism?
P1-173	*Bockrath RE, Marshall CA, Ghalambor CK; Colorado State University*	The effect of salinity on heterospecific and conspecific aggression in two closely related guppy species, *Poecilia reticulata* and *Poecilia picta*.

Animal Communication

P1-174	*Gumm JM, Imhoff VE, Feller KD; US Fish and Wildlife Service, Stephen F. Austin State University, University of Cambridge, University of Minnesota*	A novel sexually dimorphic, light induced color change in a mantis shrimp, *Coronis scolependra*
P1-175	*Sewall KB, Beck ML; Virginia Tech, Rivier University*	Multimodal signal processing: how do female songbirds prioritize song and plumage cues?
P1-176	*Rodríguez-Saltos CA, Duque FG; Emory University, Georgia State University*	Precise Decrease in the Tempo of the Song of a Tropical Wren
P1-177	*Zhang X, Ronald KL, Hurley LM; Indiana University, Bloomington*	Multimodal Female Stimuli Influence Vocal and Nonvocal Behaviors of Male House Mice (*Mus musculus*)
P1-178	*Humfeld SC, Gerhardt HC; University of Missouri*	Perceptual biases and the evolution of acoustic signals with multiple elements
P1-179	*Sehrsweeney M, Wilson D, Bain M, Boutin S, Humphries MM, Lane JE, McAdam AG, Dantzer B; University of Michigan, Memorial University, University of Guelph, University of Alberta, McGill University, University of Saskatchewan*	Effects of acute stress and glucocorticoids on acoustic structure of territorial vocalizations of North American red squirrels
P1-180	*Crocker-Buta SP, Holloway A, Leary CJ; University of Mississippi, Alcorn State University*	Female Green Treefrogs Prefer the Acoustic Courtship Signals of Unstressed Males
P1-181	*Herrmann MA, Romero-Diaz C, Campos SM, Miter GA, Williams DR, Soini HA, Novotny MV, Hews DK, Martins EP; Arizona State University, Indiana University, Indiana State University*	The Effects of Chemical Signal Content in Social Communication of Lizards
P1-182	*Courts LG, Kittredge MJ, Pask GM; Bucknell University*	Cracking the CHC Code: Olfactory Communication in the Eusocial *Harpegnathos saltator*

P1-183 *Crocker-Buta SP, Leary CJ; University of Mississippi* — Hormonal and Social Correlates of Courtship Signal Quality and Behavior in Male Green Treefrogs

P1-184 *Pellicano A, Azieva G, Lynch KS; Hofstra University* — Eavesdropping on heterospecifics: Does it modify reproductive physiology in female brood parasites

Microbes and Immune Responses

P1-186 *Erickson I, Vollmer AC, Marckel MC, Moody SP, Hiebert SM*; Swarthmore College,* — Gut Microbiota of Sympatric Migratory and Resident Hummingbirds

P1-187 *Webb AC, Lilly N, Wood J, Warren C, Hudson S, French SS; Utah State University* — Interactions of behvaior, temperature, and metabolism in response to an immune challenge in side-blotched lizards, *Uta stansburiana*

P1-188 *King TP, Maruska KP; Louisiana State Univ* — Male social rank influences the immune response in an African cichlid fish

P1-189 *Singh H, Fuse M; San Francisco State University* — Total Hemocyte Populations are Unaffected after X-ray Induced Tissue Damage to Imaginal Discs in the Hornworm, *Manduca sexta*

P1-190 *North HA, Rajamohan A, Bowsher JH; North Dakota State University, Edward T. Shafer Agricultural Research Center, USDA* — Genotoxicity assesment of agrochemicals on honey bee spermatozoa using the TUNEL assay

Complementary to Symposium S2: The Scale of Sickness: how immune variation across space and species affects infectious disease dynamics

P1-191 *Buchanan JL, Kernbach M, Golas B, Johnson PLF, Sweeny AR, Wanelik K; University of Nebraska, Lincoln, University of South Florida, Colorado State University, University of Maryland, College Park, University of Edinburgh, University of Liverpool* — Disentangling health and fitness

P1-192 *Ziemba JL, Lance SL, Capps KA; University of Georgia* — Investigating Potential Ranavirus Reservoirs

P1-193 *Seguel M, Montalva F, Perez-Venegas D, Gutierrez J, Gottdenker N; University of Georgia, Pontificia Universidad Catolixa de Chile, Universidad Andres bello* — Immune mediated hookworm clearance and survival of a marine mammal decreases with warmer ocean temperatures

Coral Reef Biology

P1-194 *Collins MG, Hulsey RD, Smith KM, Childress MJ; Clemson University* — A Tail of Two Territories: Sex Differences in the Territories of Stoplight Parrotfish, *Sparisoma viride*

P1-195 *Stroud CS, Hibberts SJ, Jeanes RC, Smith KM, Childress MJ; Clemson University* — Responses of Transplanted and Natural Coral Colonies to Thermal Stress Events

P1-196 *Fair T, Gardner M, Ingrum I, Noonan K, Childress M; Clemson University* — Effects of Hurricane Irma on reef community structure in the Florida Keys National Marine Sanctuary

P1-197 *Studivan MS, Voss JD; Florida Atlantic University* — Mesophotic-omics: Integrating Transcriptomics, Transplants, & Algal Symbiosis to Understand Coral Adaptation in the Gulf of Mexico

P1-198 *Kim GE, Albright R, Ritson-Williams R; Tufts Univserity, California Academy of Sciences* — Foundational studies of Caribbean crustose coralline algae

P1-199 *Zapfe KL, Frédérich B, Santini F, Federman S, Field D, Dornburg A; Clemson University, University of Liège, Associazione Italiana per lo studio della Biodiversita, Yale University, University of Bath, North Carolina Museum of Natural Sciences* — Collapsing Hotspots, Extinction, and Recovery: The Evolutionary History of Herbivorous Reef Fishes

P1-200 *Connelly MT, McRae C, Liu PJ, Traylor-Knowles N; University of Miami, National Dong-Hwa University* — Patterns of *Pocillopora damicornis* immune gene expression in response to antibiotics treatment, heat stress, and immune stimulation with bacterial lipopolysaccharide

P1-201 *Klepac CN, Barshis DJ; Old Dominion University* — Physiological Evidence of Local Adaptation in the Massive Corals *Porites lobata* and *Goniastrea retiformis* from Ofu Island, American Samoa

Biodiversity

P1-202	*Lobert GT, Collins EE, Mahon AR; Central Michigan University*	Phylogeography and biodiversity of Pycnogonida in the Western Antarctic
P1-203	*Challener RC; Bellarmine University*	Variability in the State of Regenerating Arms of Asteroids in the Waters of Florida
P1-204	*Rodas AM, Wright RM, Buie LK, Aichelman HE, Castillo KD, Davies SW; Boston University, Harvard Medical School, University of North Carolina at Chapel Hill*	Environmental variation and plankton genetic diversity across inshore and offshore coral reefs
P1-205	*Richards JC, Vecchione M; University of North Carolina at Chapel Hill, Smithsonian Institution*	The Diversity and Distribution of Cephalopods in the Charlie-Gibbs Fracture Zone
P1-206	*Pernet B, Silverman ER, Valentich-Scott P; California State University Long Beach, Smith College, Santa Barbara Museum of Natural History*	The seashells of an iconic public artwork: diversity and provenance of the mollusks of the Watts Towers
P1-208	*Shuman JL, Thomas LN, Covi JA; Univ of North Carolina, Wilmington*	The forgotten trophic child: zooplankton and the management of eutrophic lakes
P1-209	*Osborn AL, Ambrose A, Chambers C, Cordero-Martínez C, Shriley K, Silva S, Markland S, Twombly J, Gonzalez V, Tscheulin T, Petanidou T, Barthell JF; College of NJ, Savannah St. U, U Kansas, U Puerto Rico, CO College, OK St. U, Cornell U, U Aegean, U Central OK*	Effect of Pan Trap Size on Catch: Determining Protocol for Pollinator Monitoring
P1-210	*Smoot SC, Zohdy S, Schwartz TS, Wilson AE; Auburn University*	Meta-analysis of publication year and latitude on the Dilution Effect Hypothesis
P1-211	*Patterson LN, Harris BD, Covi JA; Univ of North Carolina at Wilmington*	Tiny, but Mighty! Zooplankton, the Missing Link in Assessments of Ecosystem Health for Waters Near Coal-fired Power Plants
P1-212	*Wicker VV, Borum EM, Bugay MJ, Chebli GY, Pasch HN, Popsuj SE, Root KM, Santiago TE, Sayre GE, Sotelo J, Taylor LEA, Levin II; Agnes Scott College*	Effects of Prescription Grazing on an Urban Forest Fragment Invaded by English Ivy (*Hedera helix*)
P1-213	*Jackson JL, Sloat SA, Rockman MV; New York University*	*Caenorhabditis* nematode diversity in a neotropical rainforest
P1-214	*Urgiles VL, Savage AE; University of Central Florida*	Diversification of terrestrial frogs in a remote high altitude tropical hotspot.
P1-215	*Debiasse MB, Buckenmeyer A*, Babonis LS, Bentlage B, Collins AG, Daly M, Macrander J, Reitzel AM, Stampar SN, Ryan JF; Whitney Lab for Marine Bioscience, University of Guam, Smithsonian Institution, The Ohio State University, Florida Southern College, University of North Carolina at Charlotte, Universidade Estadual Paulista, Whitney Lab for Marine Bioscience*	Placing leaves on the cnidarian tree of life
P1-216	*Sarkis C, Seney EE, Forsman AM; University of Central Florida*	Optimizing NextGen DNA Metabarcoding Methods for Characterizing the Diet of Free-Living Sea Turtles
P1-217	*Ruiz A; California State University*	Quantifying biodiversity temporally across a 15 year period: Biodiversity varies year to year and by seasons in the San Elijo Lagoon
P1-218	*Davis-Berg EC, Rock MO, Ramirez I, Almario-Kopp D, Wilson BA; Columbia College Chicago, University of Illinois at Chicago, Liberty Public Schools*	Fitch Natural History Reservation, a study in molluscan succession in a re-established forest ecosystem

Conservation Biology

P1-219	*Benesh KC, Mahon AR; Central Michigan University*	Impact of Reduced Genomic Datasets on Population Genetic Analysis of SNP Data from the Invasive Grass Carp
P1-220	*Kennedy JGC, Leary CJ; Univ of Mississippi*	The role of reproductive interference and endocrine stress in the decline of native green treefrogs following Cuban treefrog invasions
P1-221	*Watson A, George SB; Georgia Southern University*	Does Shading by Cordgrass Reduce Physiological Stress in RIbbed Mussels in a Local Salt Marsh?
P1-222	*Johnson C, George SB; Georgia Southern University*	Factors Affecting the Facilitative Interaction Between Cordgrass *Spartina alterniflora* and Ribbed Mussels *Geukensia demissa* in Georgia's Salt Marshes

P1-223	*Diaz S, Deangelis D; University of Miami, US Geological Survey*	Development and Validation of a Spatially Explicit Individual-based Model for Simulating Savanna Elephant *(Loxodonta africana)*) Space Use
P1-224	*Adams CIM, Jeunen GJ, Knapp M; Univ of Otago*	Can haplotypes be recovered from environmental DNA?
P1-225	*Nemani SG, Edwards CJ, Hall MW, Martin, Iv WR, Evangelista DJ; United States Naval Academy*	Affordable Unmanned Aerial Systems (UAS), Sensors, Modular Payloads and Algorithmic Tools for Ecological Study
P1-226	*Campos CI, Martinez MA, Russello MA, Wright TF; New Mexico State University, University of British Colombia*	Genetic Structure and Diversity in Wild and Captive Populations of the Critically Endangered Blue-Throated Macaw (*Ara glaucogularis*)
P1-227	*Fahey C, Farady S, Frederich M; University of New England*	Vulnerability of coupled Social-Ecological System (SES) revealed in case study of local management of softshell clam industry
P1-228	*Walters LJ, Kibler KM, Cook G, Chambers L, Donnelly M, Hawthorne T, Rivera F; University of Central Florida*	Integrating sense of place into ecosystem restoration: a novel approach to achieve synergistic social-ecological impact
P1-229	*Plee TA, Pomory CM; University of West Florida*	Sea Cucumbers and Sand Dollars as Biomonitors for Nearshore Environments
P1-230	*Halsey MK, Stuhler JD, Bradley RD, Stevens RD, Ray DA; Texas Tech University*	Opportunistic sampling, model-based clustering and least-cost path analysis aid in identification of connectivity corridors in the Texas Rolling Plains

Symbiosis

P1-232	*Murphy PR, Roark AM; Furman University*	Estrogenicity of Compounds Produced by Anemones and their Algal Symbionts
P1-233	*Twele LR, Moline RE, Middlebrooks ML; University of Tampa*	Phototaxic Behavior Differs Between Kleptoplastic and non-Photosynthetic Sea Slugs
P1-234	*Presnell JS, Weis VM; Oregon State University*	Characterization of Scavenger Receptor and TSR-domain Genes During the Onset and Establishment of Symbiosis in the Sea Anemone *Exaiptasia pallida*
P1-235	*Gass JT, Nishiguchi MK; New Mexico State University*	Zombie bacteria: using natural transformation to study bioluminescence in the *Vibrio fischeri-Euprymna scolopes* symbiosis
P1-236	*Brückner A; Caltech*	Using Weapons Instead of Perfume? - How the Myrmecophilus Bug *Pamillia behrensii* (Miridae) Gets Along With its Host Ant
P1-237	*Tivey TR, Coleman TJ, Weis VM; Oregon State University*	Symbiont-specific recolonization patterns in a cnidarian-algal symbiosis

Cladistics and Phylogenetic Analysis

P1-238	*Smirnoff DS, Gosliner TM; Cal Academy of Sciences*	More Robust Phylogenetic Data Reveal Cryptic Clade and Species Diversity within the Nudibranch Family Goniodorididae
P1-239	*Espinosa AJ, Spagna JC; William Paterson University*	Phylogenetics of Holarctic Agelenine spiders using an augmented barcode strategy
P1-240	*Delgado AL, Daly MA; Portland State University, The Ohio State Univeristy*	Using DDRAD to infer population distribution of Pederson Cleaner shrimp in the Caribbean Oceans
P1-241	*Schammel KS, Mooi R, Armstrong AF; Pomona College, California Academy of Sciences*	Applying molecular data to problems in sand dollar phylogeny (Echinodermata: Clypeasteroida)
P1-242	*Tweeten KA, Ezenagu N; St. Catherine University*	Genetic Analysis Supports Classification of Diploid and Polyploid Populations of *Lumbriculus* as Distinct Species
P1-243	*Whelpley JM, Paulay G, Ryan JF; University of Florida*	Phylogenomic Analysis of Sea Cucumbers: Contextualizing a Unique Echinoderm Across Evolution
P1-244	*Lamon KD, Williams GC; Louisiana State University, California Academy of Sciences*	Molecular Phylogenetics of Pacific Basin Octocorals — from Deep-Sea California to Pacific Coral Reefs
P1-245	*Kawahara AY, Plotkin D, Meusemann K, Toussaint EFA, Espeland M, Donath A, France G, Frandsen P, Zwick A, Barber JR, Misof B, Breinholt J; University of Florida, University of Freiburg, Zoologisches Forschungsmuseum Alexander Koenig, Brigham Young University, Australian National Insect Collection, Boise State University, RAPiD Genomics*	Evolutionary history of butterflies and moths

P1-246	*Pabst E, Kocot KM*; University of Alabama, Tuscaloosa*	Are ultraconserved elements an informative phylogenetic marker for reconstructing deep molluscan phylogeny?
P1-247	*Benedict C, Laroche R, Titus B, Gusmão L, Meyer C, Abdullah ML, Bartholomew A, Daly M, Reimer JD, Yanagi K, Rodríguez E; Auburn University, University of Houston, American Museum of Natural History, National Museum of Natural History, University of Science and Technology, American University of Sharjah, Ohio State University, University of the Ryukyus, Natural History Museum and Institute-Chiba*	Phylogenetic relationships among the clownfish-hosting sea anemones reveals at least four independent origins of the symbiosis
P1-248	*Roqueni MT, Gosliner TM; The Evergreen State College, The California Academy of Sciences*	Discovering Genetic Differences Among Morphologically Similar Thecacera from the Temperate and Tropical Oceans
P1-249	*Dixon G, Kitano J, Kirkpatrick M; University of Texas, National Institute of Genetics, Mishima*	Origin of a new sex chromosome by introgression between sticklebacks
P1-250	*Kay DI, Gignac PM, Erickson GM, O'Brien HD; Oklahoma State University Center for health Sciences, Florida State Univeristy*	Using Simulation Studies to Determine Phylogenetic Effect on the Evolution of Dental Material Properties in Gnathostomes
P1-251	*Awbrey JD, France SC; University of Louisiana at Lafayette*	Evolution of the Octocorallian Family Acanthogorgiidae (Gray 1857)
P1-252	*Nielsen SV; Florida Museum of Natural History*	Multilocus phylogenetics in a widespread African anuran lineage (Brevicipitidae: Breviceps) reveals patterns of diversity reflecting geoclimatic change.
P1-252.5	*Hernandez AM, Ryan JF; Whitney Laboratory for Marine Bioscience, University of Florida*	A comprehensive assessment of 6-state recoding in phylogenetics

Host-Parasite/Host-Pathogen Populations

P1-253	*Nordheim CL, Rice SA, Detmering SE, McMahon TA; The University of Tampa*	Growth Rates and Morphology Found in Four Strains of *Batrachochytrium dendrobatidis* Isolated from Around the World
P1-254	*Jacob S, Bennett S; Mount Holyoke College, California Academy of Sciences*	Dengue, Zika, and Chik, oh my! The evolution of Dengue virus in Nicaragua
P1-255	*Lafond JC, Savage AE; University of Central Florida*	Why won't Bullfrogs Die? A Study of Host Tolerance to Deadly, Fungal Pathogen
P1-256	*Pulver O, Wilcoxen TE, Seitz J, Nuzzo JT; Millikin University, Illinois Raptor Center*	Patterns of Seroprevalence of West Nile Virus in Clinic-Admitted Raptor Species in Central Illinois
P1-257	*Hale E, Zohdy S, Schwartz T; Auburn University*	Detection and Quantification of West Nile, Rift Valley Fever, and Dengue Fever Viruses from Dried Blood Spots to Identify Zoonotic Potential
P1-258	*Walker MA, Asher VJ, Uribasterra MG, Campione AM, Ryan SJ, Blackburn JK; University of Florida, Turner Enterprises*	Ungulate use of locally infectious zones (LIZs) in the re-emerging anthrax zone of Southwestern Montana
P1-259	*Bowen V, McMahon TA, Brosnan EB, Nordheim CL, Fernandez-Denmark S*, Grim JM; University of Tampa*	Tissue-specific changes in catalase activity of amphibian hosts during the time course of chytridiomycosis
P1-260	*Spooner HC, Hernandez GV, Burrin D, Maj MA, Manjarin R, Blank JM; California State University, Baylor College of Medicine*	Intramuscular Lipid Accumulation in a Pig Model of NAFLD
P1-261	*Detmering SE, McMahon TA; University of Tampa*	The Effects of Bd Metabolites on Freshwater Invertebrates
P1-262	*Laggan NA, Joyce L, McMahon TA; The University of Tampa, University of Montana*	Exploring the infection dynamics of *Batrachochytrium dendrobatidis* and soil nematodes: A host parasite system
P1-263	*Shannon RP, Love AC, Bolek MG; Oklahoma State University*	White blood cell differentials of amphibians naturally infected with multiple trypanosome morphotypes
P1-264.5	*Haffner C, Foster P, Anderson SJ, Cowles DL; Walla Walla University*	Are *Pentidotea resecata* Isopods Biting the Hand that Feeds Them? A Study on the Spatial Correlation of Isopod Bite Marks and Wasting Disease on Eelgrass, *Zostera marina*

Evo Morph

P1-265 *Minsky G, Goodheart J, Gonzalez M, Muñoz D, Torres E, Oakley T; UCSB* — Developing The California Sea Firefly (Vargula tsujii) as a laboratory organism to study the genetic basis of species diversification by sexual selection

P1-267 *Burroughs RW; University of Chicago* — Mighty Morphin' Mouse Molars: Identifying Phylogenetic and Developmental Constraints on Rodent Cheekteeth

P1-268 *Labatch NR, Powell CL, Landberg T; Arcadia University* — Effects of ontogeny and sexual dimorphism on jump performance in the Cave Cricket (*Ceuthophilus* spp.)

DVM BSP: Karel F. Liem Award

P1-270 *Rosenbloom JE, Gidmark NJ; Knox College* — Quantifying physiological constraints of prey capture in Centrarchid fishes

P1-271 *Myers CR, Vaz DFB; Mount Holyoke College, College of William and Mary* — Myology of the adhesion disc of Snailfishes (Liparidae: Cyclopteroidea)

P1-272 *Woodring A, Zimmerman M, Landberg T; Arcadia University* — Carry-over effects of larval hydroperiod and conspecific density on the phenotype and urban translocation success of American Toads (*Anaxyrus americanus*)

P1-273 *Marshall SK, Mossor AM, Spainhower KB, Diggins TP, Sinn BT, Butcher MT; YSU* — Phylogenetic and funtional evaluation of Xenarthran hindlimb structure

P1-274 *Weller HI, Cohen KE, Kaczmarek E, Gibb A, Brainerd EL; Brown University, University of Washington, Northern Arizona University* — Using Tethers to Measure Food Transport in a Flatfish

P1-275 *Chabain JJ, Summers AP, Kolmann MA; Friday Harbor Laboratory, University of Washington, George Washington University* — What's The Point? Form and Function of the Caudal Barb in Stingrays

P1-276 *Huie JM, Summers AP, Kolmann MA; University of Washington, George Washington University* — Body shape and feeding morphology explain ecological differences in riverine herbivorous fishes

P1-277 *Melstrom KM, Wistort ZP; University of Utah* — Quantification conundrum: Just how repeatable are dental complexity measurement methods?

P1-278 *Roberts AS, Donatelli CM; University of California, Davis, Tufts University* — Fish Motion in the Ocean: Predicting Swimming Kinematics from Vertebral Morphology

P1-279 *Anable N, Gibb A, Minicozzi M; Northern Arizona University* — Kinematics of Burying Behavior in the Pacific Staghorn Sculpin

P1-280 *Koluch MP, Burton K, Ohrenberger J, Farina S, Gidmark NJ; Knox College, Univ of New Hampshire, Howard University* — Biomechanical and histological explorations of bendable tooth attachments in goosefish

P1-281 *McGrath SC, Geisinger R, Carty W, Scott K, Moore G, Landberg T; Arcadia University, Alfred University* — Effects of Farming Practices and Animal Husbandry on Bone China Quality

P1-282 *Singh A, Keeffe R, Blackburn D; University of Florida* — Tips and Fits: Tricks to 3D Puzzle Making

P1-283 *Boggs TE, Powers AK, Gross JB; University of Cincinnati* — Canal Neuromasts Influence the Development and Position of Suborbital Bones in the Blind Mexican Cavefish, *Astyanax mexicanus*

P1-284 *Abels JR, Richardson SS, Bird NC; Univ of Northern Iowa* — Histological Anatomy and Structural Integration in Four Distinct Cypriniform Weberian Apparatus Morphologies

P1-285 *Narducci RE, Hulbert RC, Bourque JR, Bloch JI; University of Florida* — Cranial Armor of the Pleistocene Pampathere *Holmesina* (Xenarthra, Cingulata, Pampatheriidae)

P1-286 *Vitek NS, Morse PE, Strait SG, Boyer DM, Bloch JI; University of Florida, Duke University, Marshall University, Florida Museum of Natural History* — Changes in relative molar size in the small-bodied mammal *Macrocranion* across the Paleocene-Eocene Thermal Maximum follow predictions of nutritional deficit

DCB BSP: Steven Vogel Award

P1-287 *Shishkov O, Johnson C, Hu M, Hu DL; Georgia Institute of Technology* — Feeding Fly Larvae Form a Fountain

P1-288 *Cellini BO, Mongeau JM; Penn State University* — Decoding the Algorithms for Head and Body Coordination during Visually Guided Flight

P1-289 *Wainwright DK, Lauder GV; Harvard University* — The structure and hydrodynamic function of tuna keels

DEE BSP

P1-290	*McCann M, Lattanzio M; Christopher Newport Univ*	Sex Differences in the Response to Recent Climate Change by a Sexually-Dimorphic Species
P1-291	*Furr D, Ketchum RN, Reitzel A, Ivanina AV; Univ of North Carolina, Charlotte*	Genetic and Environmental Determinants of Stress Tolerance Among the Eastern Oyster Population
P1-292	*Gordon KE, McCoy MW; East Carolina University*	How Temperature, Resource Input, and Standing Genetic Variation Affect Predator Responses of *Physa acuta*
P1-293	*Abraham JO, Staver AC; Yale University*	Drought-Response Strategies of Savanna Herbivores
P1-294	*Thompson MC, Feng H, Wuchty S, Wilson ACC; University of Miami*	Evidence of Plant-encoded miRNAs in Green Peach Aphid (*Myzus persicae*) Gut
P1-295	*Schaale LE, Baxley JB, Pricope NG, Danner RM; Univ of North Carolina, Wilmington*	Viewing habitat through another lens: Bird nest-site selection and productivity across the beach thermal landscape
P1-296	*Idec JH, Fisher BL; Hendrix College, California Academy of Sciences*	Characterizing Color Diversity in Ants Using Databases and Image Analysis

Saturday Schedule of Events

Events take place in the Tampa Convention Center, unless otherwise noted

EVENT	TIME	LOCATION
Poster Session 2 Set Up	7:00 AM – 8:00 AM	Exhibit Hall
Speaker Ready Room	7:00 AM – 5:00 PM	Room 11
Registration	7:30 AM – 4:00 PM	Central Exhibit Hall
Coffee Break AM	9:30 AM – 10:30 AM	Exhibit Hall
Exhibit Hall	9:30 AM – 5:30 PM	Exhibit Hall
Coffee Break PM	3:30 PM – 4:30 PM	Exhibit Hall
Poster Session 2 Even Numbers Authors Present	3:30 PM – 4:30 PM	Exhibit Hall
Poster Session 2 Odd Numbers Authors Present	4:30 PM – 5:30 PM	Exhibit Hall
Poster Session 2 Teardown	5:30 PM – 6:00 PM	Exhibit Hall
SPECIAL LECTURE		
AMS Lecture: Dr. Bruce Conn Functional Morphology Meets Infectious Disease Epidemiology: How Parasitic Flatworms Move Between and Within Hosts	7:00 PM – 8:00 PM	Room 12 & 13
Bern Lecture: Dr. Michael Romero Scared, Cold, and Hungry – Stress from the Arctic to the Equator	7:00 PM – 8:00 PM	Room 14-17
SYMPOSIA ORAL PRESENTATIONS		
S4: Adaptation and Evolution of Biological Materials Chairs: Rob Campbell, Mason Dean	7:50 AM – 3:30 PM	Room 16 & 17
S5: Stress Phenotype: Linking Molecular, Cellular, and Physiological Stress Responses to Fitness Chairs: Haruka Wada, Britt Heidinger	7:50 AM – 3:00 PM	Room 18
S6: Beyond the Powerhouse: Integrating Mitonuclear Evolution, Physiology, and Theory in Comparative Biology Chairs: Justin Havird, Geoffrey Hill	8:00 AM – 3:30 PM	Room 19
CONTRIBUTED PAPER ORAL PRESENTATIONS		
MORNING		
Session 37: Rising Star in Organismal Botany Award	8:00 AM – 10:00 AM	Room 1 & 2
Session 38: Evolutionary Morphology	8:00 AM – 9:45 AM	Room 3 & 4
Session 39: Host Pathogen Interactions	8:00 AM – 9:15 AM	Room 5 & 6
Session 40: Social Behavior and Predator-Prey Interactions	8:00 AM – 10:00 AM	Room 13
Session 41: Slytherin Snakes	8:00 AM – 9:30 AM	Room 14 & 15
Session 42: Complementary to S3: Playing with Power: Mechanisms of Energy Flow in Organismal Movement	8:00 AM – 9:15 AM	Room 20
Session 43: Complementary to S2: The Scale of Sickness: How Immune Variation Across Space and Species Affects Infectious Disease Dynamics	8:00 AM – 9:45 AM	Room 21
Session 44: Phenotypic Plasticity	8:00 AM – 9:45 AM	Room 22
Session 45: Method to Madness	8:00 AM – 9:45 AM	Room 23
Session 46: Evolution of Form and Function	8:00 AM – 9:45 AM	Room 24
Session 47: Neurobiology and Sensory Biology	8:00 AM – 9:45 AM	Room 25
Session 48: Communication and Cognition	8:00 AM – 9:45 AM	Room 12
Session 49: Savin' the Seeds of Life - Conservation Biology	10:30 AM – 12:00 PM	Room 1 & 2
Session 50: Phylogenetics and Paleobiology	10:15 AM – 11:45 AM	Room 3 & 4
Session 51: Bigger and Better? Endocrine Aspects of Growth and Development	10:15 AM – 12:00 PM	Room 5 & 6
Session 52: Reproductive and Social Behavior	10:15 AM – 11:30 AM	Room 13
Session 53: DCB Best Student Paper: Mimi A.R. Koehl and Steven Wainwright Award	10:00 AM – 12:00 PM	Room 14 & 15
Session 54: Smellin' and Livin' Together - Chemical and Community Ecology	10:00 AM – 11:45 AM	Room 20

Session 55: Doin' it with the Dinoflagellates - Coral Reef Biology	10:00 AM – 11:15 AM	Room 22
Session 56: Immunity, Inflammation, and Toxicology	10:00 AM – 12:00 PM	Room 23
Session 57: DEDB Best Student Paper	10:00 AM – 11:45 AM	Room 24
Session 58: Vision	10:15 AM – 12:00 PM	Room 25
Session 59: Chemosensory	10:15 AM – 12:00 PM	Room 12

AFTERNOON

Session 60: Complementary to S1: Integrative Plant Biology	1:30 PM – 3:30 PM	Room 1 & 2
Session 61: Macroevolution	1:30 PM – 3:15 PM	Room 3 & 4
Session 62: Sickness and the Microbiome	1:30 PM – 3:15 PM	Room 5 & 6
Session 63: Neuroanatomy	1:30 PM – 3:30 PM	Room 13
Session 64: Robot Overlords	1:30 PM – 3:30 PM	Room 14 & 15
Session 65: Complementary to S3: Playing with Power: Mechanisms of Energy Flow in Organismal Movement	1:30 PM – 3:00 PM	Room 20
Session 66: Care for the Planet - Conservation Biology & Community Ecology	1:30 PM – 3:15 PM	Room 21
Session 67: Morphology and Mechanics Through Time	1:30 PM – 3:15 PM	Room 22
Session 68: Muscle Physiology, I	1:30 PM – 3:30 PM	Room 23
Session 69: Ecomorphology	1:30 PM – 3:15 PM	Room 24
Session 70: Vertebrate Development and Evolution	1:30 PM – 3:30 PM	Room 25
Session 71: Sensory Biology	1:30 PM – 3:30 PM	Room 12

COMMITTEE AND BOARD MEETINGS

Advisory Committee	7:00AM – 8:00AM	Room 31
SICB Division Secretaries	12:00PM – 1:30PM	Room 31
Broadening Participation Committee Meeting	12:00 PM – 1:30 PM	Room 30B
Educational Council	12:00PM – 1:30PM	Room 34
Student/Postdoc Affairs Committee	12:00PM – 1:30PM	Room 8
Membership Committee	12:00PM – 1:30PM	Room 32
Editorial Board Meeting JEZ Part A: Ecological and Integrative Physiology	12:00PM – 1:30PM	Room 7

BUSINESS MEETINGS

TCS Business Meeting	12:00 PM – 1:30 PM	Room 3 & 4
AMS Business Meeting	12:00 PM – 1:30 PM	Room 1 & 2
DCE Meeting	5:45 PM – 6:30 PM	Room 18
DCB Meeting	5:45 PM – 6:30 PM	Room 19
DIZ Meeting	5:45 PM – 6:30 PM	Room 20
DPCB Meeting	5:45 PM – 6:30 PM	Room 21

WORKSHOPS AND PROGRAMS

500 Women Scientists Meetup: A discussion about making science open, inclusive, and accessible. All are welcome to attend.	12:00 pm – 1:30 pm	Room 3-4
Workshop: "Mastering materials imaging: pushing boundaries in SEM and x-ray tomography"	12:00 pm – 1:30 pm	Room 16-17
Public Affairs Committee Workshop: The art of persuasive communication when acting meets science	12:00 pm – 1:30 pm	Room 13
NSF Program Officers: Revisions to the IOS core program and Q&A	12:00 PM – 1:30 PM	Room 14-15
Sketchnotes: A hands-on visual note-taking workshop	12:00 PM – 1:30 PM	Room 5-6
AMIRA/Avizo Workshop: Digital volume correlation for volumetric characterization of biomechanical changes	3:30 PM – 4:30 PM	Room 16-17
DPCB Ask-An-Expert: Get phylogenetic and comparative methods support with an expert	3:30 PM – 5:30 PM	Central Exhibit Hall

SOCIAL EVENTS

Botany at SICB Organizational Meeting and Social	12:00 PM – 1:30 PM	Room 30A
Libbie Hyman Auction & TCS/DEDB/DPCB/AMS/DIZ/DEE Social	7:30 PM – 9:00 PM	Il Terrazzo, Marriott
DCE/DEDE/DAB/DNNSB Social	8:00 PM – 10:00 PM	The Landing, 2nd Floor
DVM/DCB Social	9:00 PM – 12:00 AM	American Social (Offsite)

Saturday Program Symposia

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

7:50 AM – 3:30 PM **Symposium S4** **Room 16 & 17**

Adaptation and Evolution of Biological Materials

Chairs: Rob Campbell, Mason Dean

7:50 am	**S4-1**	*Campbell RA, Dean MN; Okinawa Institute of Science and Technology, Max Planck Institute for Colloids and Interfaces*	Adaptation and Evolution of Biological Materials
8:00 am	**S4-2**	*Hu DL; Georgia Tech*	How ants behave like a fluid and a solid
8:30 am	**S4-3**	*Mortimer B; Univ of Oxford*	Vibration Landscapes: the Role of Materials in Vibrational Information Transfer
9:00 am	**S4-4**	*Bagge LE, Kinsey ST, Kier WM, Johnsen S; Duke, Univ of NC Wilmington, Univ of NC at Chapel Hill*	Clearly Camouflaged: Ultrastructural Modifications in Transparent Animals
9:30 am	**Coffee Break**		**Exhibit Hall**
10:00 am	**S4-5**	*Aydin YO, Culver J, Tennenbaum M, Goldman DI, Bhamla MS*; Georgia Institute of Technology*	Dynamics of a worm blob
10:30 am	**S4-6**	*Joel AC, Weissbach M; RWTH Aachen University, Johannes Gutenberg University Mainz*	Same Principles but Different Purposes: Passive Fluid Handling Throughout the Animal Kingdom
11:00 am	**S4-7**	*Seago AS; NSW Department of Primary Industries*	The Evolution of Photonic Crystals in Beetles
11:30 am	**S4-8**	*Van Casteren Adam, Crofts S; Washington University in Saint Louis, University of Illinois at Urbana-Champaign*	Biomaterials to structure: exploring the interplay between tooth materials, structure, and function
12:00 pm	**Lunch Break**		
1:30 pm	**S4-9**	*Baum D, Knötel D, Dean MN; Zuse Institute Berlin, Max Planck Institute of Colloids and Interfaces*	Shape models for image segmentation and geometric analysis of biological structures
2:00 pm	**S4-10**	*Stoddard MC, Ling L, Weaver JC; Princeton University, Virginia Polytechnic Institute and State University, Wyss Institute for Biologically Inspired Engineering at Harvard*	The Avian Egg: A Marvel of Evolution and Engineering
2:30 pm	**S4-11**	*Hesse L, Masselter T, Leupold J, Bunk K, Speck T; University of Freiburg*	Biomechanics and development of plant branch-stem-attachments as inspiration for optimized fiber-reinforced anchors
3:00 pm	**S4-12**	*Baer A, Schmidt S, Mayer G, Harrington MJ*; University of Kassel, Heinrich-Heine-Universität, McGill University*	Fibers on the Fly: Multiscale Mechanisms of Fiber Formation in the Capture Slime of Onychophorans
3:30 pm	**Coffee Break**		**Exhibit Hall**

7:50 AM – 3:00 PM **Symposium S5** **Room 18**

Stress Phenotype: Linking Molecular, Cellular, and Physiological Stress Responses to Fitness

Chairs: Haruka Wada, Britt Heidinger

7:50 am	**S5-1**	*Heidinger B, Wada H; North Dakota State University, Auburn University*	A brief introduction to the symposium
8:00 am	**S5-2**	*Romero ML; Tufts University*	How Truly Conserved is the 'Well-Conserved' Vertebrate Stress Response?

8:30 am	**S5-3**	*Dantzer B, Westrick SE, Monaghan P, Haussmann M, Boutin S, Humphries MM, Lane JE, McAdam AG, Van Kesteren F; University of Michigan, University of Glasgow, Bucknell University, University of Alberta, McGill University, University of Saskatchewan, University of Guelph*	Maternal glucocorticoids alter a network of offspring traits in red squirrels but are these changes adaptive?
9:00 am	**S5-4**	*Kelly M, Sirovy K, Lapeyre J; Louisiana State University*	What doesn't bend: Environmentally responsive gene expression and measures of fitness in natural populations of the eastern oyster, Crassostrea virginica
9:30 am		**Coffee Break**	**Exhibit Hall**
10:00 am	**S5-5**	*Breuner CW, Berk SA; The University of Montana*	Links between glucocorticoids and fitness; three hypotheses, lots of data and 10 years later: what do we know, what's next?
10:30 am	**S5-6**	*Wada H; Auburn University*	Damage-fitness model: Integrating stress physiology models
11:00 am	**S5-7**	*Rubenstein DR; Columbia University*	Epigenetic mechanisms for plasticity in coping with environmental change
11:30 am	**S5-8**	*Vitousek MN, Taff CC, Zimmer C, Ardia DR; Cornell University, Franklin and Marshall College*	Stress and success: The role of variation in the efficacy of negative feedback in the glucocorticoid stress response
12:00 pm		**Lunch Break**	
1:30 pm	**S5-9**	*Bowsher J; North Dakota State University*	Protective Mechanisms During Low Temperature Stress in a Solitary Bee
2:00 pm	**S5-10**	*Schwartz TS; Auburn University*	Using Transcriptomics to Further our Understanding of the Divergent Effects of Stressors on Physiology, Life History and Fitness
2:30 pm	**S5-11**		Roundtable Discussion
3:00 pm		**Coffee Break**	**Exhibit Hall**

8:00 AM – 3:30 PM Symposium S6 Room 19

Beyond the Powerhouse: Integrating Mitonuclear Evolution, Physiology, and Theory in Comparative Biology

Chairs: Justin Havird, Geoffrey Hill

8:00 am	**S6-1**	*Dowling DK; Monash University*	Maternal inheritance of mitochondria, and implications for male health
8:30 am	**S6-2**	*Jimenez AG, Anderson K, O'Connor E, Tobin K, Winward J, Winner R, Chinchilli E, Amy M, Carlson K, Downs CJ; Colgate University, Hamilton College*	Does Oxidative Stress Differ Between Mammals and Birds?
9:00 am	**S6-3**	*Greenway R, Havird JC, Kelley JL, Tobler M; Kansas State University, University of Texas at Austin, Washington State University*	The role of mitonuclear incompatibilities during ecological speciation in extremophile poeciliid fishes
9:30 am	**S6-4**	*Sokolova Inna; University of Rostock*	Mitochondrial adaptations to fluctuating oxygen levels in hypoxia-tolerant marine bivalves
10:00 am		**Coffee Break**	**Exhibit Hall**
10:30 am	**S6-5**	*Havird JC; Univ of Texas, Austin*	Mitonuclear Ecophysiology: The Cooperative Genomics of Environmental Adaptation
11:00 am	**S6-6**	*Watson EricT, Edmands S; University of Southern California*	Mitonuclear coevolution and the genetics of speciation in *Tigriopus californicus.*
11:30 am	**S6-7**	*Hill GE; Auburn University*	Speciation and Sexual Selection as Processes to Maintain Mitonuclear Coadapation
12:00 pm		**Lunch Break**	

1:30 pm	**S6-8**	*Montooth KL, Dhawanjewar A, Meiklejohn CD; University of Nebraska-Lincoln*	Temperature-sensitive reproduction and the physiological and evolutionary potential for Mother's Curse
2:00 pm	**S6-9**	*Hood W, Williams A, Hill G; Auburn University*	Mitochondrial Replication Error and Senescence
2:30 pm	**S6-10**	*Wernick RI, Christy SF, Howe DK, Sullins JA, Ramirez JF, Sare M, Penley MJ, Morran LT, Denver DR, Estes S*; Oregon State University, Portland State University, Emory University*	Sex and mitonuclear adaptation in experimental *C. elegans* populations
3:00 pm	**S6-11**	*Healy TM, McKenzie JL, Chung DJ, Brennan RS, Whitehead A, Schulte PM*; University of British Columbia, University of California, Davis*	Mitochondrial physiology, mitonuclear interactions, and adaptation to environmental stressors

3:30 pm ..... **Coffee Break** ..... **Exhibit Hall**

Saturday Program Morning Sessions

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

8:00 AM – 10:00 AM **Session 37** **Room 1 & 2**

Rising Star in Organismal Botany Award

Chair: Stacey Smith

8:00 am	**37-1**	*Cai L, Xi Z, Amorim AM, Sugumaran M, Rest JS, Liu L, Davis CC; Harvard University, Universidade Estadual de Santa Cruz, Univ of Malaya, Stony Brook Univ, Univ of Georgia*	Thrive with Additional Sets of Genome: Widespread Paleopolyploidization Buffers plants Through Eocene Climatic Upheaval
8:15 am	**37-2**	*Jones M, Nagalingum N; California Academy of Sciences*	Phylogenetics of grammitids (Grammitidoideae): Using molecular data and morphological characters to identify Peninsular Malaysian ferns
8:30 am	**37-3**	*Howard CC, Landis JB, Folk R, Beaulieu JM, Cellinese N; University of Florida, University of Riverside, Florida Museum of Natural History, University of Arkansas*	Digging for answers: the causes and consequences of geophytism in the monocots
8:45 am	**37-4**	*Furze ME, Huggett BA, Aubrecht DM, Stolz CD, Carbone MS, Richardson AD; Harvard University, Bates College, Northern Arizona University*	Understanding Nonstructural Carbohydrate Storage and Seasonal Dynamics at the Whole-tree Level
9:00 am	**37-5**	*Westermeier A, Sachse R, Poppinga S, Körner A, Born L, Mader A, Bischoff M, Gresser GT, Knippers J, Speck T; University of Freiburg, University of Stuttgart*	Biology, biomechanics and biomimetic potential of *Aldrovanda vesiculosa* underwater snap-traps
9:15 am	**37-6**	*Jorge JF, Harrison JS, Manos PS, Patek SN; Duke University*	Biomechanics of ballistic seed dispersal in the witch hazel (*Hamamelis*)
9:30 am	**37-7**	*Moeglein MK, Park B, Cacho NI, Olson ME, Eaton DA, Donoghue MJ, Edwards EJ; Yale University, National Autonomous University of Mexico, Columbia University*	Leaf Trait Evolution in *Viburnum*
9:45 am	**37-8**	*Swafford AJM, Oakley TH; UC Santa Barbara*	Insights into Early Sensory Evolution from Sensorimotor Systems in Unicellular Zoospores of a Fungus

10:00 am ..... **Coffee Break** ..... **Exhibit Hall**

8:00 AM – 9:45 AM **Session 38** **Room 3 & 4**

Evolutionary Morphology

Chairs: Andrew Conith, Anthony Herrel

8:00 am	**38-1**	*Hall KC, Hundt PJ, Swenson JD, Summers AP, Crow KD; University of Washington, University of Massachusetts Amherst, San Francisco State University*	The Evolution of Underwater Flight in Manta Rays and Their Relatives (Myliobatidae)

8:15 am	**38-2**	*Taverne M, Fabre AC, Dutel H, Tadic Z, Fagan M, Herrel A; Muséum National d'Histoire Naturelle, Natural History Museum, School of Engineering, Hull, Zagreb*	Phenotypic diversification in insular populations of *Podarcis* lizards: how do diet and bite force drive variation in skull morphology?
8:30 am	**38-3**	*Gusmão LC, Grajales A, Rodríguez E; American Museum of Natural History, Universidade de los Andes*	Sea Anemones Through X-rays: Utility of Micro-computed Tomography (Micro-CT) for the taxonomy and systematics of the group
8:45 am	**38-4**	*Herrel A, Orpel J, Padilla P, Courant J, Rebelo R; UMR719 CNRS/MNHN, Faculdade de Ciências da Universidade de Lisboa*	Do invasive populations of Xenopus laevis living in different environments differ in morphology?
9:00 am	**38-5**	*Perez-Guerra D, Garduño-Paz MV, Mendez-Sanchez JF, Adams CE; Midwestern State University, Universidad Autónoma del Estado de México, Glasgow University*	Morphological plasticity in *Girardinichthys multiradiatus*: a high-altitude fish endemic to Upper Lerma, Mexico
9:15 am	**38-6**	*Conith AJ, Lam DT, Albertson RC; Univ of Massachusetts Amherst*	Muscle-Induced Loading as a Major Source of Variation in Craniofacial Skeletal Shape
9:30 am	**38-7**	*Zelditch ML, Li J, Swiderski DL; Univ of Michigan, Univ of Colorado*	Stasis of Functionally Versatile Specialists
9:45 am		**Coffee Break**	**Exhibit Hall**

8:00 AM – 9:15 AM **Session 39** **Room 5 & 6**

Host Pathogen Interactions

Chair: Laura Zimmerman

8:00 am	**39-1**	*Clissold FJ, Woodman JD, Wilson K, Simpson SJ; The University of Sydney, Department of Agriculture and Water Resources, Lancaster University*	The interactive impact of temperature and nutrition on disease resistance
8:15 am	**39-2**	*Fassbinder-Orth C, Hughes S, Sabotin R, Push G, Tran T; Creighton University*	Honey Bees in Peril: An Investigation of Honey Bee Viral Infection Dynamics
8:30 am	**39-3**	*Gajewski ZJ, Stevenson LA, Pike D, Roznik EA, Johnson L; Virginia Tech, Northern Australia Quarantine Strategy, Rhodes College, Memphis Zoo*	Varying temperature effects on the growth of the amphibian chytrid fungus
8:45 am	**39-5**	*Balenger SL; Univ of Mississippi*	Costs associated with *Mycoplasma gallisepticum* infection of Eastern Bluebirds (*Sialia sialis*)
9:00 am	**39-6**	*Gray WA, Sunnucks E, Huber T, Zimmerman LM*; Millikin University, Towson University*	Natural Antibody Abundance But Not Avidity Predicts *Salmonella* Infection in a Reptile
9:15 am		**Coffee Break**	**Exhibit Hall**

8:00 AM – 10:00 AM **Session 40** **Room 13**

Social Behavior and Predator-Prey Interactions

Chair: Roslyn Dakin

8:00 am	**40-1**	*Dakin R, Ryder TB; Smithsonian Institution*	Dynamic Network Partnerships and Social Contagion Drive Cooperation
8:15 am	**40-2**	*Philson CS, Foltz SL, Davis JE; Radford University*	Plasticity in Songbird's Environment-Behavior Interactions at a Supplemental Feeder
8:30 am	**40-3**	*Hill GM, Trager M, Lucky A, Daniels JC; University of Florida, Gainesville, US Forest Service, National Forests*	Uncovering the benefits of an ant-butterfly mutualism in the Florida Keys
8:45 am	**40-4**	*Ferguson SM, Barr JI, Bateman PW; Kalamazoo College, Curtin University*	Silver gull flight initiation distance varies with human predictability, not habituation
9:00 am	**40-5**	*Rogers DC; University of Kansas*	Predatory Anostracans Alter Growth of Prey Anostracans (Crustacea: Branchiopoda)
9:15 am	**40-6**	*McKee AA, McHenry MJ; Univ of California, Irvine*	How zebrafish use visual cues to evade predation
9:30 am	**40-7**	*Peterson AN, McHenry MJ; Univ of California, Irvine*	The Coupled Strategies of Lionfish and Prey Fish

9:45 am	**40-8**	*Bade LM, Scherr MP, Angelini DR; Colby College*	'What's for Dinner?' Use of high-throughput sequencing to illuminate cownose ray feeding ecology and diet composition.

10:00 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:30 AM **Session 41** **Room 14 & 15**

Slytherin Snakes

Chair: Perrin Schiebel

8:00 am	**41-1**	*Diaz K, Schiebel PE, Ding JL, Lu H, Goldman DI; Georgia Tech*	Undulatory Locomotion in Heterogeneous Environments Across Scales
8:15 am	**41-2**	*Jurestovsky DJ, Astley HC; Univ of Akron, Ohio*	The Effect of the Zygosphene/Zygantrum Joint on the Range of Motion in Snake Vertebrae
8:30 am	**41-3**	*Socha JJ, Hernandez P, Ossenkopp S, Graham M, Zamore S; Virginia Tech, William Fleming High School*	Tongue-sticking: A static tongue flick in flying snakes
8:45 am	**41-4**	*Gart SW, Fu Q, Mitchel TW, Li C*; Johns Hopkins University*	Snakes partition their body to traverse large steps and inspire a snake robot
9:00 am	**41-5**	*Fu Q, Li C; Johns Hopkins University*	Body compliance helps snakes traverse large step obstacles
9:15 am	**41-6**	*Schiebel PE, Rieser JM, Astley HC, Hubbard AM, Diaz K, Goldman DI; Georgia Institute of Technology*	Mechanics of Snake Slithering on Deformable Substrates.

9:30 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:15 AM **Session 42** **Room 20**

Complementary to S3: Playing with Power: Mechanisms of Energy Flow in Organismal Movement

Chair: Manny Azizi

8:00 am	**42-1**	*Isaacs MR, Lee DV; University of Nevada, Las Vegas*	Mechanical Cost Dynamics of Single and Double Stance in Human Walking
8:15 am	**42-2**	*Mendoza E, Azizi E, Moen DS; Oklahoma State University, University of California, Irvine*	The Diversity and Evolution of Jumping Power in Anurans
8:30 am	**42-3**	*Gibson JC, Suarez AV; University of Illinois*	Deadly Jaws: Functional Morphology and Strike Kinematics of *Acanthognathus* Trap-Jaw Ants
8:45 am	**42-4**	*Rogers DD, Perlman BM, Azizi E, Lappin AK; California State Polytechnic Univ, Pomona, Univ of California, Irvine*	Effects of Temperature on Dragonfly Nymph Prey-Strike Performance
9:00 am	**42-5**	*Jankauski MA; Montana State University*	Experimental Studies of Power, Moments and Energetics in Flapping, Flexible Insect Wings

9:15 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:45 AM **Session 43** **Room 21**

Complementary to S2: The Scale of Sickness: How Immune Variation Across Space and Species Affects Infectious Disease Dynamics

Chairs: Daniel Becker, Amberleigh Henschen

8:00 am	**43-1**	*Moore MS, Bure CM, Patrose RP, Rasheed AR, Boone BM, Knight JK, Poterewicz GM, Gross VS, Russell AL, Dávalos LM; Arizona State University, Stony Brook University, Pressure BioSciences, Inc., Grand Valley State University*	Analyzing the Proteomes of Bat Wing Biopsies to Uncover Characteristics of Resistance to White-Nose Syndrome
8:15 am	**43-2**	*Savage AE, Trujillo A, Hoffman EA; University of Central Florida*	Spatiotemporal phylogeography of immune genes in the frog-fungus disease system
8:30 am	**43-3**	*Tyler Rollman B, Troy Rowan, Ben Ryan, Carol Fassbinder-Orth ; Creighton University*	Buggy Creek virus Dynamics within Swallow Bugs (*Oeciacus vicarious*)
8:45 am	**43-4**	*Hite JL, Cressler CE; University of Nebraska-Lincoln*	The evolutionary, epidemiological, and ecological consequences of parasite-mediated anorexia

9:00 am	**43-5**	*Leon AE, Hawley DM; Virginia Tech*	Host immunity and selection on pathogen virulence in a songbird-bacterium system
9:15 am	**43-6**	*Henschen AE, Adelman JS; Iowa State Univ*	Investigating the evolution of tolerance in a wild songbird
9:30 am	**43-7**	*Albery GF, Kenyon F, Becker DJ, Nussey DH, Pemberton JM; University of Edinburgh, Moredun Research Institute, Montana State University*	The Landscape of Immunity in a Wild Ungulate Population
9:45 am		**Coffee Break**	**Exhibit Hall**

8:00 AM – 9:45 AM **Session 44** **Room 22**

Phenotypic Plasticity

Chair: Jeanette Wyneken

8:00 am	**44-1**	*Shephard AM, Snell-Rood EC; Univ of Minnesota*	Costs of adaptive plastic responses to stressors: genetic variation in hormetic responses to heavy metals in a butterfly
8:15 am	**44-2**	*Fenner JL, Counterman BA; Mississippi State University*	A Tale of Two Colors: How Structural and Pigmented Wing Colors Share a Developmental Mechanism in the Seasonally Polyphenetic Southern Dogface Butterfly
8:30 am	**44-3**	*Darcy HE, Anderson PSJ; University of Illinois Urbana-Champaign*	Quantifying Phenotypic Variation in a Tooth-Bearing Bone in Spelerpinae Salamanders
8:45 am	**44-4**	*Wyneken J, Lolavar A, Lasala J; Florida Atlantic Univ*	Lethal Phenotypes and Cryptic Consequences from Extreme Developmental Conditions in Sea Turtles
9:00 am	**44-5**	*Louis LD, Keaveny TM, Bentley GE, Dudley R; Univ of California, Berkeley*	Influence of laying an egg on bird bone
9:15 am	**44-6**	*Mills KK, Bowling BC, Gunderson AM, Olson LE; University of Alaska*	Why Are Some Marmots Black? The Genetics and Persistence of a Seemingly Harmful Trait in the North American Marmots
9:30 am	**44-7**	*Foquet B, Song H; Texas A&M University*	A comparative study of behavioral, morphological, and molecular reaction norms of locust phase polyphenism
9:45 am		**Coffee Break**	**Exhibit Hall**

8:00 AM – 9:45 AM **Session 45** **Room 23**

Method to Madness

Chair: Suzanne Cox

8:00 am	**45-1**	*Dresch JM, Gaiewski M, Drewell RA; Clark University*	Improving Evolutionary Algorithms for Parameter Estimation
8:15 am	**45-2**	*Fiedler K, Cooper WJ*; Washington State Univ*	An automated method for collecting biomechanical data from high-speed videos of fish feeding
8:30 am	**45-3**	*Murphy C, Daily D, Marx M, Lapseritis J, Neimeyer M, Johnston E, Guarendi A, Moore M; Naval Undersea Warfare Center, New England Aquarium, International Fund for Animal Welfare, Woods Hole Oceanographic Institution*	A Photogrammetric Method for Modeling Body Form in Stranded Large Whales
8:45 am	**45-4**	*Hall AS; Thermo Fisher Scientific*	Segmentation and Meshing for Biomechanical Finite Element Analysis
9:00 am	**45-5**	*Cox SM, Rubenson J; Pennsylvania State University*	Using OpenSim in Comparative Biomechanics: A Simple Approach
9:15 am	**45-6**	*Badger MA, Combes SA; Univ of California, Davis*	MegaTracks: Deep learning methods enable rapid, automated tracking of complex motion sequences
9:30 am	**45-7**	*Gignac PM, Kley NJ; Oklahoma State University CHS, Stony Brook University*	780-sample Repeated-measures Study to Improve Visualization of Vertebrate Soft-tissue Anatomy Using DiceCT Imaging
9:45 am		**Coffee Break**	**Exhibit Hall**

8:00 AM – 9:45 AM **Session 46** **Room 24**

Evolution of Form and Function

Chairs: Christopher Martin, Katherine Corn

8:00 am	**46-1**	*Martin CH; University of North Carolina at Chapel Hill, University of California, Berkeley*	Performance, not competition, shapes the major features of adaptive landscapes: evidence from repeated field experiments and hybrid fitness in pupfishes
8:15 am	**46-2**	*Gamel KM, Flammang BE; New Jersey Institute of Tech, University of Akron*	Modeling evolutionary selection for performance, in the case of the remora adhesive disc
8:30 am	**46-3**	*Pos KM, Kolmann MA, Gao TR, Gidmark NJ; Univ of Massachusetts Lowell, George Washington University, University of Chicago, Knox College*	Evolutionary history versus dietary niche as factors shaping pharyngeal jaw structure in cyprinid fishes
8:45 am	**46-4**	*Keer SA, Cohen K, May C, McMenamin S, Hernandez LP; The George Washington University, Boston College*	Using a thyroid-disrupted zebrafish model to investigate the evolution of cypriniform novelties
9:00 am	**46-5**	*Corn KA, Martinez CM, Wainwright PC; Univ of California, Davis*	Feeding mode and prey type affect cranial mobility in coral reef fishes
9:15 am	**46-6**	*Bierbaum EL, Beachy CK, Diaz RE; Southeastern Louisiana University*	Unexpected Mesopodial and Digit Number Skeletal Variation in the Elongated and Limb Reduced Amphiuma Salamanders
9:30 am	**46-7**	*Sandes De Souza AP, Smith NM, Wilson RS; University of Brasilia, University of Sydney, University of Queensland*	Predicting success in physical activities: combining studies of sport and animal performance to enhance both disciplines

9:45 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:45 AM **Session 47** **Room 25**

Neurobiology and Sensory Biology

Chair: James Strother

8:00 am	**47-1**	*McMahan S, Bhandawat V; Duke University*	Contribution of biomechanics and neural activity in determining resting leg positions in *Drosophila*.
8:15 am	**47-2**	*Ruiz C, Theobald J; Florida International University*	Steering Responses to Motionless Stimuli in Flying Fruit Flies
8:30 am	**47-3**	*Chou A, Sayre ME, Cronin TW; Univ of Maryland Baltimore County, Univ of Arizona*	Structure through the stages: development of the central complex in predatory arthropods
8:45 am	**47-4**	*Strother JA, Haney WA; Oregon State University*	Identifying the neural encoding of respiratory cues in zebrafish
9:00 am	**47-5**	*Bazarini SN, Crook RJ; San Francisco State Univ*	Effects of Ethinyl Estradiol on Injury-Induced Plasticity in *Euprymna scolopes*
9:15 am	**47-6**	*Dabe EC, McCracken AR, Moroz LL; University of Florida, Wesleyan University*	Nervous System Evolution and Neuronal cell-type Innovations in Euthyneura Molluscs
9:30 am	**47-7**	*Dong G, Mitchell D, Moss A; Auburn University*	The structure and electrical activity of the tentacular apparatus of adult *Mnemiopsis leidyi*

9:45 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:45 AM **Session 48** **Room 12**

Communication and Cognition

Chair: Tim Wright

8:00 am	**48-1**	*Nowicki S, Dubois AL, Peters S, Rivera-Cáceres KD, Searcy WA; Duke University, University of Miami*	Song is not a reliable signal of general cognitive ability in a songbird
8:15 am	**48-2**	*Kohn GM, Apodaca J, Muñoz M, Strebe S, White SA, Wright TW; New Mexico State University, UCLA, New Mexico State University, New Mexico State University*	FoxP2 expression and vocal learning abilities in the budgerigar (Melopsittacus undulatus)
8:30 am	**48-3**	*Wright TF, Derryberry EP; New Mexico State University, University of Tennessee Knoxville*	One Trait or Many: Reexamining the Multidimensional Nature of Vocal Learning

8:45 am	**48-4**	*Mhatre N, Malkin R, Deb R, Balakrishnan R, Robert D; University of Toronto, University of Bristol, Indian Institute of Science*	Tree Crickets can make Optimal Tools
9:00 am	**48-5**	*Brittain CN, Still SE, Menon A, Cristol DA, Wada H; Auburn University, College of William and Mary*	Dietary Methylmercury Exposure Impedes Spatial Learning in Zebra Finches
9:15 am	**48-6**	*Solie SE, Caves EM, Nowicki S, Johnsen S; Duke University*	Investigating categorical perception of color in Trinidadian guppies
9:30 am	**48-7**	*Summers AP, Blob RW, Butler MA, Farmer CG, Fassbinder-Orth CA, Hernandez LP, Moore IT, Muller UK, Satterlie RA, Williams SH; Friday Harbor Labs, Clemson University, University of Hawaii, Trinity College, Dublin, Creighton University, George Washington University, Virginia Tech, CSU Fresno, UNC-Wilmington, Ohio University*	Integrative Organismal Biology - a journal of the Society for integrative and Comparative Biology

9:45 am ..... **Coffee Break** ..... **Exhibit Hall**

10:30 AM – 12:00 PM Session 49 — Room 1 & 2

Savin' the Seeds of Life - Conservation Biology

Chairs: Ricky Spencer, Jake Lasala

10:30 am	**49-1**	*Jackson KM, Moore PA; Bowling Green State University*	The Effects of Artificial Light at Night: Behavioral and Physiological Shifts within Two Crayfish Species, *Faxonius rusticus* and *Faxonius virilis*
10:45 am	**49-2**	*Vindiola BG, Davis TJ; Florida Atlantic University*	Assessing and Comparing Nest to Surf Mortality of Florida's East and West Coast Loggerhead Sea Turtle Hatchlings
11:00 am	**49-3**	*Spencer RJ; Western Sydney University*	Global Extinction of Freshwater Turtles.
11:15 am	**49-4**	*Marshall CD, Cullen JA, Al-Ansi M; Texas A & M University, Qatar University*	Spatiotemporal Movement Patterns of Hawksbill Sea Turtles (*Eretmochelys imbricata*) in an Extreme Environment: The Arabian Gulf as a Living Laboratory for Investigating Organismal Response to Climate Change
11:30 am	**49-5**	*Resh CA, Mahon AR; Central Michigan University*	Improving the Efficiency of DNA Extraction from Samples Collected for Environmental DNA Surveillance
11:45 am	**49-6**	*Lolavar A, Wyneken J; Florida Atlantic University*	Impacts of temperature and moisture on loggerhead sea turtle hatchlings in Florida

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

10:15 AM – 11:45 AM Session 50 — Room 3 & 4

Phylogenetics and Paleobiology

Chairs: Jessica Goodheart, Michelle Stocker

10:15 am	**50-1**	*Collins EE, Halanych KM, Mahon AR; Central Michigan Univ, Auburn Univ*	Phylogeny of sea spider (Arthropoda, Pycnogonida) families determined with mitochondrial genomes
10:30 am	**50-2**	*Goodheart JA, Collins AG, Cummings MP, Rawlinson KA; Univ of California, Santa Barbara, Univ of Maryland, Smithsonian Institution, Univ of Cambridge*	Using RNA-Seq to elucidate the phylogeny of Polycladida (Platyhelminthes), a flatworm clade with diverse life histories
10:45 am	**50-3**	*Moore JM, Osborn KJ; Florida Museum of Natural History, National Museum of Natural History*	A Targeted Exon-Capture Phylogenomic Approach to Resolve the Phylogeny of Chaetopteridae (Annelida)
11:00 am	**50-4**	*Lynch LM, Holleman G, Booth W; Washington University School of Medicine, University of Tulsa*	Accurate phylogenetic relationships can be produced from fragments of DNA
11:15 am	**50-5**	*Oswald JA, Allen JM, Lefebvre MJ, Steadman D, Guralnick R; University of Florida, University of Nevada*	Using ancient DNA to elucidate extinct taxon relationships and to understand the historical biogeography of the Caribbean
11:30 am	**50-6**	*Stocker MR, Nesbitt SJ, Kligman BT, Paluh DJ, Blackburn DC, Marsh AD, Parker WG; Virginia Tech, Florida Museum of Natural History, University of Florida, Petrified Forest National Park*	The Earliest Equatorial Record of Anurans: New Fossils from the Late Triassic of Arizona

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

10:15 AM – 12:00 PM **Session 51** **Room 5 & 6**

Bigger and Better? Endocrine Aspects of Growth and Development

Chairs: Kady Lyons, Tracy Langkilde

10:15 am	**51-1**	*Laslo M, Hanken J; Harvard University*	Thyroid hormone signaling-related gene expression in the hind limbs of the direct-developing frog *Eleutherodactylus coqui*
10:30 am	**51-2**	*Uehling JJ, Taff CC, Winkler DW, Vitousek MN; Cornell Univ*	Early life conditions influence adult response to stressors in a free-living passerine
10:45 am	**51-3**	*Kelleher JM, Mykles DL; Colorado State University*	Characterization of the molt cycle of the cherry shrimp, *Neocaridina davidi*
11:00 am	**51-4**	*Beatty AE, Schwartz TS; Auburn University*	Quantifying gene expression of top regulators of the Insulin and Insulin-like Signaling Network in the brown anole across tissues and developmental stages.
11:15 am	**51-5**	*Bebus SE, Jones BC, Anderson RC; Univ of Memphis, Florida State Univ, Florida Atlantic Univ*	Development of the Corticosterone Stress Response Among Passerine Nestlings
11:30 am	**51-6**	*Langkilde T, Adams T, Avery J, Warne R; Penn State, Southern Illinois*	Effects of anthropogenic noise on wood frog tadpoles
11:45 am	**51-7**	*Lyons K, Wynne-Edwards KE; University of Calgary*	Embryonic Steroidogenesis in an Elasmobranch with Matrotrophic Histotrophy

12:00 pm **Lunch Break**

10:15 AM – 11:30 AM **Session 52** **Room 13**

Reproductive and Social Behavior

Chair: Luc Donoyer

10:15 am	**52-1**	*Delaney DM, Janzen FJ; Iowa State University*	Risk-sensitive Maternal Investment: Evaluating Parent-offspring Conflict Over Nest-site Choice
10:30 am	**52-2**	*Dunoyer LA, Dapore Z, Seifert A, Van Cleve J; Univ of Kentucky*	Effects of Limb Loss via Autotomy and Regeneration on Reproductive Success in Female Red Swamp Crayfish
10:45 am	**52-4**	*Liebl AL, Russell AF, Schrey AW; University of South Dakota, University of Exeter, Georgia Southern University*	DNA methylation patterns of dispersal in a cooperatively breeding species
11:00 am	**52-5**	*Chmura HE, Zhang V, Wilbur SM, Barnes BM, Buck CL, Williams CT; Univ of Alaska Fairbanks, Northern Arizona Univ*	Does the Early Squirrel Get the Girl?: Chronotype in the Arctic Ground Squirrel
11:15 am	**52-6**	*Maury C, Serota MA, Williams TD*; Univ Jean Monnet, Simon Fraser Univ*	Phenotypic plasticity in diurnal activity and chronotype during parental care in European starlings (*Sturnus vulgaris*)

11:30 am **Lunch Break**

10:00 AM – 12:00 PM **Session 53** **Room 14 & 15**

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

Chair: Sheila Patek

10:00 am	**53-1**	*Bressman NB, Love JW, King T, Horne C, Ashley-Ross MA; Wake Forest University, Maryland Department of Natural Resources*	Emersion and functional terrestrial locomotion by the invasive Northern Snakehead, *Channa argus*
10:15 am	**53-2**	*Spencer TS, Hu DL; Georgia Institute of Technology*	Sniffing Scaling Study for Superior Sensing
10:30 am	**53-3**	*Malul D, Shavit U, Holzman R; Technion - Israel Institute of Technology, Tel-Aviv University*	Dancing out-of-phase: mechanical properties of coral tentacles contribute to mass transfer under wave induced flow
10:45 am	**53-4**	*Tingle JL, Sherman BM, Higham TE; Univ of California, Riverside*	Body Size and Shape Influence Kinematics of Sidewinding Locomotion in the Rattlesnake *Crotalus cerastes*
11:00 am	**53-5**	*O'Donnell MK, Deban SM; University of South Florida*	The effect of substrate roughness and porosity on salamander cling performance

11:15 am	**53-6**	*Matloff LY, Chang E, Stowers AK, Feo T, Jeffries L, Thompson C, Lentink D; Stanford University, Smithsonian Institution*	Feathers of a bird stick together: underactuation and directional adhesion in avian wing morphing
11:30 am	**53-7**	*Othayoth R, Thoms G, Li C; Johns Hopkins University*	Animals and robots vibrate to explore locomotion energy landscapes to make locomotor transitions
11:45 am	**53-8**	*Kenny MC, Crandall CL, Sinclair BJ, Socha JJ; Virginia Tech, University of Western Ontario*	Effects of environmental temperature on viscosity of *Manduca sexta* hemolymph
12:00 pm	**Lunch Break**		

10:00 AM – 11:45 AM **Session 54** **Room 20**

Smellin' and Livin' Together - Chemical and Community Ecology

Chair: Abigail Cahill

10:00 am	**54-1**	*Maro AE, Sandnel AA, Mitani JC, Dudley R; University of California Berkeley, University of Michigan Ann Arbor*	Ethanol concentrations within primate-consumed fruit in a tropical rainforest
10:15 am	**54-2**	*Johnson DE, Jonesboggs JD, Smith JPS; Winthrop University*	Effects of Beach Nourishment on the Meiofauna: Not all Bad?
10:30 am	**54-3**	*Wells CD, Yerrace S, Rautu TS, Spencer D, Sebens KP; Univ of Washington*	Population distribution and predator-prey relationships of the giant frilled anemone Metridium farcimen in the San Juan Islands
10:45 am	**54-4**	*Cahill AE, Breen C, Cortes C, Stander R; Albion College*	A salt marsh in Michigan? Characterization of invertebrates in a rare habitat type using molecular and morphological methods
11:00 am	**54-5**	*Brannock PM, Learman DR, Mahon AR, Santos SR, Halanych KM; Rollins College, Central Michigan University, Auburn University*	Meiobenthic community composition and biodiversity along a 5500 km transect of Western Antarctica: a metabarcoding analysis
11:15 am	**54-7**	*O'Connor MP, Neeman N, Spotila JR; Drexel University*	Physiological influences on sea turtle remigration intervals
11:30 am	**54-8**	*Dawson KR, Richardson DC, Weathers KC; Winston Salem State University, Suny New Paltz, Cary Institute of Ecosystem Studies*	How ecosystem function differs across a gradient of lake sizes: Don't forget about the little ones
11:45 am	**Lunch Break**		

10:00 AM – 11:15 AM **Session 55** **Room 22**

Doin' it with the Dinoflagellates - Coral Reef Biology

Chair: Sarah Davies

10:00 am	**55-1**	*Ritson-Williams R, Cunning R, Nunez-Pons L, Sogin E, Nelson C, Forsman Z, Willis S, Gates R, Albright R; California Academy of Science, Shedd Aquarium, Stazione Zoologica "Anton Dohrn", Max Planck Institute for Marine Microbiology, University of Hawaii at Manoa, Hawaii Institute of Marine Biology*	Integrating Genomics to Better Understand Coral Resilience to Bleaching
10:15 am	**55-2**	*Davies SW, Castillo KD, Bove CB, Ries JB; Boston University, UNC Chapel Hill, Northeastern University*	Local Adaptation and Transcriptome Plasticity of a Resilient Caribbean Coral
10:30 am	**55-3**	*Wuitchik DM, Almanzar A, Benson B, Brennan S, Chavez D, Liesegang M, Reavis J, Schniedewind M, Trumble I, Davies SW; Boston University*	Genomic Basis of Convergent Phenotypic Responses to Thermal Extremes in a Temperate Coral
10:45 am	**55-4**	*Fuess LE, Palacio A, Butler CC, Brandt ME, Baker AC, Mydlarz LD; University of Texas Arlington, University of Miami, University of the Virgin Islands*	Multiple experiments reveal complex relationships between symbiosis, immunity, and the transforming growth factor-beta pathway in a Caribbean coral, *Orbicella faveolata*
11:00 am	**55-5**	*Dimos B, Mydlarz L, Pellegrino M; University of Texas at Arlington*	Characterization of a novel stress resistance pathway in corals: The Mitochondrial Unfolded Protein Response
11:15 am	**Lunch Break**		

10:00 AM – 12:00 PM **Session 56** **Room 23**

Immunity, Inflammation, and Toxicology

Chairs: Leigh Boardman, Alysha Cypher

10:00 am	**56-1**	*Greco G, Evert B, Judge T, Mayville F, Slee J; DeSales University*	Wine your way to good health: Anti-Inflammatory Effects of Resveratrol
10:15 am	**56-2**	*Cervantes R, Vannorden GD, Barnello E, Restauro J, Chambers E, Mayville F, Slee JB; DeSales University*	Soursop is Truly Sour: Pro-Inflammatory Effects of Annonacin
10:30 am	**56-3**	*Culler ME, Onthank KL; Walla Walla University*	Immune Function in *Octopus rubescens* in Response to Ocean Acidification and Warming
10:45 am	**56-4**	*Brusch GA, Webster T, Wilson-Sayres M, Blattman J, Baldwin A, Denardo DF; Arizona State University, Mesa Community College*	A Mechanistic Approach to Understanding the Relationship Between Dehydration and Enhanced Immune Function
11:00 am	**56-5**	*Zhang Y, Hill GE, Ge Z, Park N, Taylor H, Andreasen V, Kavazis AN, Bonneaud C, Hood WR; University of Memphis, Auburn University, University of Exeter*	Effects of Mycoplasma gallisepticum on mitochondrial function and oxidative stress in house finch
11:15 am	**56-6**	*Buchanan JL, Montooth KL; University of Nebraska-Lincoln*	Metabolic costs of mounting immune responses in *Drosophila*
11:30 am	**56-7**	*Boardman L, Bailey WD, Hahn DA; Univ of Florida, USDA-APHIS-PPQ Center for Plant Health Science and Technology*	Amino acid and nucleotide signatures of irradiated insects
11:45 am	**56-8**	*Cypher AD, Hershberger P, Scholz N, Incardona JP; NOAA Northwest Fisheries Science Center, USGS Western Fisheries Research Center*	Larval cardiotoxicity and juvenile performance are likely contributors to the delayed fishery collapse of Pacific herring after the Exxon Valdez oil spill

12:00 pm **Lunch Break**

10:00 AM – 11:45 AM **Session 57** **Room 24**

DEDB Best Student Paper

Chairs: Kim Hoke, Yui Suzuki

10:00 am	**57-1**	*Sur A, Renfro A, Meyer NP; Clark University*	Investigating cellular and molecular mechanisms of neurogenesis in the annelid *Capitella teleta*
10:15 am	**57-2**	*Sia T, Adhikari H, Davidson B; Swarthmore College*	Mitotic rounding influences fate specification
10:30 am	**57-3**	*Barreto Corona G, Debiasse M, Ryan J, Davidson B; Swarthmore College, Whitney Marine Station, UFL*	The acquisition of self-sterility in a hermaphroditic tunicate
10:45 am	**57-4**	*Steinworth BM, Jean GH, Ryan JF, Martindale MQ; Univ of Florida Whitney Laboratory for Marine Bioscience, University of Miami*	Are Hox genes involved in asexual reproduction in the upside-down jellyfish *Cassiopea*?
11:00 am	**57-5**	*Grayson P, Young JJ, Edwards SV, Tabin CJ; Harvard University, Harvard Medical School*	Convergent Regulatory Evolution and Forelimb Heterochrony in Flightless Birds
11:15 am	**57-7**	*Barshad G, Levi T, Rotblat B, Mishmar D; Ben Gurion University of the Negev*	Mitochondrial-nuclear transcriptional co-regulation: mechanism and phenotypes
11:30 am	**57-8**	*Morris ZS, Pierce SE, Abzhanov A; Harvard University, Imperial College London*	The role of craniofacial growth zones in shaping crocodylian snouts

11:45 am **Lunch Break**

10:15 AM – 12:00 PM **Session 58** **Room 25**

Vision

Chair: Alexandra Kingston

10:15 am	**58-1**	*Kingston ACN, Havens LT, Cronin TW, Speiser DI; University of South Carolina, University of North Carolina Chapel Hill, University of Maryland Baltimore County*	The visual system of the snapping shrimp, *Alpheus heterochaelis*: morphology, physiology, and visually-influenced behavior
10:30 am	**58-2**	*Schweikert LE, Caves EM, Fitak RR, Solie SE, Sutton TT, Johnsen S; Duke University, Nova Southeastern University*	Patterns and Predictors of Spectral Sensitivity Variation in Fishes

10:45 am	**58-3**	*Perez LK, Kwiatkowski MA, Gumm JM; Stephen F. Austin State University*	Opsin Diversity in Anurans
11:00 am	**58-4**	*Hall BE, Bigman JS, Bedore CN; Georgia Southern University, Simon Fraser University*	Scaling and ecological relationships in the visual ecology of sharks
11:15 am	**58-5**	*Brandley N, Salazar B, Duncan A; College of Wooster, Colorado College*	A sexual dimorphism in the spatial vision of band-winged grasshoppers
11:30 am	**58-6**	*Rogers LS, Vetter BJ, Mensinger AF; University of Minnesota Duluth, University of Washington*	The Effect of Light Stimuli on Dark-Adapted Visual Sensitivity in Invasive Silver (*Hypophthalmichthys molitrix*) and bighead (*H. nobilis*) Carp
11:45 am	**58-7**	*Notar JC, Johnsen S; Duke University*	Sea Urchin Vision in Featureless vs. Spatially Complex Environments

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

10:15 AM – 12:00 PM **Session 59** **Room 12**

Chemosensory

Chair: Gabby Wolff

10:15 am	**59-1**	*Ozarkar S, Tao L, Bhandawat V; Duke University*	Delineating the Relationship between Olfactory Receptor Neuron Activity and Behavior in *Drosophila*
10:30 am	**59-2**	*Tao L, Ozarkar S, Bhandawat V; Duke University*	Mechanisms underlying attraction to odor in walking *Drosophila*
10:45 am	**59-3**	*Wolff GH, Riffell JA; Univ of Washington*	Smell-O-Vision: Functional Imaging of Odor-Evoked Activity and Neuromodulation in the Mosquito Antennal Lobe
11:00 am	**59-4**	*Van Nest BN, Daly KC, Willis MA; Case Western Reserve University, West Virginia University*	Blocking an Olfactory Corollary Discharge Circuit Impairs Odor Plume Tracking in *Manduca sexta*
11:15 am	**59-5**	*Bhandawat V, Tao L, Ozarkar S; Duke University*	Transformation from Sensation to Action in the Drosophila Olfactory System
11:30 am	**59-6**	*Wood TC, Moore PA; Bowling Green State University*	Dietary Cues from Fish have Indirect Effects on Aquatic Plant Communities Mediated by Changes in Crayfish Behavior.
11:45 am	**59-7**	*Kalyanasundaram P, Hinson C*, Willis M; Case Western Reserve University, Ohio*	Role of Bilateral Odor Sampling in the Odor Source Localization Behavior of *Manduca sexta*

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

Saturday Program Afternoon Sessions

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

1:30 PM – 3:30 PM **Session 60** **Room 1 & 2**

Complementary to S1: Integrative Plant Biology

Chair: Daniel Stanton

1:30 pm	**60-1**	*Sendall KM, Montgomery RA, Stefanski A, Reich PB; Georgia Southern Univeristy, University of Minnesota*	Effects of experimental warming on invasive *Rhamnus cathartica* as compared to native temperate and boreal tree species
1:45 pm	**60-2**	*Sharpe SL, Ungerer MC, Nippert JB; Kansas State University*	Effects of Drought Stress Across Population and Life Stage in Wild Foxtail Millet *Setaria viridis*
2:00 pm	**60-3**	*Steven JC, Collar DC, Brodie Iii ED, Delph LF; Christopher Newport University, University of Virginia and Mountain Lake Biological Station, Indiana University*	The relationship between genetic and functional architecture in leaf, physiological, and flower traits in *Silene latifolia*
2:15 pm	**60-4**	*McCaskey EN, Lehner K, Murray-Cooper M, Ozkan-Aydin Y, Hawkes EW, Benfey PN, Goldman DI; Georgia Tech, Duke University, UCSB*	Circumnutation Facilitates Effective Root-Surface Exploration of Rice Roots

2:30 pm	**60-5**	*Stanton DS, Harper SJ, Brlansky RH; Univ of Florida IFAS-CREC, Washington State Univ*	Using RNAscope As A Diagnostic Tool To Identify Two Citrus Viroids in Plant Tissues
2:45 pm	**60-6**	*Ferris KG, Coop GM, Schmitt J; Tulane University, Univ of California, Davis*	Genetics of Parallel Leaf Shape Evolution in the Mimulus guttatus Species Complex
3:00 pm	**60-7**	*Stubbs RL, Folk RA, Soltis DE, Cellinese N; University of Zurich, University of Florida*	Phylogenomics Resolves Relationships within an alpine-Artic plant clade (*Micranthes*, Saxifragaceae) and Reveals Evolutionary Processes and Historical Biogeography
3:15 pm	**60-8**	*Fetcher N, Parker TC, McGraw JB, Moody ML, Stunz E, Curasi SR, Tang J; Wilkes University, University of Stirling, West Virginia University, University of Texas, El Paso, University of Notre Dame, Marine Biological Laboratory*	Local Adaptation and Adaptive Lag in an Arctic Sedge, *Eriophorum vaginatum*

3:30 pm ..... **Coffee Break** ..... **Exhibit Hall**

1:30 PM – 3:15 PM **Session 61** **Room 3 & 4**

Macroevolution

Chairs: Johanna Cannon, Jonathan Chang

1:30 pm	**61-1**	*Burress ED, Wainwright PC; Univeristy of California, Davis*	Adaptive radiation in labrid fishes: a central role for functional novelties during 65 My of relentless diversification
1:45 pm	**61-2**	*Frederich B, Aguilar-Medrano R, Gajdzik L; University of Liège, Liège, CINVESTAV, Mérida*	Generalist Feeding Guilds in Reef Fishes: Macroevolutionary Sink or Future Source of Diversity?
2:00 pm	**61-3**	*Cannon JT, Roberts NG, Egan J, Hong C, Picciani N, Eernisse DJ, Oakley TJ; UC Santa Barbara, California State University Fullerton*	A lens to the past: timing of lens eye origins
2:15 pm	**61-4**	*Chang J, Alfaro ME, Rabosky DL; Univ of Michigan, Ann Arbor, Univ of California, Los Angeles*	Extending and remixing the complete ray-finned fish tree of life via fishtreeoflife.org
2:30 pm	**61-5**	*Swiderski DL, Zelditch ML; Univ of Michigan, Ann Arbor*	Divergence Deferred: Dynamic Changes in Ecological Opportunity Produce a Late Burst Radiation in Ground Squirrels
2:45 pm	**61-6**	*Ledbetter NM, Bonett RM; University of Tulsa*	Terrestrial Constraint on Salamander Limbs Sheds Light on Tetrapod Evolution
3:00 pm	**61-7**	*Juhn MS, Van Valkenburgh B, Alfaro ME; Univ of California, Los Angeles*	Exploring Macroevolutionary Ratchets as a Potential Driver of Clades in Decline

3:15 pm ..... **Coffee Break** ..... **Exhibit Hall**

1:30 PM – 3:15 PM **Session 62** **Room 5 & 6**

Sickness and the Microbiome

Chairs: Patricia Lopes, Lucas Kirschman

1:30 pm	**62-1**	*Vompe AD, Eisenlord ME, Winningham M, Harvell CD; Cornell University*	Ecology and transmission mechanisms of *Labyrinthula zosterae* in beds of *Zostera marina* seagrass
1:45 pm	**62-2**	*Angelini DR, Moore JA, Simmons WR, Averill AL; Colby College, University of Massachusetts, Amherst*	Neonicotinoid exposure alters microbial composition and host gene expression in the gut of the bumblebee, *Bombus impatiens*
2:00 pm	**62-3**	*Love AC, Durant SE; Oklahoma State University, University of Arkansas*	Does prior infection shape reproductive investment and parental effects in birds?
2:15 pm	**62-4**	*Lopes PC; Chapman Univ*	Why do We Feel Sick When Infected?
2:30 pm	**62-5**	*Kirschman LJ, Milligan-Myhre KC; University of Alaska Anchorage*	The effects of the mircobiota and host genetic background in defense against pathogens
2:45 pm	**62-6**	*Langford ML, Cain S, Howard JA, Franks BR; Florida Southern College, Jacksonville University*	I'll have a side salad with that: Bonnethead sharks, *Sphyrna tiburo*, host cellulose-degrading bacteria within their digestive tracts
3:00 pm	**62-7**	*Colston TJ, Ul-Hasan S; Florida State University, University of California, Merced*	iVAMP: An Initiative for Studying the Venom-Associated Microbiome and Its Biological Significance

3:15 pm ..... **Coffee Break** ..... **Exhibit Hall**

1:30 PM – 3:30 PM **Session 63** **Room 13**

Neuroanatomy

Chair: Ellen Dow

1:30 pm	**63-1**	*Yopak KE, McMeans BC, Mull C, Feindel KW, Kovacs KM, Lydersen C, Fisk AT, Collin SP; Univ of North Carolina Wilmington, Univ of Toronto Mississauga, Simon Fraser University, Univ of Western Australia, Norwegian Polar Institute, Univ of Windsor*	A Small Brain and a Big Nose: Comparative Brain Morphology of the Greenland and Pacific Sleeper Sharks
1:45 pm	**63-2**	*Timmer CM, Bergman DA; Grand Valley State University*	From the dinner pot to smoking pot; how a better understanding of cannabidiol could alleviate anxiety and modulate hunger
2:00 pm	**63-3**	*Peele EE, Sulikowski J, Yopak KE; University of North Carolina Wilmington, University of New England*	Hot Brains: The Effect of Temperature on Brain Development in the Little Skate (*Leucoraja erinacea*)
2:15 pm	**63-4**	*O'Brien HD; OSU Center for Health Sciences*	Parallel Evolution of Selective Brain Cooling in Artiodactyls
2:30 pm	**63-5**	*Leach WB, Reitzel AM; University of North Carolina at Charlotte*	Transcriptome Dynamics After Light Removal in a Model Cnidarian
2:45 pm	**63-6**	*Boyer AC, MacDougall-Shackleton SA; University of Western Ontario*	Spring and Autumn Temperatures Differentially Affect Nocturnal Migratory Restlessness in a Migratory Songbird
3:00 pm	**63-7**	*Dow EG, Rodriguez-Lanetty M; Florida Intl. Univ*	Cnidarian chemosensory iGluRs under the clout of circadian rhythm in the sea anemone *Exaiptasia pallida*
3:15 pm	**63-8**	*Enriquez VL, Crook RJ, Zink A; San Francisco St. Univ*	Effects of*Vibrio fischeri* colonization on cognition, foraging behavior, and survival in the Hawaiian bobtail squid

3:30 pm **Coffee Break** **Exhibit Hall**

1:30 PM – 3:30 PM **Session 64** **Room 14 & 15**

Robot Overlords

Chair: Zane Wolf

1:30 pm	**64-1**	*Xuan Q, Othayoth R, Li C; Johns Hopkins University*	in silico experiments reveal the importance of randomness of motions in cockroach's winged self-righting
1:45 pm	**64-2**	*Muijres FT, Karásek M, De Wagter C, Remes BDW, De Croon GCHE; Wageningen University, Delft University of Technology*	A Bio-inspired Free-flying Robot Reveals that Flies Use Torque Coupling in Rapid Banked Turns
2:00 pm	**64-3**	*Juarez YS, Di Santo V, Wilhelmus MM; Univeristy of California, Riverside, Harvard University*	Robokrill: a metachronal robotic swimmer
2:15 pm	**64-4**	*Descour ME, Devries LD, Evangelista DE; United States Naval Academy*	Soft robotic designs inspired by leeches
2:30 pm	**64-5**	*Wolf Z, Vogt D, Lauder GV; Harvard University, Wyss Institute*	Studying fish locomotion using a multi-segmented soft robotic, pneumatically-actuated model
2:45 pm	**64-6**	*Bagheri H, Jayanetti V*, Burch HR, Brenner CE, Arnold JK, Marvi H; Arizona State University*	A Bio-Inspired Robot for Locomotion on Dry and Wet Granular Media
3:00 pm	**64-7**	*Wu K, Nowak J, Breuer KS; Brown University*	Scaling of the Performance of Passive-Pitching Robotic Flapping Wings in Hovering Flight
3:15 pm	**64-8**	*Dizon RN, Solis AJ, Barnes CJ, Isaacs MR, Harris SL, Lee DV; University of Nevada-Las Vegas*	A robotic platform to test control strategies for bipedal walking

3:30 pm **Coffee Break** **Exhibit Hall**

1:30 PM – 3:00 PM **Session 65** **Room 20**

Complementary to S3: Playing with Power: Mechanisms of Energy Flow in Organismal Movement

Chair: Aimy Wissa

1:30 pm	**65-1**	*Challita EJ, Sinha S, Krugner R, Bhamla S; Georgia Institute of Technology, United States Department of Agriculture*	Insect pee: How glassy-winged sharpshooters excrete ultrafast fluid droplets

1:45 pm	**65-2**	*Eng CM, Oliver JD, Marsh RL, Azizi E, Roberts TJ; Brown University, University of California, Irvine*	A new role for intramuscular springs in energy cycling during locomotion
2:00 pm	**65-3**	*Abbott EM, Diaz K, Sawicki G; Georgia Institute of Tech*	The theoretical contributions of morphology to the power output of muscle-tendon units
2:15 pm	**65-4**	*Bolmin O, Socha JJ, Alleyne M, Dunn AC, Wissa AA; University of Illinois at Urbana-Champaign, Virginia Tech*	The click beetle latch mechanism: An in-vivo study using synchrotron x-rays
2:30 pm	**65-5**	*Bolmin O, Wei L, Hazel A, Alleyne M, Dunn A, Wissa A*; University of Illinois Urbana-Champaign*	Latch and release: how hinge morphology and mechanics enable the explosive click of Coleoptera Elateridae
2:45 pm	**65-6**	*Kaji T, Farley G, Jorge J, Longo S, Harrison J, Patek S, Palmer AR*; Univ of Alberta, Duke Univ*	Who Knew? Ultrafast Limb Movements in an Amphipod that Snaps
3:00 pm		**Coffee Break**	**Exhibit Hall**

1:30 PM – 3:15 PM **Session 66** **Room 21**

Care for the Planet - Conservation Biology & Community Ecology

Chair: Christopher Howie

1:30 pm	**66-1**	*McEntire KD, Maerz JC, Howard JS; Trinity University, University of Georgia*	Plant Climbing by Salamanders as a Compensatory Behavior in Relation to Climate
1:45 pm	**66-2**	*Howey CAF; University of Scranton*	Restoration of Timber Rattlesnake Rookeries: Efficacy of Daylighting Management
2:00 pm	**66-3**	*Williams CT, Chmura HE, Glass TW; Univ of Alaska Fairbanks*	Biologging physiological and ecological responses to climate change
2:15 pm	**66-4**	*Bentley BP, Mitchell NJ, Whiting SD; University of Western Australia, Department of Biodiversity, Conservation and Attractions*	End of the line? Nesting phenology shifts unable to mitigate adverse impacts of climate change on winter nesting sea turtles
2:30 pm	**66-5**	*Forsburg ZR; Texas State Univ*	Artificial light at night alters corticosterone levels in *Rana berlandieri* larvae
2:45 pm	**66-6**	*Aichelman HE, Bove CB, Castillo KD, Boulton JM, Knowlton AC, Ries JB, Davies SW; Boston Univ, Univ of NC, Chapel Hill, Northeastern Univ*	Reef Zone-Specific Physiological Responses of Two Caribbean Corals Exposed to Multiple Global Change Stressors
3:00 pm	**66-7**	*Coleman A, Scott DE, Capps KA, Park AW, Lance SL*; Univ of Georgia*	Environmental Factors Outweigh Community Ecology in Ranavirus Transmission
3:15 pm		**Coffee Break**	**Exhibit Hall**

1:30 PM – 3:15 PM **Session 67** **Room 22**

Morphology and Mechanics Through Time

Chairs: Sara Elshafie, Ryan Carney

1:30 pm	**67-1**	*Lund R, Grogan ED, Jacob A; St Josephs University*	A 320 million year old rayfin fish ahead of its time - A radically different skeletal design in the Paleozoic
1:45 pm	**67-2**	*Nyakatura JA; Humboldt University*	Analyzing the Locomotion of a Stem Amniote: *Orobates pabsti*
2:00 pm	**67-3**	*Elshafie SJ; Univ of California, Berkeley*	Earliest Evidence of Tail Regeneration in a Derived Fossil Squamate
2:15 pm	**67-4**	*Hanson M, Burnham D, Bright J, Carney R, Bhullar BAS; Yale University, University of Kansas*	The First Three-Dimensional Reconstruction of the Skull and Musculature of a Cretaceous Toothed Bird, *Hesperornis regalis*
2:30 pm	**67-5**	*Carney RM; University of South Florida*	Evolution of the Archosaurian Shoulder Joint and the Flight Stroke of *Archaeopteryx*
2:45 pm	**67-6**	*Padian K; Univ of California, Berkeley*	Launch Mechanics of *Quetzalcoatlus* and Other Large Pterosaurs: A Test of Three Hypotheses
3:00 pm	**67-7**	*Sathe EA, Chronister NJ, Dudley R; Univ of California, Berkeley*	Incipient Wing-Flapping Enhances Aerial Performance in a Robotic Glider
3:15 pm		**Coffee Break**	**Exhibit Hall**

1:30 PM – 3:30 PM **Session 68** **Room 23**

Muscle Physiology, I

Chairs: Angela Horner, Henry Astley

1:30 pm	**68-1**	*Sleboda DA, Roberts TJ; Brown University*	The interaction of intracellular fluid and extracellular collagen influences active contractile force in skeletal muscle
1:45 pm	**68-2**	*Horner AM, Azizi E, Roberts TJ; Cal State University, San Bernardino, Univ of California, Irvine, Brown University*	Passive muscle stiffness is correlated to in vivo muscle operating lengths
2:00 pm	**68-3**	*Whitney C, Daley M, Nishikawa K*; Northern Arizona University, Royal Veterinary College*	Muscles as length-dependent force generators.
2:15 pm	**68-4**	*Sullivan CM, Carr JA, Tytell ED; Emmanuel College, Salem State Univ, Tufts Univ*	Muscle response to lengthening and shortening perturbations at various activation and perturbation phases.
2:30 pm	**68-5**	*Taylor-Burt KR, Biewener AA; Harvard University*	Is the lateral gastrocnemius tuned for a mallard duck's preferred cycle frequency?
2:45 pm	**68-6**	*Ryan DS, Stutzig N, Siebert T, Wakeling JM; Simon Fraser University, University of Stuttgart*	Passive and Dynamic Muscle Architecture during Transversal Loading for Gastrocnemius Medialis in Man
3:00 pm	**68-7**	*Astley HC, Siddiqui HK, Laredo D; University of Akron, Denison University, Carnegie Mellon University*	High Hysteretic Energy Loss in Mouse Tendons
3:15 pm	**68-8**	*Schulz AK, Wu JN, Hu DL; Georgia Institute of Technology*	Elephants wrap their trunks around objects to better distribute forces

3:30 pm **Coffee Break** **Exhibit Hall**

1:30 PM – 3:15 PM **Session 69** **Room 24**

Ecomorphology

Chairs: Kelly Diamond, Marguerite Butler

1:30 pm	**69-1**	*Tran LL, Butler MA; University of Hawaii at Manoa*	Color variation and the diversification of Megalagrion damselflies
1:45 pm	**69-2**	*Betz O, Heethoff M, Garamszegi LZ, Koerner L; University of Tübingen, Technical University of Darmstadt, Estación Biológica de Doñana-CSIC, University of Tübingen, Germany, Frau*	The beetles with the protrusible tongue: Integration of form, function, and ecology in the predatory rove beetles Stenus spp.
2:00 pm	**69-3**	*Nash CM, George AB, McCord CL, Westneat MW; University of Chicago, Chapman University*	Functional Biogeography: Patterns of SpatioTemporal Evolution of Biomechanical Traits in the Triggerfishes (Balistidae)
2:15 pm	**69-4**	*Diamond KM, Schoenfuss HL, Blob RW; Clemson Univ, St. Cloud State Univ*	Examining Patterns of Climbing and Escape Performance over Migration Pulses in the Hawaiian Goby *Sicyopterus stimpsoni*
2:30 pm	**69-5**	*Hill EH, Jarman MJ, Butler MA; University of Hawaii*	Living the 'High' Life: The Morphological, Kinematic, Ecological and Genetic Variation between Papuan Microhylid Frogs at Lower and Higher Elevations
2:45 pm	**69-6**	*Butler MA, Goo NLS, Fraser CJ, Sung HW, Rivera JA; University of Hawaii, Arizona State University*	Ecomorphology of Papuan Microhylid Frogs: Performance, Hindlimb Musculature, and MicroCT Analysis
3:00 pm	**69-7**	*Hedrick BP, Dumont ER, Pierce SE; Univ of Oxford, Univ of California, Merced, Harvard Univ*	The Evolutionary Success of Rodents Is Not Linked to the Evolution of Locomotor Innovation

3:15 pm **Coffee Break** **Exhibit Hall**

1:30 PM – 3:30 PM **Session 70** **Room 25**

Vertebrate Development and Evolution

Chairs: Craig Albertson, Thom Sanger

1:30 pm	**70-1**	*Navon D, Hatini P, Zogbaum L, Olearczyk N, Albertson RC; University of Massachusetts Amherst*	Genetic architecture of coordinated plastic responses across different traits in African cichlids

1:45 pm	**70-2**	*Sanger TJ, Czesny B, Harding L, Dhindsa S; Loyola University Chicago*	Normal and abnormal craniofacial morphogenesis in the lizard *Anolis sagrei*
2:00 pm	**70-3**	*McNamara GPJ, Kircher, Cohn ; University of Florida*	Sexually dimorphic digit development in Anolis sagrei
2:15 pm	**70-4**	*Lencer ES; University of Colorado Anschutz Medical Campus*	Modifications to cell proliferation underlie differences in craniofacial phenotype between closely related species (genus: *Cyprinodon*)
2:30 pm	**70-5**	*Stewart TA, Lemberg JB, Shubin NH; University of Chicago*	The dorsoventral patterning and asymmetry of paired fins
2:45 pm	**70-6**	*Criswell KE, Gillis JA; University of Cambridge*	Evolution of Axial Segmentation Across Vertebrates
3:00 pm	**70-7**	*Diaz RE, Roellig D, Bronner M, Trainor PA; Southeastern Louisiana University, California Institute of Technology, Stowers Institute for Medical Research*	From Climbing Trees to Phylogenetic Trees: Veiled Chameleons (*Chamaeleo calyptratus*) as a Squamate Model to Fill Our Evolutionary Gaps in Vertebrate Neural Crest Cell Induction, Migration and Differentiation.
3:15 pm	**70-8**	*Zogbaum L, Navon D, Albertson RC*; Bryn Mawr College, Univ Massachusetts, Amherst*	Foraging Environment Influences Shape and Genetic Architecture of Cichlid Gill Raker Anatomy and Reveals New Roles for Hedgehog Signaling

3:30 pm ..... **Coffee Break** ..... **Exhibit Hall**

1:30 PM – 3:30 PM | Session 71 | Room 12

Sensory Biology
Chair: Dan Speiser

1:30 pm	**71-2**	*Capshaw G, Soares D, Carr CE; Univ of Maryland, College Park, New Jersey Institute of Technology*	Extratympanic auditory sensitivity to sound and vibration in lungless salamanders
1:45 pm	**71-3**	*Henderson KW, Hale ME; Univ of Chicago*	Whole fin neural mapping uncovers complexity of sensory architecture and function
2:00 pm	**71-4**	*Speiser DI, Chappell DR, Kingston ACN; Univ of South Carolina*	The Eyespots of *Chiton* (Mollusca: Polyplacophora) are Associated with Spatial Vision
2:15 pm	**71-5**	*Palermo NA, Theobald JC; Florida International Universtiy*	Fruit flies shift their visual attention to compensate for fast optic flow during flight.
2:30 pm	**71-6**	*Kaushik PK, Renz M, Olsson SB; National Centre for Biological Sciences, Hochschule, Bremen*	MultiMoVR : MULTI MOdal Virtual Reality arena for flying insects
2:45 pm	**71-7**	*Kessler BJ, Yan L, Sanko K, Elias DO; Univ of California, Berkeley*	How do jumping spiders use visual and vibratory information to catch prey?
3:00 pm	**71-8**	*Maruska KP, Nikonov AN; Louisiana State University*	Male Dominance Status Regulates Odorant-Evoked Processing in a Forebrain Decision Center of a Cichlid Fish
3:15 pm	**71-9**	*Niederhauser JM, Ziadi MP, Blakely B, Anderson RC; Florida Atlantic University*	Spatial pattern of song sharing in Bachman's sparrows

3:30 pm ..... **Coffee Break** ..... **Exhibit Hall**

7:00 PM – 8:00 PM | AMS Lecture | Room 12 & 13

AMS Lecture — *Conn DB; Berry College, Harvard University* — Functional Morphology Meets Infectious Disease Epidemiology: How Parasitic Flatworms Move Between and Within Hosts

7:00 PM – 8:00 PM | BERN Lecture | Room 14-17

BERN Lecture — *Romero ML; Tufts University* — Scared, Cold, and Hungry – Stress from the Arctic to the Equator

SATURDAY POSTER SESSION P2

Central Exhibit Hall, 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

Special Focus Meeting on Organismal Botany

P2-1	*Chomentowska A, Miller JS; Yale University, Amherst College*	Variation in interspecific reproductive barriers between *Solanum* species
P2-2	*Stubbs RL, Theodoridis S, Keller B, Conti E; University of Zurich, University of Copenhagen*	The evolutionary roles of hybridization and introgression: investigating species and genomic boundaries using the model plant system *Primula* (Primulaceae)
P2-3	*Howard CC, Cellinese N; University of Florida, University of Florida*	Breaking Ground on Bulb Evolution in the Monocots
P2-4	*Dobkowski KA, Flanagan KD, Crofts SB, Dethier MN; Bates College, Friday Harbor Labs, University of Illinois, University of Washington*	Ecology and scaling of juvenile bull kelp (*Nereocystis luetkeana*)
P2-5	*Jaramillo AM, Koval MK, Rodriguez KM, Sanchez AM, Dunn SR, Der JP, Burnaford JL; California State University Fullerton*	Stayin' Alive? Assessing the ability of an intertidal seaweed to recover from repeated exposure to desiccation and high temperatures during low tide
P2-6	*Hall MR, Berg O, Müller UK; California State University Fresno*	Bladderwort as a model organism to study predator-prey interactions in an ambush predator
P2-7	*Park MH, Gersony JT, Rockwell FE, Holbrook NM; Harvard University*	Leaf-Level Carbon Dynamics of Trees with Various Phloem Loading Strategies in Elevated CO_2 Conditions
P2-8	*Welp EW, Kotara K, Shinkle J; Trinity University*	Contrasting Results for Responses of Plants to Short Wavelength UV-B Radiation in Laboratory and Natural Light Environments
P2-9	*Worley CA, Nebhut AN, Shinkle JR; Trinity University*	Long Term Effects of High Energy UV-B on Texas Native Grass Pigmentation and Structure
P2-10	*Nebhut AN, Worley CA, Shinkle JR; Trinity University*	Individual Variation in Untreated *Schizachyrium scoparium* Metrics Used to Quantify Responses to UV-B Radiation
P2-11	*Feipel C, Tatum Parker T; Saint Xavier University*	Bisphenol A's impact on the germination and growth rate of *Brassica rapa*
P2-12	*Coyle J, Porter ME, Rodriguez C; Florida Atlantic University, Pine Jog Environmental Education Center*	Partnering with PreK-12 STEM education to propagate, track establishment and survivorship of native plants in Florida

Evolution and Development of Body Plans

P2-13	*Root ZD, Jandzik D, Medeiros DM; University of Colorado Boulder*	Straw, Sticks, and Bricks: Understanding Vertebrate Musculoskeletal Evolution through Fibrillar Collagens and their Diversification
P2-14	*Webster NB, Meyer NP; Clark University*	How conserved are centralized nervous systems across Bilateria? Investigating the role of BMP receptors in specifying neural fate and the dorsal-ventral axis in the marine annelid *Capitella teleta*
P2-15	*Adhikari H, Sia T, Davidson B; Swarthmore College*	Actin dynamics facilitate localized trafficking of growth factor receptors
P2-16	*Laslo M, Just J*, Angelini DR; Harvard University, Colby College*	Beyond *D. melanogaster*: Insect Sex Determination in the Large Milkweed Bug
P2-17	*Nakanishi N; University of Arkansas*	Investigating the developmental regulatory role of the class IV POU/brn-3 gene in a sea anemone
P2-18	*Tews VH, Barnett AA; DeSales University*	Interrogating the Evolution of Epidermal Growth Factor (EGF) Pathway Ligands in Insects
P2-19	*Lanza AR, Seaver EC; University of Florida*	Insights into the role of TGF-β superfamily signaling in annelid dorsal-ventral axis formation

P2-20	*Nolte P, Smith FW; Hope College, University of North Florida*	Expression Patterns of Gut Genes During Development in Tardigrades
P2-21	*Jean GHQ, Steinworth B, Martindale MQ; University of Miami, University of Florida*	Oral-Aboral Axis Specification in 'Upside Down Jellyfish' *Cassiopea xamachana*
P2-22	*Debiasse M, Colgan W, Rodrigues D*, Ryan J, Davidson B; Whitney Labs, UFL, Swarthmore College*	Developmental systems drift in tunicate heart gene regulatory networks
P2-23	*Cumming M, Smith FW; University of North Florida*	A Novel Developmental Mechanism Patterns Legs in Tardigrades
P2-24	*Shin SH, Sarwar PF, Cheng C, Suzuki Y; Wellesley College*	The role of Ventral veins lacking in endocrine gland development and molting
P2-25	*Socki FM, Panhuis TM; Ohio Wesleyan University*	Comparative Histological Investigation of the Ovarian and Placenta Structure in The Viviparous Fish Genus Poeciliopsis

Complementary to Symposium S6: Beyond the Powerhouse: Integrating Mitonuclear evolution, physiology, and the theory in comparative Biology

P2-26	*Kvistad L, Amos N, Austin L, Falk S, Gan HM, Low G, Morales H, Pavlova A, Stier A, Walters J, Sunnucks P; Monash University, Deakin University, University of Gothenburg, University of Glasgow*	Neo-Sex Chromosomes May Drive Mitonuclear Selection in the Eastern Yellow Robin
P2-27	*Jayasundara N, Kozal J, Massarsky A, Trevisan R, Blue M, Bone AJ, Lindberg CD, Di Giulio RT; Univ of Maine, Duke University, NC, Univ of North Carolina Chapel Hill*	Later-life persistent bioenergetic effects of exposure to multiple mitochondrial stressors during development in zebrafish *Danio rerio*
P2-28	*Parry HA, Josefson C, Taylor HA, Andreasen V, Park NR, Hood WR, Kavazis AN; Auburn University*	Immune Challenge During Reproduction has Minimal Impact on Mitochondrial Respiration and Oxidative Stress
P2-29	*Schwartz TS, Klabacka RL*, Gangloff EJ, Bronikowski AM; Auburn University, Station d'Ecologie Théorique et Expérimentale du CNRS, Iowa State University*	Population genetics of the electron transport chain in snake populations exhibiting divergent resting metabolic rates.
P2-30	*Dhawanjewar AS, Meiklejohn CD, Montooth KL; University of Nebraska-Lincoln*	Mitochondrial Diseases and Compensated Pathogenic Deviations
P2-31	*Sokolov E, Markert S, Hinzke T, Sokolova IM*; Leibniz Institute for Baltic Sea Research, University of Greifswald, University of Rostock*	Proteomic rearrangements underlie mitochondrial responses to intermittent hypoxia in a hypoxia-tolerant marine bivalve *Crassostrea gigas*

Sensory Biology

P2-32	*Diorio RA, Howey CAF; University of Scranton*	Does Substrate Type Affect Scent-trailing Behavior of Adult and Newborn Timber Rattlesnakes?
P2-33	*Short LJ, Johnson DH, Wright MA, Deemer GA, Mackay SB, Bergman DA; Grand Valley State University*	Olfactory Alarm Signaling in Crayfish
P2-34	*Abdulelah SA, Crile KG, Awali S, Khalil HH, Belanger RM; University of Detroit Mercy*	An investigation of olfactory sensory neuron morphology in the crayfish (*Faxonius virilis*) following atrazine exposure
P2-35	*Fabian JM, Maeda M, Siwanowicz I, Walker S, Bomphrey R, Lin HT; Imperial College London, Royal Veterinary College, HHMI Janelia Research Campus, University of Leeds*	Toward the Neural Representation of Aeroelasticity in Insect Wings
P2-36	*Kim J, Fuse M; San Francisco State University*	DNA methylation regulates different nociceptive responses to strong vs. mild stimuli in *Manduca sexta*
P2-37	*Kelley MD, Caglianone J*, Mendonca MT; Auburn University*	Gopher tortoises behaviorally utilize UV signals in their external environment
P2-38	*Kelley MD, Ka C, Mendonca MT; Auburn Univerisity*	*Gopherus polyphemus* behaviorally discriminate conspecific chemical cues from other environmental chemical cues
P2-39	*Roy T, Suriyampola PS, Flores J, Lopez M, Martins EP; Arizona State University*	Habitat Features and Artificial Selection Determine Color Preferences in Zebrafish *Danio rerio*
P2-40	*Anselmo CM, Butler JM, Maruska KP; Louisiana State University*	The Lateral Line System Mediates Reproductive Interactions in the African Cichlid Fish, *Astatotilapia burtoni*
P2-41	*Jones AE, Webb JF; Univ of Rhode Island*	The Lateral Line System of Larval Brook Trout, *Salvelinus fontinalis*: Early Indications of Life in Flowing Water

P2-42	*Nickles KR, Webb JF; University of Rhode Island*	Does Habitat Predict Lateral Line Morphology Among Species of Neon Gobies (Genus *Elacatinus*)?
P2-43	*Molnar EJ, Webb JF; University of Rhode Island*	Elaborations of the Lateral Line System in Tetras (Family Characidae: Order Characiformes)
P2-44	*Levendosky MW, Bedore CN; Georgia Southern Univeristy*	Bioelectric potentials of shark prey are independent of body size
P2-45	*Leslie CE, Rosencrans RF, Bazan NG, Farris HE; Univ of Texas, Austin, Louisiana State University School of Medicine*	Hormonal Modulation of Retinal Sensitivity in a Neotropical Frog
P2-46	*Havens LT, Kingston ACN, Speiser DI; UNC Chapel Hill, USC Columbia*	A novel, automated approach to electroretinography
P2-47	*Gingras MA, Easter JH, Ramirez MD, Goodheart JA, Newcomb JM; New England College, University of Massachusetts, University of California*	R-opsin Localization in Dermal Extraocular Photoreceptors of *Hermissenda opalescens* and *Berghia stephanieae*
P2-48	*Le DA, Cook TA, Buschbeck EK; University of Cincinnati, Wayne State University School of Medicine, Detroit*	Extended electroretinogram (ERG) analysis to probe for genetically induced photoreceptor deficiencies in *Drosophila melanogaster*
P2-49	*Hassert JC, Stahl A, Buschbeck EK; University of Cincinnati, Scripps Florida Society of Research Fellows*	Gaining Focus: Using RNAi to Understand How T. marmoratus Larval Eyes Maintain Focus
P2-50	*Fasick JI, Serba KM; The University of Tampa*	Whale Shark (*Rhincodon typus*) Retinal Pigments and Visual Foraging Ecology
P2-51	*Colavita M, Witherell H, Erickson J, Schreiber W; University of Louisville, Washington and Lee University*	Measurement of Discrete Behaviors in Ants Using Spatially-Averaged Intensity Gradients

Neuroanatomy & Physiology

P2-52	*Smith TD, McBurney DM, Rehorek SJ; Slippery Rock University, NEOMED*	Presence of lipocalin in the vomeronasal gland of primates: a preliminary study.
P2-53	*Ramirez S, Melton RL, Fuse M; San Francisco State University*	Protein synthesis is required for long-term nociceptive sensitization in the hornworm, Manduca sexta
P2-54	*McDonald MS, Cohen JH, Porter ML; University of Hawai'i at Mānoa, University of Delaware*	Visual physiology of the grass shrimp *Palaemonetes vulgaris*
P2-55	*Fjordbotten KM, Brinkman BE, Iwaniuk AN; Univ of Lethbridge, Alberta*	Sexual Dimorphism in the Morphology of Neurons in the Prefrontal Cortex of Richardson's Ground Squirrels
P2-56	*Brinkman BE, Ngwenya A, Fjordbotten KM, Stephen O, Kolb B, Iwaniuk AN; Univ of Lethbrige, Rhodes Univ*	Hippocampal Neuronal Morphology and Spine Density Vary With Sex and Season in Richardson's Ground Squirrel (*Urocitellus Richardsonii*)
P2-57	*Kunselman LF, Sanchez N, Kingston AC, Speiser DI; Univ of South Carolina*	Characterizing the Optic Lobes of the Florida Fighting Conch *Strombus alatus*
P2-58	*Stilson KT, Ross C, Reed D; The University of Chicago, The University of Illinois*	Periodontal ligament innervation in *Didelphis virginiana* informs the study of neuronal function and evolution at the Eutherian-Metatherian split
P2-59	*Racicot KJ, Cunha FB, Henriksen R, Wright D, Iwaniuk AN; Univ of Lethbridge, Linköping University*	Chickens Have Larger Cerebella Than Junglefowl: Implications for the Effects of Domestication on the Brain
P2-60	*McPherson DR; SUNY Geneseo, New York*	Retrograde labeling of neuronal projections to the heart in the pond snail, Lymnaea stagnalis
P2-61	*Feipel CW, Krohmer RW; Saint Xavier University*	Mapping Aromatase Immunoreactive Neurons and Estrogen Receptors During Early Life Stages of Brain Development in Male Red-Sided Garter Snakes.
P2-62	*Auletta A, Mesce KA; Univ of Minnesota*	An Examination of Biogenic Amines in the Nervous System of the Scorpion *Centruroides sculpturatus* (Scorpiones: Buthidae): Insights Into the Evolution of Neural Signaling in the Arthropoda
P2-63	*Ramirez MD, Dwyer J, Bergan JF, Katz PS; Univ of Massachusetts Amherst*	Creation of a standardized reference brain atlas for the nudibranch, *Berghia stephanieae*
P2-64	*Krohmer RW, Alcala DM*; Saint Xavier University*	Colocalization of Aromatase and Nitric Oxide Immunoreactive Neurons in the Forebrain of the Male Red-Sided Garter Snake

P2-65 *Andres A, Seibel BA, Slesinger E, Saba G, Saba V, Morris J; University of South Florida, Rutgers University, NOAA, Mote Marine Laboratory* — How Low Can Predators Go? Hypoxia Tolerance of Coastal Shark Species of Varying Lifestyle

P2-66 *Cunha FB, Wylie D, Gutierrez-Ibanez C, Iwaniuk AN; Univ of Lethbridge, Univ of Alberta* — How Do Neuronal Scaling Rules Apply to the Evolution of the Avian Cerebellum?

P2-67 *Ronald KL, Hurley LM; Indiana University, Indiana University* — Neural Activation of the Inferior Colliculus to Multimodal Stimuli in the House Mouse (*Mus musculus*)

P2-68 *Chaby LE, Liberzon I, Lisieski MJ, Karavidha K, Perrine SA; Wayne State University, Texas A&M, Wayne State University* — Cognitive Flexibility Attenuates the Effects of Severe Stress on Fear Memory and Monoamine Levels in Rat Brains

P2-69 *McCracken AR, Dabe EC, Moroz LL; Wesleyan University, University of Florida* — Neuronal Cell-type Homologies and Nervous System Innovations in Euthyneuran Molluscs

Neuroethology

P2-70 *Sharp SL, Breda JR, Todd KL; Westminster College* — Identical reproductive behaviors rely on different motor circuits

P2-71 *Ayali A, Talal S, Gefen E; Tel Aviv University, University of Haifa-Oranim* — Interactions Between Carbon Dioxide and Oxygen Sensing in the Control of Locust Ventilatory Pattern Generation

P2-72 *Mohan U, Manjunath M, Sane SP*; National Centre for Biological Sciences, TIFR* — Multimodal integration by descending neurons in hawkmoths

P2-73 *Chappell DC, Speiser DI; Univ of South Carolina, Columbia* — Neuroethology of the distributed visual system of the eyed chiton *Acanthopleura granulata*.

P2-74 *Quinlan PD, Ramirez MD, Drescher B, Katz PS; Univ of Massachusetts Amherst* — Behavioral Characterization of *Berghia stephanieae*: A Novel Laboratory Species for Neuroethological Research

P2-75 *Arnone AA, Satterlie RA; University of North Carolina Wilmington* — Innervation of wing musculature by modulatory neurons in the pteropod mollusk *Clione limacina*

P2-76 *Platfoot KE, Satterlie RA; University of North Carolina, Wilmington* — Neuromodulatory Innervation of the Buccal Cone Muscles of the Pteropod Mollusk, *Clione limacina*

P2-77 *Satterlie R; University of North Carolina Wilmington* — Buccal Cone Structure and Prey Acquisition in the Pteropod Mollusk Clione limacina

P2-78 *Zamore SA, Socha JJ; Virginia Tech, Virginia Tech* — Development of a virtual reality arena to study vision in flying snakes

P2-79 *South KE, Leininger EC; New College of Florida* — The role of laryngeal physiology in generating advertisement calls of *Xenopus muelleri*

P2-80 *Xiang A, Gaglio A, Pellicano A, Gardyn N, Shalov J, Lynch KS; Hofstra University* — Comparison of candidate genes in hypothalamic brain regions in blackbirds with stark divergence in maternal care strategies

P2-81 *Maltby R, Nourbakhsh-Rey M*, Markham MR; University of Oklahoma* — Metabolism Sensing Mechanisms in the Electric Organ Cells of a Weakly Electric Fish

P2-82 *Guo Y, Clark EC*, Renn SCP; Reed College, Portland State University* — Hunger in the Operant Conditioned Cichlid *A. burtoni*. Quantified in Velocity by an Arduino based Robotic System

Biological Rhythms

P2-83 *Markland S, Ortiz Alvarado CA, Twombly Ellis JF, Cordero Martinez CS, Silva Echeandia SA, Petanidou TF, Tscheulin T, Barthell JF, Giray T, Agosto Rivera JL, Abramson CI; Oklahoma State University, University of Puerto Rico, Cornell University, University of the Aegean, University of Central Oklahoma* — Honey Bee Shift Work in Comparison to Learning Behavior and Foraging Profiles

P2-84 *Fassbinder-Orth C, Hughes S; Creighton University* — Radio-Frequency Identification as a Tracking System: a study of honey bee behavior

P2-85 *Vachon JC, Newcomb JM; New England College* — The Nudibranch *Berghia stephanieae* Exhibits Circadian Rhythms of Crawling

P2-86 *Wood MN, Soltis J; Disney's Animal Kingdom* — Measuring and Mediating Night Light at the Zoo

P2-87 *Hahn TP, Cussen VA, Dingle H, Robart AR, Watts HE, Cornelius JM; Univ of California, Davis, Washington State Univ, Eastern Michigan Univ* — The omnivore's opportunity: Importance of alternate foods for movement, molt and reproduction in diet specialist, nomadic songbirds

P2-88 *Shor EK, Freeman DA; Univ of Memphis* — Brain Sites Mediating Melatonin Regulation of Immune Function and Stress in Siberian Hamsters (*Phodopus sungorus*)

P2-89 *Duncan CM, Christian HC, Chmura HE, Buck CL, Brian BM, Loudon ASI, Williams CT; Univ of Alaska Fairbanks, Univ of Oxford, Northern Arizona Univ, Univ of Manchester*
Ultrastructural Changes Within the Pituitary Associated with Reproductive Timing in a Hibernating Mammal

P2-90 *Kernbach ME, Cassone V, Martin LB; University of South Florida, University of Kentucky*
The Impact of Light Pollution on Melatonin Secretion in House Sparrows

P2-91 *Lefauve MK, Hernandez LP; George Washington University*
Invasive Correlated Behavioral Traits in Cypriniform Fish

P2-92 *Ambrose A, Chambers C, Cordero Martinez C, Markland S, Osborn A, Shirley K, Twombly Ellis J, Silva Echeandia S, Giray T, Gonzalez V, Hranitz J, Barthell J*; Savannah State University, University of Kansas, University of Puerto Rico, Oklahoma State University, The College of New Jersey, Colorado College, Cornell University, Bloomsburg University, University of Central Oklahoma*
Foraging Patterns of Three Carpenter Bee Species at Chasteberry (*Vitex agnus-castus*) Bushes on the Greek Island of Lesvos

P2-93 *Hernandez E, Vásquez OA, Torucco A, Rahman MDS; University of Texas Rio Grande Valley*
Annual and Lunar Reproductive Rhythms of the Atlantic Sea Urchin in the Southern Gulf of Mexico

Predator/Prey Interactions

P2-94 *Meyer SC, Johnson CA, Pintor LM; Georgia Southern Univ, Ohio State Univ*
Giving Up Density as an Approach to Identify a Difference in Foraging Behavior Between Native and Invasive Crayfish Species

P2-95 *Simonitis LE, Marshall CD; Texas A&M University at Galveston*
Preliminary Data on the Effects of Ink on Shark Swimming Behavior

P2-96 *Quimby K, Crews SC, Spagna JC; William Paterson University, California Academy of Sciences*
Compensation for leg-loss in rotating prey-strikes of 'flattie' spiders (Araneae: Selenopidae)

P2-97 *Lepiane KL, Clark CJ; University of California, Riverside*
Silent flight and the hunting strategy of the Common Poorwill (*Phalenoptilus nuttallii*)

Hormones & Stress

P2-98 *Prado DMA, Gomes FR, Madelaire CB; São Paulo State University*
How Corticosterone Treatment Affects Testosterone Levels, Spermatogenesis and Wound Healing in the American Bullfrog

P2-99 *Molina EM, Mendonca MT; Auburn University*
Quantification of oxidative stress and baseline immunity to chronic exposure of low levels of DDT in two species of rodents: *Peromyscus maniculatus* and *Sigmodon hispidus*

P2-100 *Ryan TA, Taff CC, Zimmer C, Vitousek MN; Cornell University*
Relationships between weather and circulating glucose concentrations in tree swallows

P2-101 *Summers RR, Baker DM; University of Mary Washington*
Embryonic Development of the Stress Hormone Axis in Two Model Teleost Species

P2-102 *Christiano BM, Howey CAF; University of Scranton*
Do timber rattlesnakes with larger home ranges maintain higher baseline corticosterone levels?

P2-103 *Claunch NM, Schoenle LA, Oakey S, Downes C, Martin LB, Romagosa CM, Reed RN; University of Florida, Hamilton College, University of South Florida, United States Geological Survey*
Stress responses of an infamous island invader, *Boiga irregularis*

P2-104 *Simpson DY, Telemeco R, Langkilde T, Schwartz TS; Auburn University, California State University, Fresno, Pennsylvania State University*
Contrasting Differential Gene Expression to heat or fire ant envenomation in *Sceloporus undulatus*

P2-105 *Rubin AM, Wada H; Auburn University*
Effects of Periodic Cooling During Incubation on Heart Rate and Hatchling Morphology in Zebra Finches

P2-106 *Wright SK, Lambert FN, Wood MW, Alba A, Fontenot DK, Wheaton CJ; Disney's Animal Kingdom*
Fecal Corticosterone Evaluation of Individual Potential Translocation Candidacy in Threatened Avian Species

P2-107 *Lynn SE, Kern MD; The College of Wooster*
Characterizing the effects of early life cooling on HPA axis development in free-living songbirds

P2-108 *Robicheaux JR, Almond GF, Perkins HR, Goff CB, Forsburg ZR, Gabor CR; Texas State University*
Validating and Using Water-Borne Hormone Methods with Tadpoles: ACTH Challenge, Recovery Time, Repeatability, and Optimal Rearing Designs

P2-109 *Grant AR, Malisch JL, Kimball MG, Ouyang JQ; University of Nevada, Reno, St. Mary's College of Maryland*
Glucocorticoid physiology, territory size, and number of chicks fledged: Untangling the relationship between corticosterone and reproductive success

P2-110	*Pujade Busqueta L, Deyarmin JS, McCormley MC, Champagne CD, Crocker DE, Houser DS, Khudyakov JI; Univ of the Pacific, Natl. Marine Mammal Foundation, Sonoma State Univ*	Development of a Biomarker Panel of Stress in Free-ranging Marine Mammals
P2-111	*Deyarmin JS, McCormley MC, Champagne CD, Stephan AP, Pujade Busqueta L, Crocker DE, Houser DS, Khudyakov JI; Univ of the Pacific, Univ of Washington Bothell, Sonoma State Univ, National Marine Mammal Foundation*	Distinct blubber proteome responses to single and repeated ACTH challenges in a marine mammal
P2-112	*Santymire RM, Sacerdote-Velat AB, Gygli A, Keinath DA, Poo S, Hinkson KM, Mack-McKeag EM; Lincoln Park Zoo, The Chicago Academy of Sciences, US Fish and Wildlife Service, Memphis Zoo*	Investigating the stress physiology of Wyoming toads (*Anaxyrus baxteri*) using dermal cortisol analysis among various environmental conditions
P2-113	*Slack KL, Vangorder-Braid JT, Sirman AE, Heidinger BJ; Mississippi State Universtiy, North Dakota State University*	Does experimentally elevated stress exposure influence heterophil-lymphocyte ratios in developing chicks?
P2-114	*Sirman AE, Kucera AC, Kittilson J, Heidinger BJ; North Dakota State University*	Does chronic stress impact insulin-like growth factor signaling in house sparrows?
P2-115	*Vangorder-Braid JT, Sirman AE, Ghimire A, Kittilson J, Heidinger BJ; North Dakota State University*	Does Chronic Stress Exposure Influence TERT Expression and Telomere Loss in Developing House Sparrow Nestlings (*Passer domesticus*)?
P2-116	*Dees LH, Hoffman AJ, Wada H; Auburn High School*	Alteration of eggshell characteristics due to maternal heat stress

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P2-117	*Maenaga ML, Formica VA, Novarro AJ; Swarthmore College*	Eat or Be Eaten: Exploring the Relationship Between Stress Response and Cannibalism in Beetle Larvae
P2-118	*Alvarez Y, Adams NL; California Polytechnic State University*	Mother knows best: Maternal investment causes differences in UV-tolerance of intertidal and subtidal populations of sea urchins
P2-119	*Assis VR, Gardner S, Gomes FR, Mendonça MT; University of Sao Paulo, Auburn University*	Gene Expression of Proinflammatory Cytokines: How are Cane Toads Dealing with Infections under Acute Stress Situations?
P2-121	*Chrisler AD, Grant A, Kimball MG, Capasso DM, Johnson EE, Malisch JL; St. Mary's College of Maryland, University of Nevada, Reno*	Predictors of glucocorticoid and glucose mobilization in response to an acute handling challenge in Mountain White-crowned Sparrows (*Zonotrichia leucophrys oriantha*)
P2-122	*Kimball MG, Chrisler AD, Grant A, Malisch JL; St. Mary's College of Maryland, Univ of Nevada, Reno*	Acute stress and glucose mobilization in Mountain Dark-eyed Juncos (*Junco hyemalis*)
P2-123	*Lazenby-Choi M, Rubin AR, Wada H; Auburn University*	Effects of Incubation Temperatures on Beak Coloration Development in Zebra Finches
P2-125	*Fuller RG, Gormally BM, Romero LM; Tufts University*	An attention-occupying feeding mechanism does not affect glucocorticoid secretion in captive house sparrows (*Passer domesticus*)
P2-126	*Littler AS, Sriram A, Garcia MJ, Teets NM; University of Kentucky*	Out in the Cold: Genetic Correlation of Cold Tolerance Traits in *Drosophila Melanogaster*
P2-127	*Carrier TJ, Reitzel AM; Univ North Carolina, Charlotte*	Ecological Masking of Animal-Associated Bacterial Communities
P2-128	*Bilyk KT, Cheng CHC; Western Kentucky University, University of Illinois at Urbana Champaign*	Evolutionary Impacts of Chronic Cold on the Antarctic Notothenioid Chaperome and its Regulatory Mechanisms

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P2-130	*Swain KC, Lane Z, Zardus JD; The Citadel, Univ S. Mississippi*	Barnacles in Motion: A New Method for Rearing and Maintaining Barnacles in the Laboratory
P2-130.5	*Goetz SM, Piccolomini S, Hoffman M, Bogan J, Holding ML, Mendonca MT*, Steen DA; Auburn Univ, Central Florida Zoo & Botanical Gardens, Florida State University, Georgia Sea Turtle Center, Jekyll Island Authority*	Serum-based Inhibition of Pitviper Venom by Eastern Indigo Snakes
P2-131	*Danziger A, Frederich M; University of New England*	Using eDNA and FlowCam Analyses for Green Crab Monitoring

P2-132 *Grosskopf SM, McAlister JS; College of the Holy Cross* Investigating Potential Macroalgal Diets for Larvae of the Sea Urchin *Arbacia punctulata*

P2-133 *Reilly ME, Zardus JD; College of Charleston, The Citadel* Impact of Salinity on Larval Survival and Settlement in the Commensal Barnacle *Chelonibia testudinaria*

P2-134 *Caruso JP, Podolsky RD*; Salem State University, College of Charleston* Effects of personal care product preservatives on the larval development and growth of sea urchins (*Arbacia punctulata*)

P2-135 *Lowder KB, Taylor JRA; Scripps Institution of Oceanography, UC San Diego* The fountain of youth is chilly: California spiny lobster larvae progress faster in warmer water despite decreases in acidity

P2-136 *Bouchard SS, Broderick GA, Kimberly EC; Otterbein University* Competition and predation induce changes in metabolic rate and organ size in red-eyed treefrog larvae

P2-137 *Birch S, Plachetzki D; University of New Hampshire* The Genomic Characterization of Larval Settlement in the Biofouling Invertebrate *Ectopleura larynx*

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P2-139 *Estes SK, Austin MC, Mandelare PE, Paig-Tran EWM, Loesgen S, Strother JA; Oregon State University, California State University, Fullerton* The Microbiota of Marine Fishes Produce Neuroactive Secondary Metabolites

P2-140 *Lopez KE, Chavez-Dozal AA, Yu W, Salas SS, Rami R, Nishiguchi MK; New Mexico State University, Laboratoire Arago* 'You talkin to me?' Interspecies communication fosters collaboration between closely related symbionts in the sepiolid squid-*Vibrio* mutualism

P2-142 *Shirley K, Osborn A, Chambers C, Ambrose A, Markland S, Twombly Ellis J, Gonzalez VH, Kantsa A, Petanidou T, Tscheulin T, Barthell JF, Hranitz JM; Colorado College, The College of New Jersey, Univ of Kansas, Savannah State Univ, Oklahoma State Univ, Cornell Univ, Univ of the Aegean, Univ of Central Oklahoma, Bloomsburg Univ of Pa* A Plant–Pollinator Network in a Coastal Agricultural Field on Lesvos Island, Greece

P2-143 *Venkateswaran V, Kumble LK, Borges RM; Indian Institute of Science* Resource Dispersion influences Dispersal Evolution of Highly Insulated Insect Communities

P2-144 *Clardy TR, Heinle MJ, Thomas BK, Al-Nuwairah MA, Das PB, Qurban MA, Hikmawan TI, Prihartato PK, Abdulkader KA; King Fahd University of Petroleum and Minerals, Environmental Protection Department, Saudi Aramco* Response of zooplankton to a phytoplankton bloom in coastal waters of the Western Arabian Gulf

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P2-145 *Sayavong N, Gunderson AR, Stillman JH, Tsukimura B; California State University, Fresno, Tulane University, San Francisco State University* Effects of interspecific interactions, increased population density, and thermal stress on vitellogenesis on intertidal crabs *Petrolisthes cinctipes* and *P. manimaculus*

P2-146 *Nash SB, Rahman MDS; University of Texas Rio Grande Valley* Consequences of high temperatures on gonadal functions, cellular apoptosis and oxidative stress in the American oyster

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P2-150 *Deconinck AD, Nielsen ME, Hill CA, Emann W, Kingsolver JG; University of North Carolina--Chapel Hill, Princeton Day School* None Like It Hot: Larvae Move to Avoid Hot but Not Cold Temperatures, Regardless of Rearing Temperatures

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P2-155 *Meckel S, Ladner R, Williams JB*; Southern Illinois University Edwardsville* Diurnal temperature variation enhances survival and potential fecundity in the overwintering goldenrod gall fly, *Eurosta solidaginis*

P2-156 *Lamptey DI, Colombo RE, Menze MA, Martinez E; Eastern Illinois University, University of Louisville* — in the Heat of the Moment: Physiological Tradeoffs of Fishes Living in Warming Waters.

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P2-158 *Haro D, Burke RL, Pauly GB, Liwanag HEM; California Polytechnic State University, Hofstra University, Natural History Museum of Los Angeles* — Cold tolerance plasticity and cold acclimation of non-native Italian wall lizard (*Podarcis siculus*) populations from New York and California

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P2-164 *Porter N, Jost JA*; Bradley University* — Examining potential links between temperature stress and antioxidants in the invasive zebra mussel

P2-165 *O'Connor E, Cornelius E, Vézina F, Jimenez AG; Colgate University, Université du Quebéc à Rimouski* — Environmental Mismatch During Cold Shock in Black-capped Chickadees and Its Effects on Muscle Ultrastructure.

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P2-180 *Hefele KR, Celec S, Jorgensen DD; Roanoke College* — Cardiac Function in the American lobster: How Does Pericardial Sinus Pressure Relate to Pressure Inside the Heart?

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P2-182 *Schwieterman GD, Winchester MM*, Shiels HA, Marshall HM, Bushnell PG, Brill RW, Bernal D; Virginia Institute of Marine Science, Univ of Massachusetts, Univ of Manchester, Atlantic White Shark Conservancy, Indiana University* — The Impact of Simulated Capture Stress on Elasmobranch Cardiac Function using Isolated Myocardial Strips

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P2-190 *Ballard EJ, Barrett LM, Dearolf JL, Thometz NM, Bryan A, Reichmuth C; Hendrix College, Univ of San Francisco, Alaska Dept. of Fish and Game, Univ of California, Santa Cruz* — Hybrid fibers in the bearded seal longissimus dorsi muscle

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P2-196 *Krinos AI, Medina DM, Hughey MC, Walke JB, Gajewski Z, Sarment LS, Belden LK; Virginia Tech, Vassar College, Eastern Washington University, University of Michigan* — An evaluation of the predictive potential of gene sequences for antifungal capacity of amphibian skin bacterial isolates

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P2-259 *Cohen KE, Ackles AL, Hernandez LP; University of Washington, Michigan State University, The George Washington University* Origin, heterochrony, and diversification of otocephalan epibranchial organs

P2-260 *Garcia Ramirez J, Robertson JC; Westminster College* Growth and Structure of Gill Rakers in Paddlefish (*Polyodon spathula*)

P2-261 *Robertson JC; Westminster College* Characterizing Gill Pigmentation in Paddlefish (*Polyodon spathula*)

P2-262 *Maie T, Christy RM; Univ of Lynchburg* Adhesive force and endurance during waterfall climbing in an amphidromous gobiid, *Sicyopterus japonicus* (Teleostei: Gobiidae): Ontogenetic scaling of novel locomotor performance

P2-263 *Lenard A, Perez A, Diamond SE; Case Western Reserve University* Urban nighttime-biased warming alters growth and developmental trajectories throughout ontogeny in a cosmopolitan butterfly species

P2-264 *Ford NT, Ford MP, Samaee M, Santhanakrishnan A; Oklahoma State University* Effects of varying inter-pleopod spacing to pleopod length ratio in metachronal swimming of crustaceans

Developmental Morphology

P2-265 *Herbst K, Scott K, Landberg T; Arcadia University* Effects of Drug and Rat Body Part on the Growth of Necrophagous Beetle *Dermestes maculatus*

P2-266 *Briggs-Hale JM, Root ZD, Medeiros DM; Univ of Colorado, Boulder* The Evolution of Jaw Joint Precursors in a Jawless Vertebrate

P2-267 *Griffin C, Botelho J, Hanson M, Fabbri M, Bhullar A; Virginia Tech, Yale University* The Avian Pelvis Possesses Ancestral Dinosaurian Character StatesEearly in Development

P2-268 *Fenner JL, Concha C, Counterman BA, McMillan W; Mississippi State University, Smithsonian Tropical Research Institute* Does the *Wnt* pathway Modulate Pigment and Structural Variation on Butterfly Wings?

P2-269 *Williams KL, Evans KM, Simons AM; University of Minnesota* A model for tooth replacement and tooth function in a terrestrial fish, *Alticus arnoldorum* (Blenniidae)

Molecular Evolution

P2-270 *Carlson BM, Hurtig JE, Szalay TE, Mullin MM; The College of Wooster* That's a Fish of a Different Color: Using a Candidate Gene Approach to Investigate Color Variation in *Betta splendens*

P2-271 *Hamm AR, Riley AG, Mullin MM, Eckerle BM, Lehtinen RM, Carlson BM; The College of Wooster* To Delete or Not to Delete: Examining the Role of *Mc1r* Deletions in Squirrel Melanism

P2-272 *Redak CA, Halanych KM; Auburn University* Mitochondrial genome of *Parborlasia corrugatus* (Nemertea: Lineidae)

P2-273 *Swafford AJM, Oakley TH; UC Santa Barbara* Opsin Family Macroevolution and the Origin of Light Sensitivity in GPCRs

P2-274 *Clegg DC, Chi RC, Reitzel AM; Univ of North Carolina, Charlotte* Characterization and Expression of Transcription Factors in the Circadian Clock of Cnidarians

P2-275 *Jones JL, Counterman B, Hoffmann F; Mississippi State University* Adaptive Evolution of Argonaute Genes in Lepidoptera Genomes

P2-276 *McKenna AJ, Smith A, Gibbs AG; Univ of Nevada, Las Vegas* Rapid Evolution of Starvation Resistance in Drosophila: Physiological and Molecular Mechanisms

P2-277 *Belfiore NM, Noordsij LC; University of Tampa* Comparative Genomics of Four Mustelid Species

P2-277.5 *Noordsij LC, Belfiore ; University of Tampa* Comparative Genomics of Four Mustelid Species: Analysis of LIF gene and its Role in Embryonic Diapause

P2-278 *Fontana RM, Chandler CH; SUNY Oswego* Identification of transposable elements in the genome of the terrestrial isopod *Trachelipus rathkei*

P2-279 *Doura NM, Chandler C; Suny Oswego* Sexually Dimorphic Gene Expression in Terrestrial Isopods

P2-280 *Perez-Galvez FR, Teets NM; University of Kentucky* Genetic and Environmental Factors Influencing the Efficacy of Transgenic Sterile Insect Technique

P2-281 *Kenny NJ, Riesgo A; The Natural History Museum, London* Evolution on Ice: 'Omic insights into Molecular Adaptation in Antarctic Sponges

P2-282 *Womack MC, Lemmon EM, Lemmon AR, Hoke KL; National Museum of Natural History, Florida State University, Colorado State University* Signatures of Relaxed Selection Characterize Earless Toad Lineages

P2-283 *Larter M, Dunbar-Wallis A, Berardi AE, Smith SD; University of Colorado, University of Bern* Evolution of floral pigmentation and regulation of the anthocyanin pathway in Iochrominae

P2-284 *Barreira SN, Baxevanis AD; NHGRI/NIH* Exploring the Role of Ribosomal Gene Repeats in the Context of Regeneration

P2-285 *Reitzel AM, Waller J, Knighton L, Strom O, Truman AW; Univ of North Carolina, Charlotte* Interactome Complexity and Dynamics Involving Hsp70 Proteins from the Anemone *Nematostella vectensis*

Sunday Schedule of Events

Events take place in the Tampa Convention Center, unless otherwise noted

EVENT	TIME	LOCATION
Poster Session 3 Set Up	7:00 AM – 8:00 AM	Exhibit Hall
Speaker Ready Room	7:00 AM – 5:00 PM	Room 11
Registration	7:30 AM – 3:00 PM	Central Exhibit Hall
Coffee Break AM	9:30 AM – 10:30 AM	Exhibit Hall
Exhibit Hall	9:30 AM – 5:30 PM	Exhibit Hall
Coffee Break PM	3:30 PM – 4:30 PM	Exhibit Hall
Poster Session 3 Even Numbers Authors Present	3:30 PM – 4:30 PM	Exhibit Hall
Poster Session 3 Odd Numbers Authors Present	4:30 PM – 5:30 PM	Exhibit Hall
Poster Session 3 Teardown	5:30 PM – 6:00 PM	Exhibit Hall

SYMPOSIA ORAL PRESENTATIONS

S7:	Comparative Evolutionary Morphology and Biomechanics in the Era of Big Data Chairs: Martha Muñoz, Samantha Price	7:45 AM – 3:30 PM	Room 16 & 17
S8:	Multifunctional Structures and Multistructural Functions: Functional Coupling and Integration in the Evolution of Biomechanical Systems Chairs: Stacy Farina, Emily Kane, Patricia Hernandez	7:45 AM – 3:30 PM	Room 21
S9:	Chemical Responses to the Biotic and Abiotic Environment by Early Diverging Metazoans Revealed in the Post-Genomic Age Chairs: Paul Long, Laura Mydlarz, Beth Okamura	7:45 AM – 3:30 PM	Room 18

CONTRIBUTED PAPER ORAL PRESENTATIONS

MORNING

Session 72: Complementary to S11: Size & Shape: Ontogenetic Origins of Organismal Form	8:00 AM – 9:45 AM	Room 1 & 2
Session 73: Animal Communication	8:00 AM – 9:45 AM	Room 3 & 4
Session 74: Ecological and Evolutionary Consequences of Metabolic Diversity 1	8:00 AM – 9:30 AM	Room 5 & 6
Session 75: Social Behaviors and Predator-Prey Interactions	8:00 AM – 9:30 AM	Room 13
Session 76: Ekoehlogical Biomechanics: A Tribute to Mimi Koehl, I	8:00 AM – 9:30 AM	Room 14 & 15
Session 77: Comparative Genomics	8:00 AM – 9:00 AM	Room 19
Session 78: Complementary to S5: Stress Phenotype: Linking Molecular, Cellular and Physiological Stress Responses to Fitness, I	8:00 AM – 9:45 AM	Room 20
Session 79: Swimming: It's a Drag	8:00 AM – 9:30 AM	Room 22
Session 80: Breaking the Surface	8:00 AM – 9:30 AM	Room 23
Session 81: Never Miss a Step	8:00 AM – 9:30 AM	Room 24
Session 83: Behavioral Physiology	8:00 AM – 9:30 AM	Room 12
Session 84: Complementary to S10: The World is Not Flat Accounting for the Dynamic Nature of the Environment as We Move Beyond Static Experimental Manipulations	10:15 AM – 12:00 PM	Room 1 & 2
Session 85: Hormones & Behavior 1 - An Avian Focus	10:15 AM – 12:00 PM	Room 3 & 4
Session 86: Developmental Plasticity	10:00 AM – 12:00 PM	Room 5 & 6
Session 88: Ekoehlogical Biomechanics: A Tribute to Mimi Koehl, II	10:00 AM – 11:45 AM	Room 14 & 15
Session 89: Complementary to S6: Beyond the Powerhouse: Integrating Mitonuclear Evolution, Physiology, and Theory in Comparative Biology	10:15 AM – 12:00 PM	Room 19
Session 90: Complementary to S5: Stress Phenotype: Linking Molecular, Cellular and Physiological Stress Responses to Fitness, II	10:15 AM – 12:00 PM	Room 20
Session 91: Meta-Swimming: Greater Than the Sum of Its Parts	10:00 AM – 12:00 PM	Room 22
Session 92: Flies in the Honey	10:00 AM – 12:00 PM	Room 23
Session 93: Gonna Get a Leg Up	10:00 AM – 11:45 AM	Room 24
Session 94: Adaptation	10:00 AM – 11:15 AM	Room 25
Session 95: Reproductive and Ontogenetic Physiology	10:00 AM – 12:00 PM	Room 12

AFTERNOON

Session 96: Pathology and Disease	1:30 PM – 2:45 PM	Room 1 & 2
Session 97: Hormones & Behavior II - Everything but the Birds	1:30 PM – 3:30 PM	Room 3 & 4
Session 98: Energetics of Endotherms: Seasonal and Evolutionary Patterns	1:30 PM – 3:30 PM	Room 5 & 6
Session 99: Muscle Physiology, II	1:30 PM – 3:15 PM	Room 13
Session 100: Ekoehlogical Biomechanics: A Tribute to Mimi Koehl, III	1:30 PM – 3:15 PM	Room 14 & 15
Session 101: Complementary to S6: Beyond the Powerhouse: Integrating Mitonuclear Evolution, Physiology, and Theory in Comparative Biology	1:30 PM – 3:15 PM	Room 19
Session 102: Complementary to S5: Stress Phenotype: Linking Molecular, Cellular and Physiological Responses to Fitness, III	1:30 PM – 3:15 PM	Room 20
Session 103: Whole Body Swimming Mechanics	1:30 PM – 3:30 PM	Room 22
Session 104: Stability & Maneuvering in a Low Re World	1:45 PM – 3:30 PM	Room 23
Session 105: Give and Go: Pushing Off and Moving Forward	1:30 PM – 3:15 PM	Room 24
Session 106: Life History Evolution	1:30 PM – 3:30 PM	Room 25
Session 107: Education and the Undergraduate	1:30 PM – 3:15 PM	Room 12

COMMITTEE AND BOARD MEETINGS

SICB Editorial Board	12:00 PM – 1:30 PM	Room 8
POs and Symposium Organizers for Austin Meeting	12:00 PM – 1:30 PM	Room 31-32
Development Committee	12:00 PM – 1:30 PM	Room 34

BUSINESS MEETINGS

SICB Society Meeting & Awards Presentation	5:30 PM – 6:30 PM	Room 14-15

WORKSHOPS AND PROGRAMS

Broadening Participation Committee Workshop: Creating a comfortable and welcoming learning community: from a strategic syllabus to realized student engagement	12:00 PM – 1:30 PM	Room 5-6
Student Support Committee Brown Bag Workshop for Graduate Students: Writing a competitive GIAR/FGST grant proposal	12:00 PM – 1:30 PM	Room 14-15
DPCB Ask-An-Expert: Get phylogenetic and comparative methods support with an expert	3:30 PM – 5:30 PM	Central Exhibit Hall
TAL-X Workshop: Identifying the core concepts of vertebrate morphology teaching: a means to enhance active learning and retention in the classroom	7:00 PM – 9:00 PM	Room 5-6

SOCIAL EVENTS

Broadening Participation Social	7:00 PM – 9:00 PM	Il Terrazzo, Marriott

Sunday Program Symposia

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

7:45 AM – 3:30 PM **Session S7** **Room 16 & 17**

Comparative Evolutionary Morphology and Biomechanics in the Era of Big Data

Chairs: Martha Muñoz, Samantha Price

7:45 am	**S7-1**	*Muñoz MM, Patek SN; Virginia Tech, Duke*	Biomechanics as a Pacemaker for Evolutionary Diversity
8:00 am	**S7-2**	*Santana SE, Arbour JH, Curtis AA, Stanchak KE; Univ of Washington*	Integrating Traditional and Modern Approaches to Study Morphological Evolution in Bats: Where Is The Point of Diminishing Returns?
8:30 am	**S7-3**	*Evans KM, Williams K, Westneat M; University of Minnesota, University of Chicago*	Do coral reefs act as a crucible for morphological innovation? A critical reappraisal of the effect of coral reef habitats on the evolution of morphological diversity in wrasses in the era of big data.
9:00 am	**S7-4**	*Wright NA, Witt CC, Tobalske BW; Kenyon College, University of New Mexico, University of Montana*	Biomechanics of Flight Across the Avian Tree
9:30 am	**S7-5**	*Martinez CM, McGee MD, Borstein SR, Sparks JS, Wainwright PC; University of California, Davis, Monash University, University of Tennessee, American Museum of Natural History*	Scaling Up Kinematics: A Geometric Approach for Studying the Evolution of Biological Motions
10:00 am		**Coffee Break**	**Exhibit Hall**
10:30 am	**S7-6**	*Bright JA; University of South Florida, Tampa*	A Holistic Approach to the Evolution of Feeding in Birds
11:00 am	**S7-7**	*McHorse BK, Biewener AA, Pierce SE; Harvard University*	Modeling the Causes and Consequences of Digit Reduction in Extinct Horses
11:30 am	**S7-8**	*Baliga VB, Mehta RS; University of British Columbia, Univ of California*	Macroevolutionary insights from independent origins of cleaning behavior around the world: synthesizing morphology, ecology and biogeographic patterns
12:00 pm		**Lunch Break**	
1:30 pm	**S7-9**	*Sherratt E, Sanders KL; The University of Adelaide*	Tiny heads: the evolution of microcephalic sea snakes
2:00 pm	**S7-10**	*Felice RN, Tobias JA, Goswami A; University College London, Imperial College London, The Natural History Museum*	How Dietary Niche Shapes Macroevolution in the Avian Skull
2:30 pm	**S7-11**	*Price SA, Corn KA, Friedman ST, Larouche O, Martinez CM, Zapfe K, Wainwright PC; Clemson University, Univ of California, Davis*	The fish shapes project. Harnessing the power of data science, museum collections and undergraduate researchers to quantify body shape evolution across teleost fishes.
3:00 pm	**S7-12**	*Alfaro ME, Karan EA, Chang J, Woo LK; UCLA*	High Throughput Phenoscaping for Comparative Studies
3:30 pm		**Coffee Break**	**Exhibit Hall**

7:45 AM – 3:30 PM **Session S8** **Room 21**

Multifunctional Structures and Multistructural Functions: Functional Coupling and Integration in the Evolution of Biomechanical Systems

Chairs: Stacy Farina, Emily Kane, Patricia Hernandez

7:45 am	**S8-1**	*Farina SC, Kane EA, Hernandez LP; Howard University, Georgia Southern University, George Washington University*	Multifunctional Structures and Multistructural Functions: Functional Coupling and Integration in the Evolution of Biomechanical Systems
8:00 am	**S8-2**	*Stayton CT; Bucknell University*	Moving beyond the peaks: combining multivariate performance surfaces in studies of ecomorphological diversification

8:30 am	**S8-3**	*Feilich KL, Lopez-Fernandez H; Univ of Michigan*	What do we assume when we ask ecomorphological questions?
9:00 am	**S8-4**	*Goswami A, Watanabe A, Felice RN, Bardua C, Fabre AC, Polly PD; Natural History Museum, New York Institute of Technology, University College London, Indiana University*	Phenomic approaches to analysing integration in complex systems and across diverse taxa: the good, the bad, and the ugly
9:30 am	**Coffee Break**		**Exhibit Hall**
10:00 am	**S8-5**	*Farina SC; Howard University*	Is functional coupling really so constraining? The role of coupling in the evolution of functional anatomical systems
10:30 am	**S8-6**	*Friedman NicholasR, Economo EvanP; Okinawa Institute of Science and Technology*	A morphological integration perspective on the evolution of dimorphism among sexes and social castes
11:00 am	**S8-7**	*Evans KM, Taylor S, Fenolio DB; University of Minnesota, San Antonio Zoo*	Bony patchwork: Mosaic Patterns of Evolution in the Teleost Skull
11:30 am	**S8-8**	*Arbour JH, Curtis AA, Santana SE; University of Washington, UW/Burke Museum*	Macroevolutionary Dynamics of Cranial and Mandible Shape in Bats
12:00 pm	**Lunch Break**		
1:30 pm	**S8-9**	*Higham TimothyE, Schmitz L, Clark RW; Univ of California, Riverside, Claremont McKenna, Scripps, and Pitzer Colleges, San Diego State Univ*	Dynamic functional Integration in organismal biology: Integrating motor and sensory systems during predator-prey interactions
2:00 pm	**S8-10**	*Kane EA, Cohen HE, Marshall CD; GA Southern University, TX A&M University, Galveston*	Beyond Suction-Feeding Fishes: Diverse Strategies for Integrating Functional Systems During Prey Capture in Vertebrates
2:30 pm	**S8-11**	*Hernandez LP, Cohen KE; The George Washington University, Univerisity of Washington*	Multifunctional structures and multistructural functions: How these phenomena characterize the evolution of morphological novelties within Cypriniformes
3:00 pm	**S8-12**	*Farina SC; Howard University*	Panel Discussion: New Perspectives on Integration in Functional Morphology
3:30 pm	**Coffee Break**		**Exhibit Hall**

7:45 AM – 3:30 PM **Session S9** **Room 18**

Chemical Responses to the Biotic and Abiotic Environment by Early Diverging Metazoans Revealed in the Post-Genomic Age

Chairs: Paul Long, Laura Mydlarz, Beth Okamura

7:45 am	**S9-1**	*Okamura B; Natural History Museum, London*	Introduction
8:00 am	**S9-2**	*Oakley TH, Picciani N, Swafford AJ; University of California, Santa Barbara*	Multi-modal sensory systems and the journey to the origin of animal phototransduction
8:30 am	**S9-3**	*Ryan JF, Bobkov YV, Babonis LS; Whitney Laboratory for Marine Bioscience*	Reframing the origin of neurons
9:00 am	**S9-4**	*Leys SP, Mah JL, Kahn AS; University of Alberta, Monterey Bay Aquarium Research Institute, Yale University*	Sense and Sensitivity in Sponges: a functional and genomic view
9:30 am	**Coffee Break**		**Exhibit Hall**
10:00 am	**S9-5**	*Paul VJ, Freeman CJ, Agarwal V; Smithsonian Institution, Georgia Institute of Technology*	Chemical Ecology of Marine Sponges
10:30 am	**S9-6**	*Long PF, Doonan LB, Gacesa R, Hartigan A, Jaimes-Becerra A, Marques AC, Okamura B; King's College London, University Medical Center Groningen, Natural History Museum, London, Universidade de São Paulo*	Beyond Primary Sequence' – Relating Lifestyles to Variation in Cnidarian Venom
11:00 am	**S9-7**	*Winnikoff JR, Wilson TM, Bachtel TS, Francis WR, Budin I, Thuesen EV, Haddock SHD; Monterey Bay Aquarium Research Institute, The Evergreen State College, University of Southern Denmark, Odense, University of California, Berkeley*	Combing Transcriptomes for Secrets of Survival in the Deep Sea

11:30 am	**S9-8**	*Gochfeld DJ; Univ of Mississippi*	Phenotypic plasticity in chemical defense in sponges and corals
12:00 pm	**Lunch Break**		
1:30 pm	**S9-9**	*Mydlarz LD; University of Texas Arlington*	Insights into coral disease and innate immune signaling using genomic and proteomic approaches
2:00 pm	**S9-10**	*Doonan LB, Hartigan A, Gacesa R, Okamura B, Marques AC, Long PF; Kings College London, Natural History Museum London, University Medical Center Groningen, Universidade de São Paulo*	Feeling Stressed? The Evolution of Nrf2 Coordinated Oxidative Stress Response in Free-living and Parasitic Cnidarians.
2:30 pm	**S9-11**	*Traylor-Knowles NG, Vandepas L, Browne WE; University of Miami, University of Washington*	Ctenophore Immunity: A Journey Into The Unknown
3:00 pm	**S9-12**	*Weis VM; Oregon State University*	in Sickness and in Health: The Role of Innate Immunity in the Regulation of Cnidarian-Dinoflagellate Mutualisms
3:30 pm	**Coffee Break**		**Exhibit Hall**

Sunday Program Morning Sessions

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

8:00 AM – 9:45 AM **Session 72** **Room 1 & 2**

Complementary to S11: Size & Shape: Ontogenetic Origins of Organismal Form

Chairs: Ken McKenna, Austin McKenna

8:00 am	**72-1**	*Yegian AK; Harvard University*	Bigger Bipeds, Shorter Arms: Inter-Limb Scaling in Hominins and Theropod Dinosaurs
8:15 am	**72-2**	*Jayne BC, Bamberger AL*; Univ Cincinnati*	The Big Gulp: Morphological Determinants and Scaling Relationships of Gape in Two Invasive Species of Large Snakes
8:30 am	**72-3**	*Green TL, Wilbourn JL, O'Brien HD, Gignac PM; Oklahoma State University*	Allometry of Common Ostrich (*Struthio camelus*) Ophthalmic Retia
8:45 am	**72-4**	*Allen PE, Miller CW; University of Florida*	Environmental and Genetic Factors Contribute to the Divergence in Weaponry Across a Broad Landscape
9:00 am	**72-5**	*Thompson DB; University of Nevada, Las Vegas*	The Ontogeny of Static Allometry is Not So Simple for Grasshoppers: Genetic Variation for Nutrient Sensitive Plasticity is Masked by Size-Dependent Compensatory Growth
9:15 am	**72-6**	*Palmer RM, Nijhout HF; Duke University*	Morphological Murals: The Scaling and Allometry of Butterfly Wing Patterns
9:30 am	**72-7**	*Kircher BK, Cohn MJ; University of Florida*	Development of a Sexually Dimorphic Character in Anole Lizards
9:45 am	**Coffee Break**		**Exhibit Hall**

8:00 AM – 9:45 AM **Session 73** **Room 3 & 4**

Animal Communication

Chair: Talia Moore

8:00 am	**73-1**	*Freeman AR, Sheehan MJ, Ophir AG; Cornell University*	Anogenital distance predicts sexual odour preference in African giant pouched rats
8:15 am	**73-2**	*Hensley NM, Ellis EA, Gerrish GA, Torres E, Frawley JP, Oakley TH, Rivers TJ; Univ of California, Santa Barbara, Univ of Wisconsin, California State Univ, Los Angeles, Univ of Kansas*	Phenotypic evolution shaped by current enzyme function in the bioluminescent courtship signals of sea fireflies
8:30 am	**73-3**	*Moore TY, Bruder DK, Davis Rabosky AR, Vasudevan R; Unversity of Michigan*	Decoupling coupled anti-predator signals with a bio-inspired snake robot

8:45 am	**73-4**	*Sasson DA, Jocson D, Fowler-Finn KD; Saint Louis University, Washington State University*	The thermal sensitivity and quantitative genetics of mate attraction signals and preferences in the treehopper, *Enchenopa binotata*
9:00 am	**73-5**	*Parmentier E, Raick X, Vigouroux R, Mélotte G; Univ of Liège, HYDRECo*	Birth and Evolution of Acoustic Communication in Piranhas (Serrasalmidae)
9:15 am	**73-6**	*Nuñez CMV, Rubenstein DI; Iowa State University, Princeton University*	Mother-infant communication in feral horses (Equus caballus): what are they saying, why are they saying it, and what might it tell us about the mammalian juvenile stage?
9:30 am	**73-7**	*Kéver L, Bass AH, Parmentier E, Chagnaud BP; Université de Liège, Cornell University, Ludwig-Maximilians-University Munich*	A Common Neural Substrate for Sonic and Electric Signaling in Synodontid Catfish

9:45 am ..... **Coffee Break** ..... **Exhibit Hall**

8:00 AM – 9:30 AM Session 74 Room 5 & 6

Ecological and Evolutionary Consequences of Metabolic Diversity 1

Chairs: Meghan Duell, Erika Eliason

8:00 am	**74-1**	*Wong S, Bigman JS, Dulvy NK; Simon Fraser University*	The metabolic basis of life histories in fishes
8:15 am	**74-2**	*Johnson B, Searle J, Sparks J; Cornell University*	Morphological Drivers of Physiological Performance in Lungless Salamanders
8:30 am	**74-3**	*Eliason EJ; University of California, Santa Barbara*	Mechanisms underlying sex-specific mortality in Pacific salmon
8:45 am	**74-5**	*Duell ME, Harrison JF; University of Western Ontario, Arizona State University*	The pros & cons of small size: Size-dependent flight metabolic rates and thermal performance among stingless bees
9:00 am	**74-6**	*Spence AR, Tingley MW; University of Connecticut*	Response to novel thermal and hypoxic challenges from populations across a hummingbird's elevational range
9:15 am	**74-7**	*Bigman JS, Pardo SA, Prinzing TS, Wegner NC, Dulvy NK; Simon Fraser University, Dalhousie University, National Marine Fisheries Service*	Ecological lifestyles and the scaling of shark gill surface area

9:30 am ..... **Coffee Break** ..... **Exhibit Hall**

8:00 AM – 9:30 AM Session 75 Room 13

Social Behaviors and Predator-Prey Interactions

Chair: Brett Seymoure

8:00 am	**75-1**	*Kloepper LN, Brighton CB, McGowan K, Zusi L, Taylor GK; Saint Mary's College, Oxford University*	Predator-prey kinematics of a specialized population of Swainson's hawks, *Buteo swainsoni* and Brazilian free-tailed bats, *Tadarida brasiliensis*
8:15 am	**75-2**	*McAlpine-Bellis E, Gibb AC; Friday Harbor Labs, Northern Arizona University*	Color Change and Movement Analysis of the Pacific Staghorn Sculpin, *Leptocottus armatus*
8:30 am	**75-4**	*Costa DP, Kienle SS, Trumble SJ, Kanatous S, Goebel ME, Krause D; Univ of California, Santa Cruz, Baylor University, Colorado State University, NOAA Southwest Fisheries Science Ctr*	Foraging Ecology of the Leopard Seal
8:45 am	**75-5**	*Venable CP, Langkilde TL; The Pennsylvania State University*	Eating toxic invasive ants turns lizards off eating native ants
9:00 am	**75-6**	*Rivest EB, Jellison BM, Ng G, Satterthwaite EV, Bradley HL, Williams SL, Gaylord B; Virginia Institute of Marine Science, Bowdoin College, Univ of California, Davis, James Madison University*	Effects of Global Environmental Change on Marine Systems: Insights from Sensory Ecology
9:15 am	**75-7**	*Anderson RA, McBrayer LD; Western Washington University, Georgia Southern University*	Long term patterns of habitat use and prey use in a dietary specialist

9:30 am ..... **Coffee Break** ..... **Exhibit Hall**

8:00 AM – 9:30 AM **Session 76** **Room 14 & 15**

Ekoehlogical Biomechanics: A Tribute to Mimi Koehl, I

Chair: Emily Carrington

8:00 am	**76-1**	*Rosa M, Padilla DK*; Conneticut College, Stony Brook University, Stony Brook University*	When Size Doesn't Matter: Food Choice By Bivalve Larvae
8:15 am	**76-2**	*Michaelis BT, Reidenbach M; University of Virginia, University of Virginia*	Smelling time: using temporal variability in chemical cues to aid odor-mediated search by lobsters
8:30 am	**76-3**	*Waldrop LD, He Y, Khatri S; New Mexico Tech, UC Merced*	Hairy noses and fast computers: exploring odor capture with hair arrays using computational modeling
8:45 am	**76-4**	*Davidson LA; University of Pittsburgh*	Mechanical Design in the Embryo: M.A.R.K.-Style Dissection of Functional Mechanical Contributions from Laminar Sheet to Molecular Complex.
9:00 am	**76-5**	*Grunbaum D, Emlet R; Univ Washington, OIMB*	The Function of Minimalist Morphologies: Swimming Performance of Blastulae, Gastrulae and Other Spheroidal Organism Architectures
9:15 am	**76-6**	*Carrington E; University of Washington*	Environmental Safety Factor: a framework for evaluating physiological performance in an ecological context

9:30 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:00 AM **Session 77** **Room 19**

Comparative Genomics

Chairs: Ryan McCleary, Christine Schnitzler

8:00 am	**77-1**	*Choudhury M, McCleary RJR*, Kesherwani M, Kini RM, Velmurugan D; University of Madras, Stetson University, University of Madras, National University of Singapore*	A Multi-Technique Comparison of the Venoms of Two Medically-Important Elapid Snakes, the Indian Cobra (*Naja naja*) and the Common Krait (*Bungarus caeruleus*)
8:15 am	**77-2**	*Debiasse MB, Babonis LS, Koren S, Schnitzler CE, Martindale MQ, Ryan JF; Whitney Lab for Marine Bioscience, National Human Genome Research Institute*	The complete genome sequence of *Beroe ovata*, a tentacle-less, ctenophore-chomping ctenophore
8:30 am	**77-3**	*Lower SE, Fallon TR, Chang C, Bessho-Uehara M, Martin GJ, Bewick AJ, Behringer M, Debat HJ, Wong I, Day JC, Suvorov A, Silva ; Bucknell University, Massachusetts Institute of Technology, University of Rochester, Chubu University, Brigham Young University, University of Georgia, Arizona State University, National Institute of Agricultural Technology, Centre for Ecology and Hydrology, University of California Davis*	Firefly genomes illuminate parallel origins of bioluminescence in beetles
8:45 am	**77-5**	*Schnitzler CE, Nguyen AD, Koren S, Gahan JM, Barreira S, Sanders SM, Phillippy A, Mullikin J, Cartwright P, Nicotra M, Frank U, Baxevanis AD; Whitney Lab, University of Florida, NHGRI, NIH, SARS, University of Pittsburgh, University of Kansas, NUI-Galway*	New Kid on the Block: Placing the *Hydractinia* Genome within the Context of Established Cnidarian Genomes

9:00 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:45 AM **Session 78** **Room 20**

Complementary to S5: Stress Phenotype: Linking Molecular, Cellular and Physiological Stress Responses to Fitness, I

Chair: Morgan Kelly

8:00 am	**78-1**	*Mottola G, Vasemägi A, Nikinmaa M, Anttila K; University of Turku, Swedish University of Agricultural Science*	Phenotypic plasticity of thermal tolerance in three-spined sticklebacks (Gasterosteus aculeatus) from natural and thermally polluted areas
8:15 am	**78-2**	*Lavergne SG, Seguin J, Boudreau M, Murray D, Krebs CJ, McGowan PO, Boonstra R; Univ of Toronto, Trent University, Univ of British Columbia*	Neurobiology of risk: Prenatal effects of predation risk in snowshoe hares

8:30 am	**78-3**	*Goodchild CG, Womble B, Grindstaff JL, Durant SE; Oklahoma State University, University of Arkansas*	A novel approach to measuring oxidative stress in avian red blood cells links heme degradation to senescence
8:45 am	**78-4**	*Grace JK, Anderson DJ, Angelier F; Texas A&M University, Wake Forest University, Centre d'Etudes Biologiques de Chize, CNRS*	Long-term Effects of Early-life Stress on the HPA Axis in a Short- and Long-lived Bird
9:00 am	**78-5**	*Sirovy KA, Kelly MW; Louisiana State University*	Intraspecific variation in the stress response of the Eastern Oyster, *Crassostrea virginica*, to salinity changes within the northern Gulf of Mexico
9:15 am	**78-7**	*Ragsdale AK, Miller K, Colombo RE, Menze MA, Schrey AW*; University of Otago, Georgia Southern University, Eastern Illinois University, University of Louisville*	DNA Methylation is Altered in Bluegill Sunfish, *Lepomis macrochirus*, as Consequence of Anthropogenic Thermal Stress
9:30 am	**78-8**	*Assis VR, Gardner S, Smith KM, Gomes FR, Mendonça MT; University of Sao Paulo, Auburn University*	Stress, Dispersal, and Immunity: Field Comparisons of the Florida Populations of the Cane Toad

9:45 am ..... **Coffee Break** ..... **Exhibit Hall**

8:00 AM – 9:30 AM Session 79 Room 22

Swimming: It's a Drag

Chairs: Kevin Du Clos, Amy Lang

8:00 am	**79-1**	*Du Clos KT, Lang A, Devey S, Motta PJ, Habegger ML, Gemmell BJ; University of South Florida, University of Alabama, Florida Southern College*	Flexible scales of the mako shark respond to drag inducing small-scale flow features
8:15 am	**79-2**	*Lang A, Santos L, Bonacci A, Devey S, Parsons J, Motta P, Habegger M; Univ of Alabama, Univ of South Florida, Florida Southern College*	Experimental Evidence of Flow Separation Control Leading to Decreased Drag by Shark Scale Bristling
8:30 am	**79-3**	*Lauder GV, Wainwright DK, Saadat M, Domel AG, Domel G, Weaver JC, Ankhelyi MV, Popp M, Wen L, Bertoldi K; Harvard Univ, Notre Dame Univ, Beihang Univ*	Shark Skin: Three-Dimensional Structure and Hydrodynamic Function
8:45 am	**79-4**	*Wu C, Howle LE, McGregor AE, McGregor R, Nowacek DP; Duke University, University of Glasgow, High Def Aerial Surveying Ltd*	Computational fluid dynamics simulations of a 10m North Atlantic right whale (*Eubalaena glacialis*)
9:00 am	**79-5**	*Kennedy JH, Sienkiewicz R, Fish F, Goldbogen JA, Potvin J; Saint Louis University, West Chester University, Hopkins Marine Station-Stanford University*	Computational Fluid Dynamics Study of Baleen Whale Drag
9:15 am	**79-6**	*Hassanalian M, Waldrop L, Bakhtiyarov S; New Mexico Institute of Mining and Technology*	Thermal impacts of body colorization of marine animals on their skin friction drag

9:30 am ..... **Coffee Break** ..... **Exhibit Hall**

8:00 AM – 9:30 AM Session 80 Room 23

Breaking the Surface

Chairs: Andrew Dickerson, Brian Chang

8:00 am	**80-1**	*Watson DA, Kahn HA, Diamco RC, Dickerson AK; University of Central Florida*	On the survival of water striders during raindrop impacts
8:15 am	**80-2**	*Unsworth CK, Tarchick MJ, McInerney SJ, Astley HC; University of Akron*	The Effects of Crocodilian Tail Serrations on Surface Water Disturbance
8:30 am	**80-3**	*Fish FE, Nicastro AJ, St. Leger J; West Chester Univ, Sea World*	Spin-leap Performance by Cetaceans Is Influenced by Moment of Inertia
8:45 am	**80-4**	*Chang B, Myoung J, Virot E, Clanet C, Kim HY, Jung S; Virginia Tech, Seoul National University, Harvard University, LadHyX, Cornell University*	How Aquatic Animals Jump Out of Water
9:00 am	**80-5**	*Whitehead JG, Socha JJ; Virginia Tech*	Do mallards landing on water exhibit tau theory strategies?
9:15 am	**80-6**	*Lee AB, Seleb B, Hanlon L, Sun A, Hu DL; Georgia Institute of Technology*	Preventing bubble pinch-off in underwater sniffing

9:30 am ..... **Coffee Break** ..... **Exhibit Hall**

8:00 AM – 9:30 AM **Session 81** **Room 24**

Never Miss a Step

Chair: Benjamin McInroe

8:00 am	**81-1**	*Quinn BL, Xi SY, Hsieh ST; Temple University, Harriton High School, Temple University*	Can learning facilitate perturbation recovery following limb loss in tarantulas?
8:15 am	**81-2**	*McInroe B, Libby T, Koditschek DE, Full RJ; UC Berkeley, U Washington, U Penn*	Identifying Control Modules in Complex, Dynamic Behaviors by Using Ground-righting in Geckos
8:30 am	**81-3**	*Jayaram K, Doshi N, Wood R; Harvard University*	Gait recovery using proprioceptive feedback in HAMR, a biologically-inspired robotic platform
8:45 am	**81-4**	*Goldsmith H, Daley MA*; Royal Veterinary College*	Dynamics of turning maneuvers on high and low friction terrain in helmeted guinea fowl (*Numida meleagris*)
9:00 am	**81-5**	*Schwaner MJ, Freymiller GA, Whitford MD, Higham TE, Clark RW, McGowan CP; University of Idaho, San Diego State University, University of California*	Tail Rotation Facilitates Active Body Reorientation during Escape Responses in Kangaroo Rats (*D. deserti*)
9:15 am	**81-6**	*McElroy EJ, McBrayer LD; College of Charleston, Georgia Southern U.*	Defining acceleration performance during burst locomotion in running animals

9:30 am **Coffee Break** **Exhibit Hall**

8:00 AM – 9:30 AM **Session 83** **Room 12**

Behavioral Physiology

Chairs: Andrew Rosendale, Gary Burness

8:00 am	**83-1**	*Landberg T, Depace E, Abernathy K, Luginbuhl C, Marshall G, Romano T, Tuttle A, Tripp J, Tripp S; Arcadia University, National Geographic Society, Luginbuhl Foundation, Mystic Aquarium, Tributary Mill Conservancy*	Underwater Snapping Turtle Behavior Affects Dive and Surfacing Durations
8:15 am	**83-2**	*Rosendale AJ, Dunlevy ME, McCue MD, Benoit JB; Mount St. Joseph University, University of Cincinnati, Sable Systems International*	Molecular, physiological, and behavioral shifts during prolonged starvation in the American dog tick
8:30 am	**83-3**	*Hudson DM; The Maritime Aquarium at Norwalk*	Behavioral and Metabolic Temperature Optimum Determination in an Andean Freshwater Crab.
8:45 am	**83-4**	*Short CA, Hahn DA; University of Florida*	How Do Flies Sense Their Protein Stores? Hexamerin Proteins and Reproductive Behavior in the Caribfly, *Anastrepha suspensa*
9:00 am	**83-5**	*Farallo VR, Muñoz MM; Virginia Tech*	Mountaintop endemics and climate change: is warming really a problem?
9:15 am	**83-6**	*Tapper S, Nocera JJ, Burness G*; Trent University, University of New Brunswick*	Is the energy expenditure of breeding birds limited by the risk of overheating?

9:30 am **Coffee Break** **Exhibit Hall**

10:15 AM – 12:00 PM **Session 84** **Room 1 & 2**

Complementary to S10: The World is Not Flat: Accounting for the Dynamic Nature of the Environment as We Move Beyond Static Experimental Manipulations

Chair: Kendra Greenlee

10:15 am	**84-1**	*Bock SL, Lowers RH, Rainwater TR, Hale MD, Parrott BB; University of Georgia, Kennedy Space Center, Clemson University*	Insights from the field: Using a multi-year dataset of nest thermal profiles to investigate temperature-dependent sex determination in the American alligator
10:30 am	**84-2**	*Cease AJ, Trumper EV, Overson RP; Arizona State University, National Agricultural Technology Institute*	Nutritional physiology and ecology of South American locusts *Schistocerca cancellata* during a 60-year upsurge and roughly 7-fold range expansion
10:45 am	**84-3**	*Padda SS, Glass J, Johnson D, Stahlschmidt ZR; U. Pacific*	Limited Supplies: Effects of water and food limitation on life history traits in an insect

11:00 am	**84-4**	*Hall JM, Warner DA; Auburn University*	Constantly Fluctuating in an Inconsistent Way: Comparing the Effects of Sinusoidal and Naturally Fluctuating Incubation Temperatures on Embryo Development
11:15 am	**84-5**	*Rohr JR, Civitello DJ, Cohen JM, Roznik EA, Sinervo B, Dell AI; University of South Florida, Emory University, Memphis Zoo, Univ of California, Santa Cruz, National Great Rivers Research and Education Center*	The Complex Drivers of Thermal Acclimation and Breadth in Ectotherms
11:30 am	**84-6**	*Youngblood JP, Vandenbrooks JM, Angilletta MJ; Arizona State University, Midwestern University*	Dynamics of heat tolerance during development of locusts
11:45 am	**84-7**	*Cambron LD, Yocum G, Greenlee KJ; North Dakota State University, USDA-ARS*	What's going on during diapause? Investigating the insulin pathway in overwintering *Megachile rotundata*

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

10:15 AM – 12:00 PM **Session 85** **Room 3 & 4**

Hormones & Behavior 1 - An Avian Focus

Chairs: Heather Watts, Kimberly Rosvall

10:15 am	**85-1**	*Boersma J, Enbody ED, Jones JA, Lopez-Contreras E, Karubian J, Schwabl H; Washington State University, Tulane University*	Taking a Proximate View of a Female Ornament: Do Androgens Mediate Acquisition of the Ornamented Phenotype in female White-shouldered Fairywrens?
10:30 am	**85-2**	*Jones JA, Boersma J, Enbody ED, Fuxjager MJ, Rosvall KA, Schwabl H, Webster MS, Karubian J; Tulane University, Washington State University, Wake Forest College, Indiana University, Cornell University*	Experimental inhibition of peripheral androgen receptors dampens ornament expression in a female tropical passerine
10:45 am	**85-3**	*Watts HE, Robart AR, Roby C, Rittenhouse JL, Sewall KB, Bowers JM; Washington State University, Virginia Tech*	Examining the potential role of glucocorticoid signaling in the regulation of seasonal nomadic migration
11:00 am	**85-4**	*George EM, Bentz AB, Wolf SE, Rosvall KA; Indiana University Bloomington*	Testing hormonal responses to real and simulated social challenges in a competitive female bird
11:15 am	**85-5**	*Rosvall KA, George EM, Bentz AB; Indiana University*	Seasonal changes in aggression, testosterone, and gene regulation in a cavity-nesting bird: insights on the challenge hypothesis in females
11:30 am	**85-6**	*Hope SF, Durant SE, Angelier F, Hallagan JJ, Moore IT, Kennamer RA, Hopkins WA; Virginia Tech, University of Arkansas, Centre d'Etudes Biologique de Chizé, Stockton University, University of Georgia*	Incubation Behavior is Related to Prolactin and Egg Temperature in a Wild Bird
11:45 am	**85-7**	*Hodinka BL, Ashley NT; Western Kentucky Univ, Bowling Green*	Effect of sleep loss on cognitive function and baseline plasma corticosterone levels in an arctic-breeding songbird, the Lapland longspur (*Calcarius lapponicus*)

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

10:00 AM – 12:00 PM **Session 86** **Room 5 & 6**

Developmental Plasticity

Chairs: Billie Swalla, Vivek Prakash

10:00 am	**86-1**	*Luttrell SM, Su YH, Swalla BJ*; Univ of Washington, Academia Sinica, Taiwan*	Getting a Head with Hemichordate Larval Regeneration
10:15 am	**86-2**	*MacDonald G, Snyder M, Gibson G*; Acadia University*	An Epigenetic Mechanism for Phenotypic Plasticity in the Annelid *Polydora cornuta*.
10:30 am	**86-3**	*Harms KS, Page LR; University of Victoria*	Surprise in a Small Package: Foregut Metamorphosis in an Ectoparasitic Snail (Pyramidellidae)
10:45 am	**86-4**	*Xu LC, Wang VR, Nunes C, Saito A, Koyama T, Suzuki Y; Wellesley College, Gulbenkian Institute*	Developmental mechanisms of life history trade-offs: varying JH titers lead to distinct PG activity in *Manduca* and *Drosophila*

11:00 am	**86-5**	*McGlashan JK, Thompson MB, Janzen FJ, Van Dyke JU, Spencer RJ; Western Sydney University, University of Sydney, Iowa State University, Charles Sturt University*	Synchronous hatching in freshwater turtles: metabolic and endocrine mechanisms
11:15 am	**86-6**	*Lubeck LA, Grauman B, Seitz T, Swalla BJ; Brown University, Wellesley College, University of Washington*	Clone Alone: Lithium Chloride Induced Cloning in *Dendraster excentricus*
11:30 am	**86-7**	*Prakash VN, Bull MS, Prakash M; Stanford University*	Epithelial Tissue Fracture and Healing Dynamics Govern Fast and Extreme Plastic Shape Changes in *Trichoplax adhaerens*
11:45 am	**86-8**	*Zhang LL, Seaver EC*; University of Florida*	Heads or Tails: Transcriptomic Insights into Annelid Regeneration

12:00 pm **Lunch Break**

10:00 AM – 11:45 AM **Session 88** **Room 14 & 15**

Ekoehlogical Biomechanics: A Tribute to Mimi Koehl, II

Chair: Tom Daniel

10:00 am	**88-1**	*Sebens KP; University of Washington*	Evaluating Trait-Environment Interactions Using Measures of Performance Linked to Fitness and Population Response Models
10:15 am	**88-2**	*Ozkan-Aydin Y, Culver J, Tennenbaum MJ, Goldman DI, Bhamla S; Georgia Tech*	Worm Blobs: Biophysical Principles of Survival in Worms via Aggregate Formation
10:30 am	**88-3**	*Johnson AS, Ellers O, Etzel R, Khoriaty J; Bowdoin College*	The oscillatory gait of high-speed sea stars: Do sea stars of varying morphology vary stride length or step frequency to change speed?
10:45 am	**88-4**	*Kasoju VT, Ngo T, Ford MP, Santhanakrishnan A; Oklahoma State University*	Clap and fling with densely bristled wings
11:00 am	**88-5**	*McHenry MJ, Soto A, Peterson A, Johansen JL, Laio JC; UC Irvine, NYU Abu Dhabi, Univ of Florida*	How fish predators pursue evasive prey
11:15 am	**88-6**	*Casas J; University of Tours*	Why do little hairy creatures have so many hairs? Insights from flow sensing in insects
11:30 am	**88-7**	*Daniel TL, Koehl MAR; Univ of Washington, Seattle, Univ of California, Berkeley*	Foul Play: How Epibionts Affect the Hydrodynamics of Macroalgae

11:45 am **Lunch Break**

10:15 AM – 12:00 PM **Session 89** **Room 19**

Complementary to S6: Beyond the Powerhouse: Integrating Mitonuclear Evolution, Physiology, and Theory in Comparative Biology

Chairs: Justin Havird, Geoffrey Hill

10:15 am	**89-1**	*Taylor HA, Park NR, Kavazis AN, Hood WR; Auburn University*	Variation in Mitochondrial Complex Activity, Oxidative Stress, and the Unfolded Protein Response in the Brain of Mice with Region and Parity
10:30 am	**89-2**	*Rank NE, Mardulyn PM, Heidl S, Roberts KT, Zhang B, Dahlhoff EP; Sonoma State University, University of Brussels, Santa Clara University*	Mitonuclear interactions influence performance and reproductive characters in a montane leaf beetle
10:45 am	**89-3**	*Koch Adrian RE, Damian DK; Monash University*	Dropping like flies: Testing the role of mitochondrial genetic variation in negative geotaxis response
11:00 am	**89-4**	*Barts N, Henpita C, Greenway R, Arndt S, Shaw J, Tobler M; Kansas State University, Oklahoma State University, University of Cambridge*	Genetic, biochemical, and physiological adaptation in fish inhabiting sulfide-rich environments
11:15 am	**89-5**	*Weaver RJ, Hill GE; Auburn University*	Exploring links between mitochondrial divergence, hybridization, and carotenoid metabolism in animals
11:30 am	**89-6**	*Matoo OB, Julick CR, Montooth KL; University of Nebraska- Lincoln*	Mitochondrial and Organismal Metabolic Homeostasis in the face of Genetic Variation

11:45 am	**89-7**	*Graham AM, Barreto FS; Oregon State University*	in Search of Alternative Molecular Mechanisms Underlying the Transcriptional Response to Hypoxia, in an Organism Without the Hypoxia Inducible Factor (HIF) Pathway

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

10:15 AM – 12:00 PM **Session 90** **Room 20**

Complementary to S5: Stress Phenotype: Linking Molecular, Cellular and Physiological Stress Responses to Fitness, II

Chair: Lindsey Schwartz

10:15 am	**90-1**	*Heine KB, Powers MJ, Kallenberg MC, Tucker VL, Hood WR; Auburn University*	Moderate UV-B Irradiation Increases Fecundity but Decreases Longevity in a Marine Copepod
10:30 am	**90-2**	*Hoffman AJ, Finger JW, Wada H; Auburn University*	Early Stress Priming and Maintenance of a Sexually-selected Trait and Oxidative Status
10:45 am	**90-3**	*Schwartz LC, Truebano M, Hilbish TJ; University of South Carolina, Plymouth University*	The Physiology and Transcriptomics of Thermal Tolerance in *Mytilus* Mussels
11:00 am	**90-4**	*Penney CM, Burness G, Wilson CC; Trent University*	Transgenerational effects of elevated temperature on the upper thermal tolerance of lake trout and brook trout
11:15 am	**90-5**	*Champagne CD, Khudyakov JI, McCormley MC, Deyarmin JS, Houser DS, Crocker DE; National Marine Mammal Foundation, Univ of the Pacific, Sonoma State University*	Metabolic response to acute and repeated stress in the northern elephant seal
11:30 am	**90-6**	*Garcia MJ, Sriram A, Littler A, Teets NM; Univ of Kentucky*	Genetic Variance in Cold Tolerance and its Molecular Underpinnings
11:45 am	**90-7**	*Berk SA, Breuner C; University of Montana*	Resource availabiility, CORT, and fitness in the mountain bluebird (Sialia currucoides)

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

10:00 AM – 12:00 PM **Session 91** **Room 22**

Meta-Swimming: Greater Than the Sum of Its Parts

Chair: Austin Francis Jr.

10:00 am	**91-1**	*Karakas F, Maas AE, Murphy DW; University of South Florida, Bermuda Institute of Ocean Sciences*	Sea Butterfly Swimming: The effect of shell shape on pteropod kinematics and hydrodynamics
10:15 am	**91-2**	*Oufiero CE, Rock A, Eisinger MB, Longo SJ, Wainwright D; Towson Univ, Duke Univ, Harvard Univ*	The morphology and performance of a mutant knifefish with a dorsal fin
10:30 am	**91-3**	*Matthews DG, Lauder GV; Harvard University*	Fish median fin function studied using a simple robotic model
10:45 am	**91-4**	*George AB, Olsen AM, Westneat MW; University of Chicago, Brown University*	Swimming Kinematics Reveal Multiple Gait Transition Strategies Within Balistoid Fishes
11:00 am	**91-5**	*Soto A, McHenry MJ; Univ of California, Irvine*	The hydrodynamics and control of prey pursuit in zebrafish
11:15 am	**91-6**	*Di Santo V, Lauder GV; Harvard University*	Fish Schooling: Dynamic Shifts in School Structure with Swimming Speed and During Feeding
11:30 am	**91-7**	*Ruddy BT, Porter ME; Florida Atlantic University*	Volitional swimming kinematics of schooling blacktip sharks (Carcharhinus limbatus) in the wild
11:45 am	**91-8**	*Francis Jr AW; Georgia Southern University*	Cephalofoil Hydrodynamics of the Winghead Shark, *Eusphyra blochii*

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

10:00 AM – 12:00 PM **Session 92** **Room 23**

Flies in the Honey

Chair: Bo Cheng

10:00 am	**92-1**	*Liu Y, Roll J, Van Kooten S, Deng X; Purdue University*	Schlieren photography to study the flow around flying insects

10:15 am	**92-2**	*Meresman Y, Husak JF, Ben-Shlomo R, Ribak G; Tel Aviv University, Univ of St. Thomas, Univ of Haifa*	The Effect of Variation in Hindwing Morphology on Elastic Wing Deformation During Free-Flight in Scarab-Beetles
10:30 am	**92-3**	*Doman TJJ, Bhandawat V; Duke University*	A New Behavioral Paradigm to Explore Idiothetic Cues in Navigation by Drosophila
10:45 am	**92-4**	*Balebail S, Raja SK, Sane SP; National Centre for Biological Sciences, TIFR*	Landing behavior on vertical vs. inverted substrates by flies
11:00 am	**92-5**	*Ache JM, Namiki S, Lee A, Branson K, Card GM*; HHMI Janelia Research Campus*	Descending Control of Landing in *Drosophila*
11:15 am	**92-6**	*Namiki S, Ros I, Rowell W, De Souza A, Dickinson MH, Korff WL*, Card GM; Howard Hughes Medical Institute, California Institute of Technology*	Descending control of flight behavior in flies
11:30 am	**92-7**	*Hsu SJ, Seber E, McFarland C, Cheng B; Pennsylvania State University*	Visual Speed Control in Pitch-Constrained Blue Bottle Flies in a Motorized Magnetically-Levitated Flight Mill
11:45 am	**92-8**	*Behbahani AH, Melis JM, Dickson WB, Dickinson MH; Caltech*	Fruit flies must overcome inertial torques to modulate wing pitch
12:00 pm		**Lunch Break**	

10:00 AM – 11:45 AM **Session 93** **Room 24**

Gonna Get a Leg Up

Chairs: Shi-Tong Hsieh, Vikas Bhandawat

10:00 am	**93-1**	*Chun C, Biswas T, Bhandawat V; Duke Univ, Loyola Univ of New Orleans*	General Template Model for Insect Locomotion
10:15 am	**93-2**	*Tirumalai AS, McMahan SB, Hall SB, Biswas T, Bhandawat V; Duke University, Loyola University of New Orleans*	Neuromechanical Model of Fly Leg
10:30 am	**93-3**	*Revzen S; Univ of Michigan, Ann Arbor*	Moving with more legs is different: a geometric mechanics perspective
10:45 am	**93-4**	*Neveln ID, Dallmann CJ, Sponberg S; Georgia Institute of Technology, Bielefeld University*	When Time is Scarce, Timing is Almost Everything: a Comparative Analysis of Fast vs. Slow Insect Locomotor Control
11:00 am	**93-5**	*Tucker EL, Xi S*, Quinn BL, Hsieh ST; Temple University, Harriton High School*	Quantifying dynamic stability in six, seven, and eight-legged running spiders
11:15 am	**93-6**	*Bhandawat V; Duke University, Visa*	Principles underlying control of multi-jointed limb
11:30 am	**93-7**	*Taylor JRA; University of California, San Diego*	Biomechanics of crab skeletons on land
11:45 am		**Lunch Break**	

10:00 AM – 11:15 AM **Session 94** **Room 25**

Adaptation

Chairs: Shabnam Mohammadi, Fredric Janzen

10:00 am	**94-1**	*Martin RP, Dias A, Summers AP, Gerringer MG; University of Kansas, Whitman College, University of Washington*	Variations in Bone Density within Deep-Sea Grenadiers (Macrouridae)
10:15 am	**94-2**	*Mohammadi S, Yang L, Herrera-Álvarez S, Rodríguez P, Dobler S, Storz JF, Crawford AJ, Andolfatto P; University of Nebraska, Princeton University, Universidad de los Andes, Universität Hamburg, Columbia University*	Functional mechanisms of adaptive resistance to dietary toxins in a lineage of Neotropical frogs
10:30 am	**94-3**	*Vander Linden AR, Dumont ER; Univ of Massachusetts Amherst, Univ of California, Merced*	Combat Behavior Predicts Morphology of Cervical Vertebrae in Male Ruminant Mammals
10:45 am	**94-4**	*Janzen FJ, Delaney DM, Mitchell TS, Warner DA; Iowa State University, University of Minnesota, Auburn University*	Do Covariances between Maternal Oviposition Behavior and Embryonic Physiology Drive Sex-Ratio Evolution under Environmental Sex Determination?

11:00 am	**94-5**	*Nikolakis ZL, Schield DR, Orton RW, Row KR, Smith CF, Meik JM, Watson J, Mackessy SP, Castoe TA; University of Texas at Arlington, University of Northern Colorado, University of North Texas*	Genomic perspective of body size evolution in a rattlesnake complex

11:15 am ..... **Lunch Break** .....

10:00 AM – 12:00 PM **Session 95** **Room 12**

Reproductive and Ontogenetic Physiology

Chairs: Laura Enzor, Jonathan Cowart

10:00 am	**95-1**	*Lenard A, Gifford ME; University of Central Arkansas*	Effects of early-season maternal lipid consumption on reproductive strategy and embryonic development in the prairie lizard, *Sceloporus consobrinus*
10:15 am	**95-2**	*Finch G, Perretta C, Davies B, Rosendale AJ, Holmes CJ, Jennings EC, Gantz JD, Spacht D, Lee Jr. RE, Denlinger DL, Weirauch MT, Benoit JB*; University of Cincinnati, Miami University, Ohio State University, Cincinnati Children's Hospital Medical Center*	RNA-Seq and Proteomics Analyses of Mechanisms Underlying Reproduction in the Antarctic Extremophile, *Belgica antarctica*
10:30 am	**95-3**	*Azzolini JL, Denardo DF; Arizona State University*	Effect of Reproduction on Female Oxidative State and the Potential for Vertical Transfer to Offspring
10:45 am	**95-4**	*Curry JE, Navara KJ; University of Georgia*	Effects of safflower and flax seed oil on primary sex ratio in Japanese quail, *Coturnix japonica*
11:00 am	**95-5**	*Rucker HR, Parker MR; James Madison Univ*	Decrypting Female Attractivity in Garter Snakes
11:15 am	**95-6**	*Enzor LA, Moso E, Hamilton M, Hankins C, Raimondo S, Barron MG; U.S. Environmental Protection Agency*	Elevated pCO_2 and Hypoxia Alter the Acid-Base Balance of Developing Sheepshead Minnow, *Cyprinodon variegatus*
11:30 am	**95-7**	*Powers SD, Grayson KL, Martinez E, Agosta SJ; Virginia Commonwealth University, University of Richmond, Eastern Illinois University*	Ontogenetic Variation in Metabolic Rate-Temperature Relationships in Larvae of an Invasive Ectotherm
11:45 am	**95-8**	*Cowart JR, Arnold DM, Stanton DL, Van Der Horst G, Larkin ILV; University of Florida, University of the Western Cape*	A Comparative Structural Analysis of Spermatozoa From Three Evolutionarily-Related Species: the Manatee, Elephant, and Hyrax

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

Sunday Program Afternoon Sessions

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

1:30 PM – 2:45 PM **Session 96** **Room 1 & 2**

Pathology and Disease

Chair: Ana Longo

1:30 pm	**96-1**	*Gilbert RG, Paul AM, Bhattacharya S; NASA Ames Research Center*	Effects of Spaceflight and Simulated Microgravity on a Host-Pathogen System
1:45 pm	**96-2**	*Frank CL, Davis AD, Herzog C; Fordham University, NY Dept. of Health, NY Dept. of Environmental Conservation*	The evolution of a resistance to White-nose Syndrome by a North American bat population
2:00 pm	**96-3**	*Richards-Zawacki CL, Robak M, Rollins-Smith L; University of Pittsburgh, Tulane University, Vanderbilt University*	Effects of temperature on the efficacy of amphibian skin defenses
2:15 pm	**96-4**	*Longo AV, Fleischer RC, Lips KR; University of Florida, Smithsonian Insitution, University of Maryland*	Co-infections enhance invasive success of the salamander-killing fungus in widely distributed newts
2:30 pm	**96-5**	*Nguyen KH, Rohr JR, Gemmell BJ; University of South Florida*	Examining the effects of temperature and viscosity on miracidial and cercarial movement of *Schistosoma mansoni*

2:45 pm ..... **Coffee Break** ..... **Exhibit Hall**

1:30 PM – 3:30 PM **Session 97** **Room 3 & 4**

Hormones & Behavior II - Everything but the Birds

Chairs: Kathleen Munley, Carly Madelaire

1:30 pm	**97-1**	*Wolford DM, Davis JE; Radford University*	Investigating the Effects of Juvenile Hormone and Royal Jelly on *Lasiodora parahybana*
1:45 pm	**97-2**	*Madelaire CB, Zena LA, Buck CL, Bicego KC, Gomes FR; Univ of São Paulo, Northern Arizona Univ*	Seasonal relationship between steroids and immunity in a hibernating tegu lizard
2:00 pm	**97-3**	*Munley KM, Deyoe JE, Ren CC, Demas GE; Indiana University*	Melatonin mediates seasonal transitions in circulating androgen profiles and aggression in male Siberian hamsters
2:15 pm	**97-4**	*Finton CJ, Ophir AG; Cornell University*	Is spatial memory impacted by intranasal administration of oxytocin or vasopressin? Chronic intranasal vasopressin influences spatial memory in male prairie voles
2:30 pm	**97-5**	*Agan JA, Lovern MB, Grindstaff JL, Fox SF; Oklahoma State University*	How Collared Lizard, *Crotaphytus collaris*, Hatchling Orange Bars Affect Male-Male Interactions
2:45 pm	**97-6**	*Wilson RC, Lemaster MP, Lutterschmidt DI; Portland State University, Western Oregon University*	Leptin promotes reproductive behavior in red-sided garter snakes (*Thamnophis sirtalis parietalis*)
3:00 pm	**97-7**	*Overli O; Norwegian University of Life Sciences*	Pigments, parasites, and personalities: The role of cortisol and melanocortin receptor gene variants
3:15 pm	**97-8**	*Edwards PD, Boonstra R; University of Toronto Scarborough*	The Neuroendocrinology of Population Cycles in Voles

3:30 pm **Coffee Break** **Exhibit Hall**

1:30 PM – 3:30 PM **Session 98** **Room 5 & 6**

Energetics of Endotherms: Seasonal and Evolutionary Patterns

Chair: Scott McWilliams

1:30 pm	**98-1**	*Haase CG, Fuller NW, Hayman DTS, Hranac CR, Olson SH, Plowright RK, McGuire LP; Montana State University, Texas Tech University, Massey University, Wildlife Conservation Society*	Bats Are Not Squirrels: Revisiting the Cost of Cooling in Hibernating Mammals
1:45 pm	**98-2**	*Cornelius Ruhs E, Piersma T, Chastel O, VÉZina F; Université du Quèbec à Rimouski, University of Groningen, Centre National de la Recherche Scientifique*	Triidothyronine is associated with heat production but not energy intake in a long-distance migratory shorebird
2:00 pm	**98-3**	*Thometz NM, Rosen D, Reichmuth C; Univ of San Francisco, Univ of British Columbia, Univ of California, Santa Cruz*	Seasonal Energetics of Ice-Dependent Arctic Seals Reveal the Metabolic Consequences of Different Molting Strategies
2:15 pm	**98-4**	*Wilbur SM, Kitaysky AS, Barnes BM, Williams CT; Univ of Alaska Fairbanks*	Tissue-Specific Telomere Dynamics in Hibernating Arctic Ground Squirrels (*Urocitellus parryii*)
2:30 pm	**98-5**	*Poff M, Owerkowicz T; California State University*	Ablation of rostral conchae does not affect heat exchange in the upper respiratory tract of the domestic chicken
2:45 pm	**98-6**	*Carter WA, Demoranville KJ, Pierce BJ, McWilliams SR; University of Rhode Island, Sacred Heart University*	Seasonal progression and diet fatty acid composition influence metabolic rates, sustained exercise performance, and oxidative enzyme activity in European Starlings
3:00 pm	**98-7**	*McWilliams S, Pierce B, Witenzellner A, Langlois L, Speakman J, Demoranville K, Goymann W, Trost L, Bryla A, Dzialo M, Sadowska E, Bauchinger U; University of Rhode Island, Sacred Heart University, Max Planck Institute for Ornithology, Chinese Academy of Sciences, Jagellonian University*	The energy savings-oxidative cost tradeoff for birds during migration
3:15 pm	**98-8**	*Brzek P, Selewestruk P, Nedergaard J, Konarzewski M; Univ of Bialystok, Stockholm Univ*	Divergent selection for basal metabolic rate in laboratory mice affected the amount of UCP1 protein

3:30 pm **Coffee Break** **Exhibit Hall**

1:30 PM – 3:15 PM **Session 99** **Room 13**

Muscle Physiology, II

Chairs: Bernardo Mesa Cruz, Andrea Rummel

1:30 pm	**99-1**	*Draud SL, Dearolf JL; Hendrix College*	Fiber-type profile of Atlantic spotted dolphin (*Stenella frontalis*) diaphragm
1:45 pm	**99-2**	*Tune T, Irving T, Sponberg S; Georgia Tech, Illinois Tech*	X-Ray Diffraction Resolves how Lattice Spacing Explains the Workloop Differences of Two Muscles with Identical Steady State Properties
2:00 pm	**99-3**	*Herndon CJ, Fenton FH; Georgia Institute of Technology*	Tell-Tale Hearts and the Descent into Cardiac Chaos
2:15 pm	**99-4**	*Rummel AD, Swartz SM, Marsh RL; Brown University*	Regional thermal specialization in bat wing muscles: a proximal–distal temperature and thermal sensitivity gradient
2:30 pm	**99-5**	*Malingen SA, Cass JA, Powers JD, Ma W, Irving T, Daniel TL; University of Washington, Illinois Institute of Technology*	*in-vivo* x-ray diffraction imaging of a synchronous flight muscle reveals thick filament stretching as a function of activation
2:45 pm	**99-6**	*Mesa Cruz B, Rhoads R, Zhao L, Kroscher K, Brown J, Kelly M; Elizabethtown College, Virginia Tech, Smithsonian Institution*	Skeletal Satellite Cell Myogenic Activity in Hibernating American Black Bears
3:00 pm	**99-7**	*Tengler M, Bryan A, Reichmuth C, Thometz NM; University of San Francisco, Alaska Department of Fish and Game, University of California, Santa Cruz*	Physiological Development of Locomotor Muscles Influence Diving Capacities in Free-Ranging Bearded Seals

3:15 pm **Coffee Break** **Exhibit Hall**

1:30 PM – 3:15 PM **Session 100** **Room 14 & 15**

Ekoehlogical Biomechanics: A Tribute to Mimi Koehl, III

Chair: Kate Loudon

1:30 pm	**100-1**	*Elul T, Ha J, Lakhani F, Burke M, Radhika R, Revels J; Touro University California*	beta-catenin and Myosin II differentially regulate optic axon pathfinding and growth cone morphology in the optic tract
1:45 pm	**100-2**	*Okamura B; Natural History Museum, London*	A passion for colonies
2:00 pm	**100-3**	*Main RP; Purdue University*	Solid and fluid mechanics in the skeleton: Dr. Mimi Koehl's undergraduate biomechanics course and my research career in skeletal mechanobiology.
2:15 pm	**100-4**	*Ramaswamy SS, Sane SP*; National Centre for Biological Sciences, TIFR*	The role of water and pheromones in mound-building behavior in termites
2:30 pm	**100-5**	*Dorgan KM, Lockridge G, Ballentine W, Kiskaddon E, Clemo WC; Dauphin Island Sea Lab*	Mechanical properties of muds: a worm's perspective
2:45 pm	**100-6**	*Loudon C, Tran K, Kok C; Univ of California, Irvine*	When Does A Bug Know That It Has Stepped On A Sticky Surface?
3:00 pm	**100-7**	*Koehl MAR; Univ, of California, Berkeley*	How Ambient Flow Affects the Locomotion of Small Organisms

3:15 pm **Coffee Break** **Exhibit Hall**

1:30 PM – 3:15 PM **Session 101** **Room 19**

Complementary to S6: Beyond the Powerhouse: Integrating Mitonuclear Evolution, Physiology, and Theory in Comparative Biology

Chair: Daniel Hahn

1:30 pm	**101-1**	*Ramsey AJ, McCauley DE, Mandel JR; University of Memphis, Vanderbilt University*	Patterns of cytonuclear linkage disequilibrium differ between heteroplasmic and homoplasmic individuals of wild carrot, *Daucus carota* (Apiaceae), a gynodioecious plant species
1:45 pm	**101-2**	*Milani L, Ghiselli F; University of Bologna, Italy*	Natural heteroplasmy, mitochondrial inheritance and activity in bivalve molluscs

2:00 pm	**101-3**	*Teets NM, Dias V, Schetelig MF, Handler AM, Hahn DA*; University of Kentucky, International Atomic Energy Agency, Justus-Leibeg University, United States Department of Agriculture, Univesity of Florida*	Making macho males by transgenic overexpression of a mitochondrial antioxidant enzyme
2:15 pm	**101-4**	*Bedwell H, Dixon G, Bay L, Matz M; The University of Texas at Austin, Australian Institute of Marine Science*	Mitochondrial variation as a source of adaptive genetic variation to heat stress in corals
2:30 pm	**101-6**	*Mossman JA, Rand DM; Brown University*	Mitochondria, sex and nuclear gene expression: Cursing the Mother's Curse
2:45 pm	**101-7**	*Rand DM, Mossman JA; Brown University*	Mitonuclear epistasis, genotype-by-environment interactions and personalized genomics of complex traits in Drosophila
3:00 pm	**101-8**	*Niitepõld K, Parry HA, Kavazis AN, Hood WR; Auburn University*	Starvation reduces mitochondrial function in the monarch butterfly
3:15 pm	**Coffee Break**		**Exhibit Hall**

1:30 PM – 3:15 PM **Session 102** **Room 20**

Complementary to S5: Stress Phenotype: Linking Molecular, Cellular and Physiological Responses to Fitness, III

Chair: Ben Dantzer

1:30 pm	**102-1**	*Benowitz-Fredericks ZM, Caine PB, Malisch JL, Edwards KM, Farmer JL, Haussmann MF, Hatch SA; Bucknell Univ, St. Mary's of Maryland, Inst. Seabird Research & Cons.*	Acute Administration of Exogenous Corticosterone in Seabird Chicks Rapidly Mobilizes Lipids but not Glucose
1:45 pm	**102-2**	*Tanner RL, Gleason LU, Dowd WW; Washington State Univ, California State Univ Sacramento*	Transcriptomic and proteomic analyses of inter-individual variation among intertidal mussels
2:00 pm	**102-3**	*Wolf SE, Beltran SE, Sanders TL, Rosvall KA; Indiana University, Dominican University, Oklahoma State University*	When mom takes a sick day: sex-specific telomere dynamics in response to early postnatal stress
2:15 pm	**102-4**	*Guindre-Parker S, McAdam A, Boutin S, Humphries M, Lane J, Coltman D, Dantzer B; University of Guelph, University of Alberta, McGill University, University of Saskatchewan, University of Michigan*	Do glucocorticoid hormones respond to selection in free-living North American red squirrels?
2:30 pm	**102-5**	*Teets NM, Kawarasaki Y, Potts LJ, Gantz JD, Philip DP, Denlinger DL, Lee RE; Univ of Kentucky, Gustavus Adolphus College, Hendrix College, Miami Univ, Ohio State Univ*	Rapid Cold Hardening Provides Sublethal Benefits in an Antarctic Extremophilic Insect
2:45 pm	**102-6**	*Zimmer C, Rosvall KA, Ardia DR, Taylor AR, Bentz AB, Taff CC, Vitousek MN; Cornell University, Indiana University, Franklin and Marshall College, University of Alaska*	Differential MR and GR Expression in the Tree Swallow Brain is Associated with Individual Variation in Stress Physiology
3:00 pm	**102-7**	*Small TW, Bridge ES, Bebus SE, Schoech SJ; University of Memphis, University of Oklahoma*	Free-living, lower stress-responsive Florida scrub-jays (*Aphelocoma coerulescens*) perform better on an associative learning test
3:15 pm	**Coffee Break**		**Exhibit Hall**

1:30 PM – 3:30 PM **Session 103** **Room 22**

Whole Body Swimming Mechanics

Chairs: Chris Kenaley, Eric Tytell

1:30 pm	**103-1**	*Tack NB, Du Clos KT, Gemmell BJ; University of South Florida*	Exploring the Benefits and Limitations of Eel-like Swimming
1:45 pm	**103-2**	*Donatelli CM, Shen TH, Khanna S, Tytell ED; Tufts University, Columbia University*	The hydrodynamics of tail twisting during swimming in the American Eel (*Anguilla rostrata*)
2:00 pm	**103-3**	*Howe SP, Leffler D, Astley HC; Univ of Akron*	Midlines in motion: Connecting Midline Curvature Dynamics to Heading Change and Center of Mass Deflection in Fishes

2:15 pm	**103-4**	*Lucas KN, Lauder GV, Tytell ED; Harvard University, Tufts University*	Low and High Pressure Both Contribute to Force Production in Body-Caudal Fin Locomotion in Fishes
2:30 pm	**103-5**	*Ming TY, Song JL, Jin BW, Luo HX, Du RX, Ding Y*; Beijing Computational Science Research Center, Vanderbilt University, Chinese University of Hong Kong*	How Fish Power Swimming -- a 3D Computational Fluid Dynamics Study
2:45 pm	**103-6**	*Kenaley CP, Petrosian G, Santos-Powell N, Rooney C; Boston College*	No One Lambda: Propulsive Wavelength Varies with Swimming Speed and Axial Position in Rainbow Trout.
3:00 pm	**103-7**	*Jusufi A, Vogt D, Wood RJ; Max Planck Institute, Harvard University*	Co-Contraction facilitates Body Stiffness Modulation during Swimming with Sensory Feedback in a Soft Biorobotic Physical Model
3:15 pm	**103-8**	*Tytell ED; Tufts University*	How body shape and mechanics interact for swimming performance in (physical models of) fishes: Volumetric flow visualization, forces, and power
3:30 pm		**Coffee Break**	**Exhibit Hall**

1:45 PM – 3:30 PM **Session 104** **Room 23**

Stability & Maneuvering in a Low Re World

Chairs: Arvind Santhanakrishnan, Brett Aiello

1:45 pm	**104-2**	*Ford MP, Kasoju VT, Gaddam MG, Santhanakrishnan A; Oklahoma State University*	Clap and fling of bristled wings with varying solid surface areas
2:00 pm	**104-3**	*Aiello BR, Hamilton CA, Kawahara AY, Sponberg S; Georgia Institute of Technology, Florida Museum of Natural History*	Big wings and agile flight: evolutionary patterns of moth morphology and stability in Bombycoidea
2:15 pm	**104-4**	*Combes SA, Badger MA, Gagliardi SF, Wargin AH, Flores MS; Univ of California, Davis*	Inferring real-world flight conditions from high-throughput preference tests: bumblebees display partiality for particular features of wind and clutter
2:30 pm	**104-5**	*Parsons ZM, Herndon JD, Strange JP, Lozier JD, Dillon ME; University of Wyoming, Utah State University, University of Alabama*	Altitudinal variation in flight morphology and kinematics of common-garden reared bumblebees (*Bombus vosnesenskii*)
2:45 pm	**104-6**	*Gagliardi SF, Combes SA; University of California-Davis*	Effects of Symmetric vs. Asymmetric Wing Damage on the Stability and Maneuverability of Bumblebees
3:00 pm	**104-7**	*Bustamante J, Daniel TL; University of Washington*	How size and shape effect abdominal contribution of insect flight control
3:15 pm	**104-8**	*Gau JF, Gravish N, Sponberg S; Georgia Institute of Technology, Univ of California, San Diego*	Effects of Shape, Material, and Musculature on Energy Exchange Capacity in the Hawkmoth Thorax
3:30 pm		**Coffee Break**	**Exhibit Hall**

1:30 PM – 3:15 PM **Session 105** **Room 24**

Give and Go: Pushing Off and Moving Forward

Chairs: Kit Knight, David Lee

1:30 pm	**105-1**	*Basu CK, Richards CT; Royal Veterinary College*	Modelling the effect of long axis rotation on hindlimb moment arms in the red-legged running frog *Kassina maculata*
1:45 pm	**105-2**	*Duman AJ, Azizi E; Univ of California, Irvine*	Substrate Stiffness Affects the Coordinated Landing of *Rhinella marina*
2:00 pm	**105-3**	*Knight KC, Lee DV; Univ of Nevada, Las Vegas*	Comparative biomechanics of horizontal, fine-branch locomotion in lizards: Part 1.
2:15 pm	**105-4**	*Antoniak GJ, Biswas T, Cortes N, Sikdar S, Bhandawat V; Duke University, Loyola University, George Mason University*	Generalized Model of Locomotion
2:30 pm	**105-5**	*Hubicki CM, Daley MA; Florida State University, Royal Veterinary College*	An optimal control model of bipedal leg swing for predicting gait duty factor in cursorial birds

2:45 pm	**105-6**	*Lee DV, Isaacs MR; University of Nevada, Las Vegas*	Does the Cost of Bipedal Walking Increase as the Square of Speed?
3:00 pm	**105-7**	*Usherwood JR; The Royal Veterinary College*	The indiscrete walk-run transition and skewed forces of young children match peak power minimization, as is suitable for short bipeds

3:15 pm ..... **Coffee Break** ..... **Exhibit Hall**

1:30 PM – 3:30 PM **Session 106** **Room 25**

Life History Evolution

Chairs: Robert Srygley, Michael Tobler

1:30 pm	**106-1**	*Hunter FK, Kapheim KM; Utah State University*	The molecular and physiological underpinnings of life history tradeoffs in a socially flexible bee
1:45 pm	**106-2**	*Hedrick AR, Greene DU, Lewis EL, Hood AS, Iverson JB; Iowa State University, Texas Tech University, Utah State University, Earlham College*	Climate Effects on Nesting Phenology in Nebraska Turtles
2:00 pm	**106-3**	*Srygley RB; USDA-Agricultural Research Service*	Parental Photoperiod Prolongs Egg Diapause in a Montane Population of Mormon crickets
2:15 pm	**106-4**	*Vaught RC, Bonduriansky R, Dowling DK; Monash University, UNSW Australia*	Mitochondrial and X chromosome (Mito-X) Genomic Interactions and Implications for the Evolution of Sex Differences
2:30 pm	**106-5**	*Reinke B, Cayuela H, Hoekstra L, Janzen F, Bronikowski A, Miller D; Pennsylvania State University, Université Laval, Iowa State University*	Comparing ectotherm senescence using a hierarchical model
2:45 pm	**106-6**	*Tobler M, Culumber ZW; Kansas State University, University of Alabama in Huntsville*	Parent-Offspring Conflict, Ecology, and Life History Diversification in Livebearing Fishes
3:00 pm	**106-7**	*Davis HR, Bauer AM, Jackman TR; Villanova University*	When Being Generic Makes You Diverse: Phylogenetic and Morphological Diversity of the Gecko Genus *Cyrtodactylus*
3:15 pm	**106-8**	*Bump P, Lowe CJ; Hopkins Marine Station of Stanford University*	Insights into building complex life cycles: an investigation of development in adult and larval body plans of the indirect developing hemichordate *Schizocardium californicum*

3:30 pm ..... **Coffee Break** ..... **Exhibit Hall**

1:30 PM – 3:15 PM **Session 107** **Room 12**

Education and the Undergraduate

Chairs: Kelly Kissane, Kirt Onthank

1:30 pm	**107-1**	*Spain D, Chavez B, Mendoza V; Dominican University of California*	An Ocean Acidification Case Study: Non-Science Majors vs Science Majors
1:45 pm	**107-2**	*Jindrich DL; California State University, San Marcos*	'Thinking for Writing' and 'A Framework for Scientific Papers:' Using Writing to Support Reasoning, and Reasoning to Improve Writing
2:00 pm	**107-3**	*Slee JS, McLaughlin JS; DeSales University, Penn State University*	Making it Stick: A CURE Designed to Introduce Students to the Scientific Process and the Host Response to Foreign Materials
2:15 pm	**107-4**	*Baker DM; University of Mary Washington*	Redesign of an undergraduate endocrinology course to incorporate authentic research
2:30 pm	**107-5**	*Yen J, Li W; Georgia Institute of Technology*	Teaching Biologically Inspired Design
2:45 pm	**107-6**	*Taft NK; University of Wisconsin -Parkside*	Tiny Earth: A new model for laboratory-based undergraduate courses
3:00 pm	**107-7**	*Rivera AS; Univ of the Pacific*	An Open Education Resource (OER) textbook and curriculum for EvoDevo

3:15 pm ..... **Coffee Break** ..... **Exhibit Hall**

SUNDAY POSTER SESSION P3

Central Exhibit Hall, 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

Ekoehlogical Biomechanics: A tribute to Mimi Koehl

P3-1	*Schleifer HJ, Ellers O, Johnson AS; Bowdoin College*	Using circuit theory to model flow and pressure outputs of the circulatory system of the American lobster, *Homarus americanus*
P3-2	*Maguire MC, Hambelton G, Ellers O, Dickinson P, Johnson AS; Bowdoin College*	Contributions of artery and sarcomere length changes to the heart's ability to generate tension in the American lobster, *Homarus americanus*
P3-3	*Etzel R, Khoriaty J, Ellers O, Johnson AS; Bowdoin College*	The contribution of morphological characteristics on the bouncing gait of sea stars: A cross-species comparison
P3-4	*Kukaj A, Escalante G, Ellers O, Dickinson P, Johnson AS; Bowdoin College*	Force-velocity relationships in cardiac muscles of the American lobster, *Homarus americanus*
P3-5	*Romanovich LA, Voltzow J; Univ of Scranton*	Anemones in Hot Acid: The Effects of Elevated Temperature and Enhanced Carbon Dioxide on Anemones and their Symbionts
P3-6	*Ballentine WM, Dorgan KM; University of South Alabama*	Effects of Infauna on Sound Speed and Attenuation in Marine Sediments

Complementary to S12: The Path Less Traveled: Reciprocal Illumination of Gecko Adhesion by Unifying Material Science, Biomechanics, Ecology, and Evolution

P3-7	*Hagey TJ, Phillips J, Gering E; Mississippi University for Women, University of Idaho, Michigan State University*	Microhabitat Texture of Invasive Hawai'ian Arborael Lizards
P3-8	*Song Y, Full RJ, Dai Z; Nanjing Univ of Aeronautics and Astronautics, Univ of California, Berkeley*	Geckos Actively Align Toes against Gravity during Sideways Wall Running
P3-9	*Garner AM, Pamfilie AM*, Dhinojwala A, Niewiarowski PH; The University of Akron*	Relationships between Adhesive Performance and Substrate Preference Behavior in Tokay Geckos (*Gekko gecko*)
P3-10	*Garner AM, Wilson MC, Russell AP, Niewiarowski PH, Dhinojwala A; University of Akron, University of Calgary*	Morphometrics and Patterning of the Adhesive Setal Fields of an *Anolis* Lizard in Comparison to those of its Gekkotan Counterparts
P3-11	*Mitchell CT, Drotlef D, Dayan CB, Sitti M, Stark AY; Villanova University, Max Planck Institute for Intelligent Systems*	Elastic modulus affects adhesive strength of gecko-inspired synthetics in variable temperature and humidity

Complementary to S11: Allometry, Scaling and Ontogeny of Form

P3-12	*Lavine MD, Hayes AM*, Zinna RS, Gotoh H, Emlen DJ, Lavine LC; Washington State University, Mars Hill University, Hokkaido University, University of Montana*	Uncoupling horn growth from body size in the Asian rhinoceros beetle
P3-13	*Dingwall HL, Grinstein M, Capellini TD, Galloway JL; Harvard University, Massachusetts General Hospital*	Transcriptomics of postnatal tendon growth
P3-14	*Vyas P, Prakash M; Stanford University*	Dynamics of Placozoa cellular reaggregation: Self-organization of tissue architectures via assembly/disassembly of *Trichoplax adhaerens*

Kinematics

P3-15	*Tseng ZJ, Grabowski C*; University at Buffalo*	A Cost-Effective System for Capturing Chewing Movements Using Small Fluorescent Paper Markers
P3-16	*Farley GM, Bedore CN, Patek SN; Duke University, Georgia Southern University*	Rapid hydrostatic tentacle protrusion in cuttlefish
P3-17	*Stewart TA, Aiello BR, Gau GF, Bhamla S, Shubin NH; University of Chicago, Georgia Institute of Technology*	The convergent evolution of blinking in mudskippers and tetrapods

P3-18	*Tewksbury CD, Wilkinson K, Gerstner CFE, Gerstner GE; University of Michigan, A2 Hosting*	Masticatory Jaw Movements in Pigs, Where and When Does Variation Occur? Insights with Functional Data Analysis
P3-19	*Hoffmann SL, Porter ME*; Florida Atlantic University*	Three-dimensional fin kinematics of submerged walking in the epaulette shark
P3-20	*Valencia MM, Kawano SM; Long Beach State Univ*	Comparative kinematics of the forelimb during terrestrial locomotion in semi-aquatic versus terrestrial salamanders
P3-21	*Palecek AM, Blob RW; Clemson University*	Comparative Kinematics of Flamingos During Terrestrial Walking Versus Wading
P3-22	*Ortega R, McCarty-Glenn M, Mehta RS, Ward AB; Adelphi University, Univ of California, Santa Cruz*	Role of substrate during terrestrial locomotion in Asian Swamp Eels (*Monopterus albus*)
P3-23	*McCarty-Glenn M, Syed S, Mehta RS, Ward AB; Adelphi University, Univ of California, Santa Cruz*	How substrate impacts terrestrial locomotion in American eels
P3-24	*Usherwood JR, Granatosky MC; The Royal Veterinary College, The University of Chicago*	Work minimization and foot contact timings in slow upright and inverted quadrupedal gaits
P3-25	*Hall J, Abeyesinghe S, Daley MA*; Royal Veterinary College*	Interactions between personality expression and locomotor dynamics in helmeted guinea fowl (*Numida meleagris*)
P3-26	*Fleissner ER, Mensinger ME; University of Minnesota Duluth, Truman State University*	Kinematics of the Flying Carp
P3-27	*Movsesyan T, Stover KK, Olberding JP, Azizi E; Univ of California, Irvine*	Digging into the burrowing kinematics of Hurter's spadefoot toad
P3-28	*Turnbull KF, McNeil JN, Sinclair BJ; University of Western Ontario*	Does the Energetic Cost of Burrowing through Different Soils Determine Insect Overwintering Site Selection?
P3-29	*Sandes De Souza AP, Smith NS, Wilson RS; University of Brasilia, University of Sydney, University of Queensland*	Testing a model of escape performance in terrestrial animals
P3-30	*Berles P, Heymann EW, Nyakatura JA; Humboldt Universität zu Berlin, Deutsches Primatenzentrum, Göttingen*	Differential habitat utilization in two sympatric tamarins (Callitrichidae, Primates) in Amazonian Peru: Leaping behavior and Importance for morphological Studies

Swimming

P3-31	*Travis KG, Hoffmann SL, Gibb AC; California State Univ., Florida Atlantic Univ, Northern Arizona Univ*	Give Me a Brake: Comparative Pectoral Fin Kinematics and Mechanics Across Sculpin Species
P3-32	*Cohen HE, Kane EA; Georgia Southern University*	Damaged Goods: Do Injuries Affect Swimming Performance During Prey Capture in Bluegill?
P3-33	*Allred LA, Kane EA, Oufiero CE; Georgia Southern Uni., Towson Uni.*	Comparison of Swimming Energetics Between Damaged and Healthy Bluegill Sunfish (*Lepomis macrochirus*)
P3-34	*Downs AM, Kolpas A, Block BA, Fish FE; West Chester Univ, Stanford Univ*	Turning Performance by Bluefin Tuna: Novel Mechanism for Rapid Maneuvers with a Rigid Body
P3-35	*Tumminelli AN, Bartol IK; Old Dominion University*	Fin Motion Diversity in Squid During Turning
P3-36	*Zalaskus KA, Bartol SM*, Bartol IK; Old Dominion University, Virginia Wesleyan University*	Swimming Kinematics of Loggerhead Sea Turtles during Early Ontogeny
P3-37	*Ganley AM, Jastrebsky RA, Bartol IK; Old Dominion University, Holderness School*	Maneuvering Performance of Squid: Coupling Kinematics with 3D Velocimetry
P3-38	*Eisinger M, Oufiero C; Towson University*	Does the Reappearance of a Dorsal Fin in the Black Ghost Knife Fish *Apteronotus albifrons* Affect Swimming Kinematics?
P3-39	*Kelsay TS, Sein IH, Deban SM; University of South Florida*	Thermal Sensitivity of Burst Swimming in Salamanders

Flight

P3-40	*Wilcox SC, Clark CJ; Univ of California, Riverside*	Individual Variation in Flight Performance during a Hummingbird Courtship Display
P3-41	*Vega K, Clark CJ; California State University, San Bernardino, University of California, Riverside*	Limits to Top Speed in Hummingbirds
P3-42	*McPeek SJ, Kotnour JL, Glover M, Mbuyu N, Wright N; Kenyon College*	Searching for sexually dimorphic flight in Eastern bluebirds (*Sialia sialis*)

P3-43	*Barns BM, Martini J, Rankin B, Delaurentis T, Baier D; Providence College, Lincoln Memorial University, Dana Farber Cancer Institute*	Mobility and stability of the turkey (*Meleagris gallopavo*) humeroulnar joint
P3-44	*Roderick WRT, Chin DD*, Cutkosky MR, Lentink D; Stanford University*	Preparing for takeoff and sticking the landing: Bird behavior and biomechanics at the interface of flight and surface locomotion
P3-45	*Hoffmann KA, Chang E, Lentink D; Stanford University*	Towards Highly Maneuverable and Efficient Avian-Inspired Bio-Hybrid Flying Robots with Morphing Wings
P3-46	*Stevenson JPJ, Cheney JA*, Durston NE, Usherwood JR, Windsor SP, Bomphrey RJ; Univ of Bristol, Royal Vet. College*	Pose and shape changes of avian flight surfaces for control
P3-47	*Kassner Z, Muijres FT, Ribak G; Tel Aviv University, Wageningen University*	Wing kinematics during sideslip maneuvers in damselflies
P3-48	*Hsu SJ, Wang J, Dong H, Cheng B; Pennsylvania State University, University of Virginia*	Effects of Wing Flexibility on the Aerodynamic Performance of Blue Bottle Flies Flying in a Magnetic-Levitated Flight Mill
P3-49	*Orndorff C, Libby T, Daniel TL; University of Washington*	A haptic virtual reality device to probe motor integration in tethered moths
P3-50	*Switzer CM, Bustamante J, Daniel TL; Univ of Washington*	Learning a non-linear controller for insect flight dynamics with a deep neural network
P3-51	*Ngo T, Kasoju VT, Ford MP, Santhanakrishnan A; Oklahoma State University*	Aerodynamic effects of varying pause durations during clap and fling

Muscle Mechanics

P3-52	*Scibelli AE, Aonuma H, Trimmer BA; Tufts University, Hokkaido University*	Proleg muscles in *Manduca sexta*: Segmental differences suggest anteroposterior specialization.
P3-53	*Carr JA, Sullivan CM, Tytell ED; Salem State University, Emmanuel College, Tufts University*	Twitch Kinetics on the Descending Limb of the Length-Tension Curve of Skeletal Muscle.
P3-54	*Biondi AA, Bemis KE, Crawford CH, Flammang BE; New Jersey Institute of Technology, Virginia Institute of Marine Science*	*Mola mola* Mismatched Muscle Mechanics
P3-55	*Amplo HE, Crawford CH, Flammang BE; Rutgers University-Newark, New Jersey Institute of Technology*	Head, Shoulders, Elbows, Fins: Frogfish Fin Morphology
P3-56	*Gassler TR, Flammang BE; New Jersey Institute of Technology*	3D Modeling of Walking and Punting in the Little Skate, *Leucoraja erinacea*
P3-57	*Travitz LS, Moran CJ, Gerry SP, Coughlin DJ; Widener University, The Citadel, Fairfield University*	Seasonal Changes in Pectoral Fin Muscle Histology in Temperate Labrid Fishes
P3-58	*Hittle KA, Kwon ES, Coughlin DJ; Widener University*	Climate Change and Anadromous Fish: How Does Thermal Acclimation Affect the Mechanics of Myotomal Muscle of Atlantic Salmon, *Salmo salar*?
P3-59	*Cheu AY, Bergmann PJ; Clark University*	Ontogenetic allometry of locomotor performance in basilisks
P3-60	*Cuff AR, Daley MA, Michel KB, Allen VR, Lamas LP, Adami C, Monticelli P, Pelligand L, Hutchinson JR*; Royal Veterinary College*	Electromyographic Analysis of Appendicular Muscle Function in Extant Archosaurs
P3-61	*Michel KB, West TG, Daley MA, Allen V, Hutchinson JR; Royal Vet College*	A comparison of appendicular muscle physiology and biomechanics in Archosauria
P3-62	*Gorvet MA, Avey-Arroyo JA, Butcher MT*; Youngstown State University, The Sloth Sanctuary of Costa Rica*	Keep Calm and Hang On: EMG Activation Intensity in the Forelimb of Three-toed Sloths
P3-63	*Dramm CL, Orsbon CP, Vargeese JJ, Ross CF, Gidmark NJ; Knox College, University of Chicago*	The impact of gape on biting force of the masseter muscle in male and female macaque monkeys.
P3-64	*Boynton AM, Carrier DR; University of Utah, Salt Lake City*	The locomotor function of cervical muscles in humans
P3-65	*Carrier DR, Boynton AM; Univ Utah, Salt Lake City*	Is the Neck Part of the Human Core?

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P3-67	*Wolf CJ, Sasser KT, Senner NR, Cheviron ZA; Univ of Montana, Univ of South Carolina*	Landscape Genetics of *Peromyscus maniculatus* across the Colorado Front Range
P3-68	*Atkins EL, Tinhan TC, Wells RJD, Alvarado-Bremer JR; Texas A&M University Galveston*	Estimating levels of gene flow of a large coastal shark, *Carcharhinus leucas*, in the Gulf of Mexico

P3-69 *Peramba KB, Nash C, Walters D, Hackworth L, Schumm M, Pineda O, Edsinger E; The Marine Biological Laboratory, The University of Chicago*
Squid Monday: Characterizing population structure in *Doryteuthis pealeii*

P3-70 *Sheridan NE, Seyoum S, Titus BM, Daly M, Schrey A, Richards C; Univ of South Florida, Florida Fish and Wildlife Consv Comm, The American Museum of Natural History, The Ohio State Univ, Georgia Southern Univ*
Genetic Differentiation in the Giant Caribbean Sea Anemone *Condylactis gigantea* in Florida, U.S.

P3-71 *Chang ES, Cartwright P; University of Kansas*
Identification of conserved genetic elements within the cnidarian class Hydrozoa and their utility for detection of cryptic genetic diversity in the holopelagic jellyfish *Liriope tetraphylla*

Life-History Evolution

P3-72 *Dulskiy AB, Orselli K, Von Dassow G; College of the Holy Cross, California State University, Oregon Institute of Marine Biology*
Effect of Simulated Egg Size Reduction on Larval Performance in *Dendraster excentricus*

P3-73 *Foley KJ, McAlister JS; College of the Holy Cross*
Egg Size, Composition, and Energy in Suspected Hybrid *Asterias* Seastars

P3-74 *Aljeboure SS, McAlister JS; College of the Holy Cross*
Investigating Maternal Effects in the Sea Anemone, *Nematostella vectensis*, from Chronic Exposure to 17β-Estradiol.

P3-75 *Cirino LA, Moore PJ, Miller CW; University of Florida, University of Georgia*
The effect of dynamic diets on female reproductive traits

P3-76 *Brandfon SH, Cirino LA, Miller CW; University of Florida*
The effect of juvenile and adult diet on female fecundity and longevity

P3-77 *Kotnour JL, Glover M, Mbuyu N, McPeek S, Wright NA; Kenyon College*
Interactions of life history traits and locomotion investment across the avian tree

P3-78 *Hoekstra LH, Judson JM, Janzen FJ, Bronikowski AM; Iowa State University*
Quantitative Genetics of Life History in a Population of Long-Lived Reptiles

P3-79 *Kolonin AM, Calvillo PA*, Aspbury AS, Gabor CR; Texas State University*
Land Use Conversion Affects Stress and Life-History of Stream Fish

P3-80 *Rosso AA, Nicholson D, Chung AK, Curlis JD, Knell R, Graner T, Logan M, McMillan WO, Cox CL; Georgia Southern University, Queen Mary University, University of Michigan, Smithsonian Tropical Research Institute*
Ectoparasites and the Expression of Sexual Signals in a Tropical Lizard

P3-81 *Chan SF, Wang W; Guangdong Ocean University*
Molecular characterization of the myostatin cDNA (MrMstn) from the fresh water shrimp Macrobrachium rosenbergii

P3-82 *Anderson T, Glass J, Johnson D, Stahlschmidt Z; USDA-ARS, Univ Pacific*
Predicting variation in life-history traits using multilayer environmental and physiological networks

Bioindicators and Pollution

P3-83 *Hitt LG, Blanchette A, Khalil S, Finkelstein ME, Ribeiro RD, Iverson ENK, McClelland SC, Karubian J; Tulane Univ, Univ of California, Santa Cruz, Royal Holloway Univ of London*
Effects of Lead Exposure on Reproductive Success and Extra-Pair Paternity in the Northern Mockingbird

P3-84 *Prior JH, Whitaker JM, Janosik AM; University of West Florida*
An Exploration of the Epigenetic Effects of Microplastics Exposure on the Common Mysid Shrimp, *Americamysis bahia*

P3-85 *Dawson KR, Lightsey J, Douglas K, Dzikunu G, Sousa J, Short Z, Allen L; Winston Salem State University*
Assessing Ecological Water Quality Along a Creek: Preliminary Data

P3-86 *Glynn KJ, Zahor DL, Chiparus CL, Cornelius JM; Eastern Michigan University*
Body Condition and Feather Coloration of Urban Vs. Rural American Goldfinches (*Spinus tristis*) and American Robins (*Turdus migratorius*)

P3-87 *Zahor DL, Glynn KJ, Chiparus SL, Cornelius JM; Eastern Michigan University*
Species, age and foraging-niche variation in blood lead levels in urban and rural songbirds

P3-88 *Awali S, Abdulelah SA, Crile KG, Yacoo KE, Torres VC, Dayfield DJ, Almouseli A, Evans KR, Belanger RM; University of Detroit Mercy*
Exposure to environmentally-relevant concentrations of atrazine causes changes in cytochrome P450 and glutathione-S-transferase activity in the hepatopancreas of crayfish (*Faxonius virilis*)

P3-89 *Hartman RA, Griesback K, Scott KS, Tobe S, Landberg T; Arcadia University*
Heavy metal contamination of common snapping turtles in the Lower Delaware River watershed

P3-90 *Cullen JA, Hala D, Marshall CD; Texas A&M University* — Influence of Feeding Ecology on Accumulation of PAHs and PCBs in Three Sympatric Shark Species

P3-91 *Paulson DM, Patterson LN, Covi JA; Univ of North Carolina at Wilmington* — Using Model Species to Explain the Effects of Coal Combustion Residual Contamination on a Zooplankton Community

P3-92 *Griesback K, Hartman R, Tobe S, Scott K, Landberg T; Arcadia University* — Heavy Metal Contaminants in Snapping Turtle Soup from the Philadelphia Area

P3-93 *Bralley JP, Cory W, Welch AM; College of Charleston* — Behavioral Effects of Fluoxetine and Sertraline and their Photodegradants on Southern Toad (*Anaxyrus terrestris*) Tadpoles

P3-94 *Chiparus SL, Zahor DL, Glynn KJ, Cornelius JM; Eastern Michigan University* — The influence of metal exposure on plumage coloration in several songbird species

P3-95 *Onthank KL, Culler ME; Walla Walla University* — An Inexpensive pH-stat System Based on Open Hardware for Ocean Acidification Research

P3-96 *Korotasz AM, Bryan AL; Savannah River Ecology Lab* — Accumulation of ^{137}Cs by Carnivorous Aquatic Macrophytes (*Utricularia spp.*) on the Savannah River Site

P3-97 *Sandoval Herrera NI, Welch KC; University of Toronto* — Sublethal Effects of Neurotoxic Pesticides on Bats: from Cells to Behavior

P3-98 *Hewins B, Rideout A, Harding W, MacDonald E, Ferguson L, Gibson G*; Acadia University* — Effects of Environmentally-Relevant Levels of Microplastics on Tissue Structure in *Mytilus edulis* (Blue Mussels)

P3-99 *Sandoval-Herrera N, English SG, Bishop CA, Elliott JE, Welch KC; University of Toronto, Environment and Climate Change Canada* — Effects of neonicotinoid insecticides on hummingbirds

Osmoregulation and Ion Transport

P3-100 *Charmantier G, Lorin-Nebel C, Mathers N, Gerber L, Lee CE; Univ of Montpellier, Univ of Wisconsin* — Key ion transporters Na^+/H^+ antiporter (NHA), V-H^+-ATPase (VHA) and Na^+/K^+-ATPase (NKA) are implicated during evolutionary transitions from saline to freshwater habitats in the copepod *Eurytemora affinis*

P3-101 *Murphy MS, Secor SM, Denardo DF; University of Alabama, Arizona State University* — Snakes Must Drink: Meal Consumption does not Improve Hydration State

P3-102 *Willis SC, Winemiller KO, Rocha LA; California Academy of Sciences, Texas A&M University* — Osmoregulatory evolution in freshwaters: Juxtaposition of differentially expressed genes and outlier loci of an Amazon cichlid in contrasting pH and ionic environments

P3-103 *An D, Husovic A, Ali L, Weddle-Pittman E, Nagle L, Ahearn GA; Univ of North Florida* — Ocean acidification: Synergistic inhibitory effects of protons and heavy metals on ^{45}Ca uptake by lobster branchiostegite membrane vesicles

P3-104 *Jacobs F, Ahearn GA; University of North Florida* — Effects of aquatic acidification on ^{45}Ca uptake by gill epithelia of white river shrimp *Litopenaeus setiferus*

P3-105 *Moffitt M, Rehman F, Ahearn G; University of North Florida* — Preliminary study: Effects of cell density and media changes in *Homarus americanus* primary cell culture on 3D matrices

Molecular Physiology

P3-106 *Benrabaa SA, Mykles DL; Colorado State Univeristy* — Effect of blocking TGFβ/activin signaling on hemolymph ecdysteroid titers and expression of Halloween and ecdysteroid-responsive genes in the molting gland (Y-organ) of the blackback land crab, *Gecarcinus lateralis*

P3-107 *Finger JW, Hamilton MT, Kelley MD, Zhang Y, Kavazis A, Glenn TC, Tuberville TD; Auburn University, University of Georgia* — Selenium exposure and its effects on oxidative status in the American alligator (*Alligator mississippiensis*)

P3-108 *Saffold CE, Linser PJ; University of Tennessee at Martin, Whitney Laboratory for Marine Bioscience* — The Molecular Physiology of Carbon Dioxide in the Larval Mosquito Tracheal System

P3-109 *Rimkevicius T, Jarrett A, Ivanina AV, Sokolova IM; University of North Carolina at Charlotte, University of Pittsburgh, University of Rostock* — Effects of salinity on activity of key biomineralization and acid-base regulation enzymes of *Mercenaria mercenaria*

P3-110 *Brockman TJ, Menze MA; University of Louisville* — Two Late Embryogenesis Abundant Proteins Do Not Protect Enzyme Activity During Desiccation in Cell Lysates

P3-111 *Gonzalez A, Ochrietor J, Ahearn G; University of North Florida* — Molecular Characterization of a Novel Disaccharide Transport Protein in *Homarus americanus*

P3-112	*Jimenez AG, Elliott KH; Colgate University, McGill University*	Measures of oxidative stress do not vary with age in thick-billed murres (*Uria lomvia*)
P3-113	*Llewellyn HJ, Smith EN, Surmacz CA, Hranitz JM; Bloomsburg University*	Sublethal Effects of the Neonicotinoid Imidacloprid on Cellular Stress in the Honey Bee Brain
P3-114	*Thomas PA, Lopez-Legentil S, Wilbur AE, Kinsey ST; University of North Carolina, Wilmington*	Effects of Air Exposure on Markers of Oxidative Damage in an Invasive Tunicate (*Styela plicata*) and a Native Shellfish (*Crassostrea virginica*)
P3-115	*Hall AM, Zardus JD, Bowden JB, McFee WE, Napolitano MN; College of Charleston, The Citadel, University of Florida Veterinary School, NOAA, NIST*	A Lipidomic Approach to identifying Immune Response in Cetacean Skin to the Attachment of the Tassel Barnacle *Xenobalanus globicipitis*
P3-116	*Bryan A, Wilcoxen TE, Seitz J, Nuzzo JN; Millikin University, Illinois Raptor Center*	Enhanced Hematological Condition in Birds of Prey Undergoing Rehabilitation is Independent of Vitamin Supplementation.
P3-117	*Nieves NA, Arner A, Tobler M, Barts N; Kansas State University, Penn State University*	Reactive oxygen species and their role in H2S toxicity in Poecilia mexicana
P3-118	*McCrary MB, Duncheon EJ, Allen HC, O'Keefe JM, Champagne AM; University of Southern Indiana, The Ohio State University, Indiana State University*	Molecular interactions in bat skin suggest convergent evolution with birds
P3-119	*Duncheon EJ, McCrary MB, O'Keefe JM, Champagne AM; Univ of Southern Indiana, Indiana State Univ*	Lipid Composition in Bat Skin Reflects the Demands of Flight
P3-120	*Dilts S, Sarajlic D, Judd ET, Hatle JD, Paterson C; Univ of North Florida, Agios Pharmaceuticals, Florida State College at Jacksonville*	Inhibition of hydrogen sulfide production by fat body of lubber grasshoppers
P3-121	*Nzima MZ, Kolape J, Shipley M, Watson CM; Midwestern State University*	Chitinase activity during digestion of insect prey by the Ground Skink, *Scincella lateralis*
P3-122	*Webb EA, McGraw KJ; Arizona State University, Tempe*	Variation in Tissue Carotenoid Profiles: A Tale of Two Species
P3-123	*Carson KMH, Rashid SB, Lawson ER, Moss AG; Auburn University, University of Georgia*	Purification and identification of an exceptionally resilient orange fluorescent protein from a novel species of anemone, a variant of the Gulf anemone *Calliactis tricolor*
P3-124	*Swall ME, Benrabaa SA, Mykles DL; Colorado State University*	Characterization of *Shed* genes in the molting gland (Y-organ) of the land crab, *Gecarcinus lateralis*

Complementary to S10: The World is Not Flat: Accounting for the Dynamic Nature of the Environment as We Move Beyond Static Experimental Manipulations

P3-125	*Brandt EE, Kamath A, Elias DO; University of California, Berkeley*	Thermal Ecology in Miniature: Microhabitat Usage in the Context of Physiological and Behavioral Performance in a Spider
P3-126	*Earls KN, Porter MS, Rinehart JP, Greenlee KJ; North Dakota State University, Pennsylvania State University, USDA-ARS*	Effects of Cold Stress on Reproductive Fitness in the alfalfa leafcutting bee, *Megachile rotundata*
P3-127	*Calhoun AC, Sadd BM; Illinois State University*	The Influence of Multiple Stressors of a Fungicide and Microsporidian Parasite on Bumble Bee Health
P3-128	*Padda SS, Glass J, Stahlschmidt ZR; U. Pacific*	Effects of heat wave and water limitation in an insect—from life history to behavior and physiology
P3-129	*Marroquin-Flores RA, Mortimer NT, Paitz RT, Bowden RM; Illinois St U*	Cold-inducible RNA-binding protein may regulate gonadal development in the red-eared slider turtle
P3-130	*Breitenbach AT, Carter AW, Paitz RT, Bowden RM; Illinois St U, U Tennessee*	Heat Wave Timing, Continuity, and Length Affect Temperature-dependent Sex Determination in a Freshwater Turtle
P3-131	*Turner MK, Tiatragul S, Hall JM, Warner DA; Auburn University*	Testing Different Methods for Creating Ecologically-relevant Incubation Temperatures in the Lab
P3-132	*Cuevas-Sanchez AY, Miller A, Dowd WW; Washington State University*	Heat induced stressors in a changing environment: Thermal preference and activity assay of *Tigriopus californicus*
P3-133	*El Saadi M, MacMillan HA*; Carleton University*	Recovery Time, Survival, and Hyperkalemia During Fluctuating Thermal Regimes in *Drosophila melanogaster*

Evolutionary Ecology and Physiology

P3-134	*Smith EB, Tsunekage T, Levin II; Agnes Scott College*	Do Barn swallows (*Hirundo rustica erythrogaster*) leave a signature maculation pattern on their eggs?

P3-135 *Bergstrom CA; Univ of Alaska Southeast* — Are ecological consequences of whole-body asymmetry polymorphism similar in both derived and basal flatfish species?

P3-136 *Ashlock LW, Pespeni MH; University of Vermont* — Developmental and transgenerational impacts of extreme temperature events in copepods

P3-137 *Lattanzio M; Christopher Newport Univ* — Parallel Patterns of Climate-Mediated Spatial and Temporal Morph Turnover in a Color Polymorphic Species

P3-138 *Ibrahim AS, Hund AK, Stephens JQ, Wicker VV, Tsunekage T, Safran RJ, Levin II; Agnes Scott College, University of Colorado - Boulder* — The effects of sex and growth rate on variation in nestling telomere length

P3-139 *Schrey A, Russell A, Liebl A; Georgia Southern University, University of Exeter, University of South Dakota* — Temporal Variation in DNA Methylation Among Chestnut Crowned Babbler from Three Developmental Periods

P3-140 *Cieri RL, Farmer CG; University of Utah, Trinity College* — Investigation of pulmonary airflow patterns in monitor lizards using computational fluid dynamics (*Varanidae*)

P3-141 *Lenga SH, Cirino LA, Miller CW; University of Florida* — Effects of Autotomy on Sperm Depletion in *Narnia femorata*

P3-142 *Ballinger MA, Treidel LA, Nachman MW; University of California, Berkeley* — Physiological, morphological, and behavioral plasticity to cold acclimation in temperate and tropical house mice

P3-143 *Husak JF, Lailvaux SP; Univ of St. Thomas, Univ of New Orleans* — Is the exercise response adaptive?

P3-144 *Julick C, Tenger-Trolander A, Green A, Kronforst M, Montooth K; Univ of Nebraska-Lincoln, Univ of Chicago, Univ of Michigan* — Divergence in metabolic plasticity in response to seasonal rearing conditions among migratory and non-migratory populations of monarch butterflies (*Danaus plexippus*)

P3-145 *Egan JP, Bloom DD, Simons AM; University of Minnesota, Western Michigan University* — Phylogenetic Analysis of Trophic Niche Evolution and Spatial Patterns of Herbivory in Clupeoidei (Herrings, Anchovies, and Allies)

P3-146 *Verhagen I, Laine VN, Mateman AC, Pijl A, Kamphuis W, Gienapp P, Van Oers K, Visser ME; NIOO-KNAW, NIN-KNAW* — Assessing individual gene expression patterns in the reproductive axis in relation to timing of reproduction in the great tit (*Parus major*)

P3-147 *Dzialo M, Bryla A, Demoranville K, Sadowska ET, Trost L, Pierce BJ, McWilliams SR, Bauchinger U; Jagiellonian University, University of Rhode Island, Max Planck Institute for Ornithology, Sacred Heart University* — Dietary Antioxidants Modulate Metabolism And Organ Sizes in Migratory Birds

P3-148 *Mounger JM, Hughes AR, Gehring CA, Robertson MH, Voors S, Richards CL; University of South Florida, Northeastern University, Northern Arizona University* — Effects of genetic diversity and epigenetic change on trait variation in the foundation plant *Spartina alterniflora*

P3-149 *Dodson AN, Outomuro D, Wiatr A, Morehouse NI; University of Cincinnati, Purdue University* — Motley views: Investigating the importance of receiver vantage point in shaping the appearance of a myrmecomorph spider

P3-150 *Kahn AS, Lord JP, Katija K, Barry JP; Monterey Bay Aquarium Research Institute, Moravian College* — Respiration and Water Processing by Glass Sponges in Sur Ridge, a Dense, Deep-water Coral and Sponge Habitat

P3-151 *Levy O, Noronha C, Telemeco RS, Angilletta MJ; Tel Aviv University, Federal University of Goias, California State University, Arizona State University* — Metabolic Depression During Winter Could Mitigate Impacts of Climate Change on lizards

P3-152 *Murphy KM, Bodensteiner BL, Delaney DM, Strickland JT, Janzen FJ; Auburn University, Virginia Polytechnic Institute and State University, Iowa State University, U. S. Fish and Wildlife Service* — Nest Temperatures Alter Survival and Emergence of Painted Turtle (*Chrysemys picta*) Offspring

P3-153 *Iyengar EV; Muhlenberg College* — As the world warms: Hydration status of a native (*Ariolimax columbianus*) and invasive (*Arion rufus*) slug in the temperate rainforest

P3-155 *Wang Q, Hernandez-Ochoa E, Blum I, Viswanathan M, Granger J, Yang J, Lovering R, Schneider M, Cammarato A, Wu M, Bever G, Anderson M; Johns Hopkins Univ, Univ of Maryland* — A Critical Role for Oxidative Regulation of CaMKII in the Origin of Vertebrates

Population Ecology and Genetics

P3-156 *Jamal FA, Kowalewski MJ, Paulay G; University of Florida* — Pinnotherid Crabs and Their Sand Dollar Hosts, Eastern Gulf of Mexico

P3-157 *Tompkins ET, Anderson DJ; Wake Forest University* Breeding Responses to the El Niño Southern Oscillation are Age- and Trait- Dependent in a Long-Lived Seabird

P3-158 *Abate PJ, Ramsay CN; Mitchell College* Morphometric analysis of the non-indigenous bryozoan *Tricellaria inopinata*

P3-159 *Love CN, Flynn RW, Lance SL; Univ of Georgia* DNA Methylation Patterns in Amphibians Populations with Differing Contaminant Exposure Histories

P3-160 *Pekar KJ, Onthank KL; Walla Walla University* Diet analysis of the burrowing octopus *Muusoctopus leioderma* using stable isotopes and sequencing

P3-161 *Gilchrist SL, Rodriguez L; New College of Florida* Trash or Treasure: Land Hermit Crab Use of Found Objects at Cayos Cochinos, Honduras

P3-162 *Brown CE, Whiteman HH, Deban SM; University of South Florida, Murray State University* Within-pond Site Fidelity of Larval, Paedomorphic, and Metamorphic Arizona Tiger Salamanders, *Ambystoma tigrinum nebulosum*

P3-163 *Flock TM, Kramer AM, Lajeunesse MJ; University of South Florida* The Cost of Trait-Mediated Interactions and Indirect Effects within Predator-Prey Dynamics

P3-164 *Warner DA, Hall JM, Hulbert A, Tiatragul S, Pruett J, Mitchell TS; Auburn University* Recent Extinction of a Viable Tropical Lizard Population from a Temperate Area

Immunity and Immune-Based Trade-Offs

P3-165 *McDonald JY, Lusk E, Savici S, Casto JM; Illinois State University* Ectoparasites, Developmental Trade-offs, and Inflammation

P3-166 *Goessling JM, Ward C, Mendonca MT; Eckerd College, Auburn University Montgomery* Tradeoffs Between Acute and Chronic Thermal and Immune Acclimation in Common Musk Turtles *Sternotherus odoratus*

P3-167 *Marshall AS, Mullins H*, Urista CY, Davis JE; Radford University* Heterophil/Lymphocyte Ratio as a Measure of Immune Response in Humans Exposed to a Novel Microbiome

P3-168 *Carpenetti JM, Stierhoff EN, Diamantides LC, Wallace JW, Butler MW; Lafayette College* Survival of house sparrows seems to decrease only in response to high-intensity immune challenges

P3-169 *Rohlf CM, Husak JF; Univ of St Thomas* The Effects of Varying Immune Challenges on Performance Traits in Green Anole Lizards

P3-170 *Virgin EE, French SS; Utah State University* Effect of immune challenge on metabolism and oxidative capacity in the Side-blotched lizard (*Uta stansburiana*) across reproductive stages

P3-171 *Kepas ME, Virgin EE, Hudson SB, Webb AC, French SS; Utah State University* Sex Differences in the Metabolic Rates of Uta stansburiana in Relation to Oxidative Stress

P3-172 *Schultz EM, Angelo CM, Brush JJ, Reichard DG; Kenyon College, Ohio Wesleyan University* The Effect of a Short-term Stressor on Immune Investment in Female House Wrens Using a Simulated Predation Attempt

P3-173 *Oakey SJ, Schoenle LA, Downs CJ, Martin LB; University of South Florida, Hamilton College* Brains, Sickness, and Longevity: Does a Relationship Between Brain Size and Immunity Underlie Variation in Survival Rates?

P3-174 *Zamacona Gonzalez R, Wilcoxen TE, Zimmerman LM; Millikin University* Isotype switching and spleen development in *Rana catesbeiana*

P3-175 *Amonett SD, Balenger SL; University of Mississippi* Maternal Effects in Response to *Mycoplasma gallisepticum* Infection in Eastern Bluebirds

P3-176 *Surbaugh KL, Rohr JR; University of South Florida* Assessing acquired resistance of the adult Cuban Treefrog (Osteopilus septentrionalis) to the pathogenic chytrid fungus (Batrachochytrium dendrobatidis)

P3-177 *Tassia MG, Halanych KM; Auburn University* Evolution of pattern-recognition receptor pathways and the identification of novel domain architectures in Deuterostomia

P3-178 *Brusch Iv GA, Heulin B, Denardo DF; Arizona State University, University of Rennes* Dehydration During Egg Production Alters Egg Composition and Yolk Immune Function

Developmental Biology: Regeneration and Disease

P3-179 *Bittencourt JB, Armfield BA, Stanley EL, Cohn MJ; University of Florida* Nanoscale Computed Tomography (NanoCT) Analysis of Lower Genitourinary Tract Development

P3-180 *Armfield BA, Carroll A, Cohn MJ; University of Florida* Hedgehog Signaling Initiates Genital Tubercle Development

P3-181	*Nunez SA, Sanger TJ; Loyola University Chicago*	The Effects of Hypoxia and Heat on Early and Late Development of Lizard Embryos
P3-182	*Famuyiwa T; Florida Atlantic University*	ABC Transporter Mediated Multidrug Resistance in Prostate Cancer
P3-183	*Gonzalez P, Chrysostomou E, Flici H, Gahan JM, Schnitzler CE, Frank U, Baxevanis AD; NHGRI/NIH, NUI Galway, U. Florida*	From Stem Cell to Neuron: Transcriptional Profiling of Differentiating Neurons in the Cnidarian *Hydractinia*
P3-184	*Caoili EC, Quiroga-Artigas G, Schnitzler CE; University of Florida*	Determining the Expression Patterns of Two *Brachyury* Paralogs in *Hydractinia* Head Regeneration
P3-185	*Wyeth A, Quiroga Artigas G, Schnitzler CE; Hope College, Whitney Laboratory for Marine Bioscience*	A detailed head regeneration timeline in the cnidarian *Hydractinia symbiolongicarpus*
P3-186	*Quiroga-Artigas G, Bradshaw B, Gahan J, Sanders N, Barreira S, Jones A, Baxevanis A, Frank U, Schnitzler C; Whitney Lab, UF, National University of Ireland, NHGRI, National Institutes of Health*	Transcriptomic profiling of head regeneration in the cnidarian *Hydractinia*
P3-187	*Popsuj SE, Seaver EC; Agnes Scott College, University of Florida Whitney Laboratory of Marine Bioscience*	Investigation of Wnt signaling during posterior regeneration of the annelid *Capitella teleta*

Monday Schedule of Events

Events take place in the Tampa Convention Center, unless otherwise noted

EVENT	TIME	LOCATION
Speaker Ready Room	7:00 AM – 10:00 AM	Room 11
Registration	7:30AM – 2:30PM	Central Exhibit Hall
Coffee Break AM	9:30 AM – 10:30 AM	Exhibit Hall Foyer
SPECIAL LECTURE		
Moore Lecture: Dr. Kevin Padian Lessons from the "Intelligent Design" Trial: Explaining Evolution and Climate Science in a "Post-Evidentiary World"	3:45 PM – 4:45 PM	Room 14-17
SYMPOSIA ORAL PRESENTATIONS		
S10: The World is Not Flat: Accounting for the Dynamic Nature of the Environment as We Move Beyond Static Experimental Manipulations Chairs: Timothy Greives, Rachel Bowden	8:20 AM – 3:30 PM	Room 1 & 2
S11: Allometry, Scaling and Ontogeny of Form Chairs: Fred Nijhout, Kenneth McKenna	8:00 AM – 3:30 PM	Room 14 & 15
S12: The Path Less Traveled: Reciprocal Illumination of Gecko Adhesion by Unifying Material Science, Biomechanics, Ecology, and Evolution Chairs: Timothy Higham, Alyssa Stark, Anthony Russell	7:45 AM – 3:30 PM	Room 16 & 17
CONTRIBUTED PAPER ORAL PRESENTATIONS		
MORNING		
Session 108: Comparative Endocrinology-Differences & Similarities	8:00 AM – 9:45 AM	Room 3 & 4
Session 109: Neuroethology	8:00 AM – 9:45 AM	Room 5 & 6
Session 110: Evolution and Stressors	8:00 AM – 9:45 AM	Room 13
Session 111: Living & Moving in Groups	8:00 AM – 9:45 AM	Room 18
Session 112: Livin' the Vida Larvae - Larval Ecology	8:15 AM – 9:45 AM	Room 19
Session 113: Physiology of Feeding and Digestion	8:00 AM – 10:00 AM	Room 20
Session 114: Sexual Selection and Reproductive Behavior	8:00 AM – 9:45 AM	Room 21
Session 115: Dolphin vs. Tuna	8:00 AM – 9:30 AM	Room 22
Session 116: Dig Deep	8:00 AM – 9:30 AM	Room 23
Session 117: You Should Chew Your Food	8:15 AM – 9:30 AM	Room 24
Session 120: Environmental Endocrinology: Animals Dealing with a Messed Up World	10:15 AM – 12:00 PM	Room 3 & 4
Session 121: Evolutionary Thermal Biology	10:00 AM – 11:45 AM	Room 5 & 6
Session 122: Evolution and Coloration	10:30 AM – 11:45 AM	Room 13
Session 123: You Are What You Eat - Bioindicators	10:30 AM – 12:00 PM	Room 18
Session 124: Finding the Way, Finding Home	10:15 AM – 11:45 AM	Room 19
Session 125: Ecological and Evolutionary Consequences of Metabolic Diversity 2	10:45 AM – 12:00 PM	Room 20
Session 126: Species and Speciation	10:15 AM – 11:45 AM	Room 21
Session 127: Squishy Swimmers	10:00 AM – 11:45 AM	Room 22
Session 128: Slippery Slope	10:00 AM – 11:30 AM	Room 23
Session 129: Up the Flow and Down the Hatch	10:00 AM – 11:30 AM	Room 24
Session 133: Immune Trade-Offs	8:00 AM – 10:00 AM	Room 25

AFTERNOON

Session 132: Dynamics of Predator-Prey Interactions	1:30 PM – 3:00 PM	Room 3 & 4
Session 134: Evolutionary Ecology	1:30 PM – 3:30 PM	Room 13
Session 136: Complementary to S7: Comparative Evolutionary Morphology and Biomechanics in the Era of Big Data	1:30 PM – 3:15 PM	Room 19
Session 137: Character Development and Evolution	1:30 PM – 3:15 PM	Room 21
Session 138: Bird Flight	1:30 PM – 3:30 PM	Room 22
Session 139: Flow through Tight Spaces	1:30 PM – 3:15 PM	Room 23
Session 140: Flying through Water and Swimming on Land	1:30 PM – 3:00 PM	Room 24
Session 141: Evolution of Behavior	1:30 PM – 3:00 PM	Room 18

COMMITTEE AND BOARD MEETINGS

Executive Committee	7:00 AM – 9:00 AM	Florida Salons 1-3, Marriott
Public Affairs Committee	12:00 PM – 1:30 PM	Marriott Hotel Restaurant
IOB Editorial Board Meeting	12:00 PM – 1:30 PM	Room 8

WORKSHOPS AND PROGRAMS

Evolutionary Biomechanics Mentoring and Networking Luncheon	12:00 PM – 1:30 PM	Room 1
NSF Program Officers: Functional genomics resources and the EDGE program	12:00 PM – 1:30 PM	Room 12

SOCIAL EVENTS

Society-wide social in honor of students and post-docs	5:00 PM – 7:00 PM	Ballroom A

Tuesday 8 January

Particle image velocimetry for experimental biology: principles, implementation, and a hands-on session

8:00 AM – 6:00 PM, Room 5-6, Marriott

Particle Image Velocimetry (PIV) is a visualization technique used to measure fluid flows. Despite the usefulness of PIV for understanding the interaction between animals and the flow around them, the application of PIV in experimental biology is limited. This workshop is aimed at biologists who are interested in integrating PIV in their research, or are interested in better understanding the principles and implementation of the method. The workshop will cover PIV fundamentals such as system setup, image acquisition, analysis and post-procession. it will also include a hands-on session with PIV systems and MATPIV (BYO laptop). The workshop will be led by Roi Gurka (Costal Carolina University), Roi Holzman (Tel Aviv University), and Brooke Flammang (New Jersey Institute of Technology/Rutgers University). *Sponsored by TSI*.

Monday Program Symposia

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

8:20 AM – 3:30 PM **Session S10** **Room 1 & 2**

The World is Not Flat: Accounting for the Dynamic Nature of the Environment as We Move Beyond Static Experimental Manipulations

Chairs: Timothy Greives, Rachel Bowden

8:20 am	**S10-1**	*Greives T, Bowden RM*; North Dakota St U, Illinois St U*	The world is not flat: accounting for the dynamic nature of the environment as we move beyond static experimental manipulations
8:30 am	**S10-2**	*Angilletta MJ, Levy O, Sears MW, Vandenbrooks JM; Arizona State University, Tel Aviv University, Clemson University, Midwestern University*	The Fundamental Flaws of Fundamental Niche Models
9:00 am	**S10-3**	*Carter AW, Paitz RT, Bowden RM; U Tennessee, Illinois St U*	The devil is in the details: natural variation in maternal estrogens and temperature are key to understanding TSD
9:30 am	**S10-4**	*Tobin Kerrigan, Sadd BM*; Illinois State University*	in the Heat of the Moment: Host Immunity and Parasite Resistance in the Face of Thermal Shifts and Stress
10:00 am	**Coffee Break**		**Exhibit Hall Foyer**
10:30 am	**S10-5**	*Sears MW, Riddell EA, Angilletta MJ; Clemson University*	Shifting environmental stressors across ontology in vertebrate ectotherms
11:00 am	**S10-6**	*Greenlee KJ, Bowsher JH, Rinehart JP, Yocum GD; North Dakota State Univ, USDA-ARS*	Beneficial effects of fluctuating thermal regimes: Increasing insect survival of low temperature stress
11:30 am	**S10-7**	*Stager M, Cheviron Z; University of Montana*	An analytical framework for dissecting complex traits: a case study of avian physiological flexibility to cold acclimation
12:00 pm	**Lunch Break**		
1:30 pm	**S10-8**	*Greives TJ, Graham JL, Bauer CM; North Dakota State University, Centre d'Ecologie Fonctionnelle et Evolutive, Adelphi University*	Daily rhythms in hormones and behavior, seasonal timing and reproductive success
2:00 pm	**S10-9**	*Welch AM, Infante A, Reining A; College of Charleston, Academic Magnet High School, South Carolina Governor's School for Science and Mathematics*	When You Get Salty: Developmental Timing and the Consequences of Salinity Exposure in Toad Tadpoles
2:30 pm	**S10-10**	*Durant S; Univ of Arkansas*	Parental incubation behavior is a key link between environmental conditions and avian phenotype
3:00 pm	**S10-11**	*Zera AJ; University of Nebraska*	Time has come today. The importance of hormonal circadian rhythms underlying daily-rhythmic life history adaptation
3:30 pm	**Coffee Break**		**Exhibit Hall Foyer**

8:00 AM – 3:30 PM **Session S11** **Room 14 & 15**

Allometry, Scaling and Ontogeny of Form

Chairs: Fred Nijhout, Kenneth McKenna

8:00 am	**S11-1**	*Rodriguez RL, Eberhard WG; Univ of Wisconsin, Univ de Costa Rica, Louisiana State Univ*	Sexual Selection and Static Allometry: the Importance of Behavior and Function
8:30 am	**S11-2**	*O'Brien D; Colby College*	Canine Evolution in a Saber-toothed Cat (Smilodon fatalis): Static Scaling and Evidence of Natural Selection
9:00 am	**S11-3**	*Niklas KJ; Cornell University*	Biophysical Effects on the Scaling of Plant Ontogeny
9:30 am	**Coffee Break**		**Exhibit Hall Foyer**

10:00 am	**S11-4**	*Shingleton AW; Univ of Illinois at Chicago*	Which line to follow? The utility of different line-fitting methods to capture the mechanism of morphological scaling
10:30 am	**S11-6**	*Casasa S, Zattara EE, Moczek AP; Indiana University, INIBIOMA, CONICET*	Developmental regulation and evolution of nutrition-responsive growth in horned beetles
11:00 am	**S11-7**	*McKenna KZ, Nijhout HF; Duke University*	Exploring the role of insulin signaling in relative growth: a case study on wing-body scaling in Lepidoptera
11:30 am		**Lunch Break**	
1:30 pm	**S11-8**	*Hallgrimsson B, Katz DC, Aponte JD, Gonzalez PN, Larson JR, Devine JP, Marcucio RS; University of Calgary, CONICET, Argentina*	Integration and the Developmental-Genetics of Allometry
2:00 pm	**S11-9**	*Saxena A, Sharma V, Gutierrez H, Erberich J, Tan F, Ellis C, Hiller M, Cooper K*; University of California, San Diego, Max Planck Institute, Dresden*	What Big Feet You Have! Scaling Skeletal Proportion During Development and Evolution
2:30 pm	**S11-10**	*Houle D, Fortune R, Jones LT; Florida State University*	Excavating burden: revealing the causes of stasis in allometry
3:00 pm	**S11-11**	*Frankino WA, Shingleton AW, Dworkin I, Bakota E, Wilkinson GS, Wolf JB; University of Houston, University of Illinois, Chicago, McMaster University, University of Maryland, University of Bath*	Individual Cryptic Scaling Relationships and the Evolution of Animal Form
3:30 pm		**Coffee Break**	**Exhibit Hall Foyer**

7:45 AM – 3:30 PM **Session S12** **Room 16 & 17**

The Path Less Traveled: Reciprocal Illumination of Gecko Adhesion by Unifying Material Science, Biomechanics, Ecology, and Evolution

Chairs: Timothy Higham, Alyssa Stark, Anthony Russell

7:45 am	**S12-1**	*Russell AP, Stark A, Higham T; Univ of Calgary, Canada, Villanova Univ, Univ California, Riverside*	Understanding gecko adhesion: toward an integration of evolutionary, ecological biomechanical and biomimetic approaches.
8:00 am	**S12-2**	*Stark AY; Villanova University*	Stick or Slip: Adhesive Performance of Geckos and Gecko-inspired Synthetics in Wet Environments
8:30 am	**S12-3**	*Gamble T; Marquette University*	Genome evolution and the origins of gecko adhesion
9:00 am	**S12-4**	*Drotlef DM, Dayan CB, Sitti M*; Max Planck Institute for Intelligent Systems*	Gecko-inspired composite microfibers for reversible adhesion on smooth and rough surfaces
9:30 am	**S12-5**	*Higham TE, Russell AP, Niewiarowski PN, Wright AN, Speck T; Univ of California, Riverside, Univ of Calgary, Univ of Akron, Univ of Hawaii, Univ of Freiburg*	Adhering to nature: the importance of incorporating ecologically relevant information in the study of gecko adhesion
10:00 am		**Coffee Break**	**Exhibit Hall Foyer**
10:30 am	**S12-6**	*Bauer AM; Villanova University*	Gecko Adhesion in Space and Time: A Phylogenetic Perspective on the Scansorial Success Story
11:00 am	**S12-7**	*Heepe L, Gorb SN; Kiel University*	Gecko adhesion or 'gecko effect' adhesion? A case for comparative studies among lizards, spiders, and insects
11:30 am	**S12-8**	*Naylor ER, Higham TE; Univ of California, Riverside*	Attachment Beyond the Adhesive System: Assessing the Contribution of Claws in Gecko Clinging and Locomotion
12:00 pm		**Lunch Break**	
1:30 pm	**S12-9**	*Crosby AJ, Irschick DJ; University of Massachusetts Amherst*	Adhesion Across Size Scales
2:00 pm	**S12-10**	*Arzt E, Hensel R; INM - Leibniz Institute for New Materials*	Micropatterned Bio-Inspired Adhesives - Mechanistic Insight and New Designs

2:30 pm	**S12-11**	*Dhinojwala A, Niewiarowski PH*; University of Akron*	Developing prototypes for testing gecko adhesion on rough surfaces
3:00 pm	**S12-12**	*Russell AP, Gamble T; Univ of Calgary, Marquette Univ*	Dissecting the evolution of the gekkotan adhesive system: one or more origins?
3:30 pm		**Coffee Break**	**Exhibit Hall Foyer**

Monday Program Morning Sessions

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

8:00 AM – 9:45 AM **Session 108** **Room 3 & 4**

Comparative Endocrinology-Differences & Similarities

Chairs: Christian Cox, Melanie Richter

8:00 am	**108-1**	*Wrobel ER, Molina E, Khan NY, Akingbemi BT, Lorenz WW, Mendonca MT, Navara KJ; University of Georgia, Auburn University, University of St. Andrews*	Responsiveness of the chicken germinal disk to testosterone and corticosterone
8:15 am	**108-2**	*Gormally BMG, Estrada R, Yin H, Romero LM; Tufts Univ*	Recovery periods during chronic stress exert complex physiological and behavioral changes in house sparrows
8:30 am	**108-3**	*Khudyakov J, Stephan A, Ngo A, Abdollahi E, Sandhu G, Costa D, Crocker D; Univ of Pacific, Univ of California, Santa Cruz, Sonoma State Univ*	Fat and Fasting: Expression of Obesity-Associated Genes During Fasting in a Naturally Obese Marine Mammal
8:45 am	**108-4**	*Cox CL, Chung AK, Pollock NB, John-Alder HB, Andrew AL, Card DC, Castoe TA, Cox RM; Georgia Southern University, University of Texas Arlington, Rutgers University, University of Virginia*	Evolution of hormonal regulation of sex-biased gene expression
9:00 am	**108-5**	*Bentz AB, Rusch DB, Rosvall KA; Indiana University*	Seasonal Shifts in Neural Gene Expression in a Territorial Female Songbird
9:15 am	**108-6**	*Lipshutz SE, Rosvall KA; Indiana University*	Endocrine mechanisms of aggression in a sex-role reversed species
9:30 am	**108-7**	*Richter MM, Scalf CE, Pullum KB, Cooper LN, Ashley NT; Western Kentucky University*	Effect of Polar Daylight on the Adrenocortical Response to Stress in Arctic-breeding Passerine Birds
9:45 am		**Coffee Break**	**Exhibit Hall Foyer**

8:00 AM – 9:45 AM **Session 109** **Room 5 & 6**

Neuroethology

Chair: Lisa Mangiamele

8:00 am	**109-1**	*Currea JP, Theobald JC; Florida International University*	Regionally Specific Temporal Summation Improves Motion Vision in Small Fruit Flies
8:15 am	**109-2**	*Gall MD, De Koning M, Matthews M, Beatini JR, Proudfoot GA; Vassar College*	Morphological drivers of Northern saw-whet owl directional auditory sensitivity
8:30 am	**109-3**	*Mangiamele LA, Smith SM, Lecure KM, Fuxjager MJ, Preininger D; Smith College, Wake Forest University, Vienna Zoo*	Peripheral androgen action modulates foot flagging, but not vocalizations, in the multimodal display of the frog, *Staurois parvus*
8:45 am	**109-4**	*Stein LR, Sinner M, Iffert RQ, Hoke K; Colorado State University*	Sex on the brain: Effects of reproduction on brain and behavior in Trinidadian guppies
9:00 am	**109-5**	*Hurd PL, Driscoll RMH, Renn SCP; University of Alberta, University of Rochester, Reed College*	Differences in aromatase gene expression and promoter methylation in a cichlid with alternative male morphs.
9:15 am	**109-6**	*Velazquez AM, Paluso JM, Boucher TJ, Brannoch SJ, Svenson GJ, Martin JP*; Colby College, Cleveland Museum of Natural History*	Comparative morphology of motor control in praying mantises

9:30 am	**109-7**	*Skandalis DA, Lunsford ET, Liao JC; University of Florida*	Optogenetic dissection of cholinergic and dopaminergic efferent neuron function in the lateral line system of zebrafish suggests a linear microcircuit model

9:45 am **Coffee Break** **Exhibit Hall Foyer**

8:00 AM – 9:45 AM **Session 110** **Room 13**

Evolution and Stressors

Chair: Teri Orr

8:00 am	**110-1**	*Griffiths JS, Johnson KM, Kelly MW; Louisiana State University*	Evolutionary Change in the Oyster, *Crassostrea virginica*, Following a Low Salinity Event
8:15 am	**110-2**	*Warburton EM, Khokhlova IS, Van Der Mescht L, Downs CJ, Dlugosz EM, Krasnov BR; Ben Gurion University, Hamilton College, University of Tennessee*	Effects of flea infestation on offspring quality in a desert rodent: evidence for parasite-mediated transgenerational phenotypic plasticity
8:30 am	**110-3**	*Wittman TN, Cox RM; University of Virginia*	Testing for fitness costs of parasitism in wild lizards (*Anolis sagrei*) with sustained-release formulations of the anti-parasite drug Ivermectin
8:45 am	**110-4**	*Logan ML; Smithsonian Tropical Research Institute*	Did pathogens facilitate the rise of endothermy?
9:00 am	**110-5**	*Greenberg DA, Palen WJ; Simon Fraser University*	The role of hydration state and temperature on performance and climate susceptibility in amphibians
9:15 am	**110-7**	*Orr TJ, Yamada KY, Shaprio M, Dearing MD; University of Utah, Auburn University*	Diet Switching in mammalian herbivores: differential tolerances of two woodrat species and their hybrids to toxic diets
9:30 am	**110-8**	*Grimes CJ, Schulze A; Texas A&M University at Galveston*	How the sluggish cope with chronic hypoxia: the pointed story of the bearded fireworm, *Hermodice carunculata* (Annelida: Amphinomidae)

9:45 am **Coffee Break** **Exhibit Hall Foyer**

8:00 AM – 9:45 AM **Session 111** **Room 18**

Living & Moving in Groups

Chair: David Murphy

8:00 am	**111-1**	*Jaumann S, Smith A; George Washington University*	Effects of Experience on Brain Development in a Facultatively Social Bee
8:15 am	**111-2**	*Papastamatiou YP, Bodey TW, Bradley D, Friedlander AM, Caselle JE, Freeman R, Jacoby DMP; Florida International University, University of Auckland, University of California Santa Barbara, University of Hawaii/National Geographic, Zoological Society London*	Multiyear social stability shapes cryptic colonial behavior in an ectothermic marine predator
8:30 am	**111-3**	*Chism G, Faron W, Davidowitz G, Dornhaus A; Univ of Arizona, Tucson*	The influence of nest architecture on colony organization in the ant *Temnothorax rugatulus*
8:45 am	**111-4**	*Robart AR, Navarro W, Zuniga H, Watts HE; Washington State University*	Social Pairing Influences Behavior and Physiology Near Termination of Migration in a Facultative Migrant
9:00 am	**111-5**	*Ayali A, Knebel D, Guershon M, Ariel G; Tel Aviv University, Bar Ilan University*	Interactions Between Individual and Group Variance in Collective Behavior
9:15 am	**111-6**	*Burford BP, Williams R, Demetras N, Harding J, Gilly WF; Stanford University, Southwest Fisheries Science Center*	Comparable spatial organization of pelagic fish schools and squid squadrons
9:30 am	**111-7**	*Murphy DW, Olsen D, Kanagawa M, King R, Kawaguchi S, Osborn J, Webster DR, Yen J; Univ of South Florida, Georgia Institute of Technology, Australian Antarctic Division, Univ of Tasmania*	Antarctic Krill Schools: Linking Three Dimensional Structure and Function

9:45 am **Coffee Break** **Exhibit Hall Foyer**

8:15 AM – 9:45 AM **Session 112** **Room 19**

Livin' the Vida Larvae - Larval Ecology

Chair: Kit Yu Karen Chan

8:15 am	**112-1**	*Liu TX, Chan KYK; Hong Kong University of Science and Technology*	Interactive effects of temperature and salinity on early development of Polychaete *Hydroides dirampha*
8:30 am	**112-2**	*Krishnamurthy D, Benoit Du Rey F, Li H, Cambournac P, Korkmazhan E, Prakash M; Stanford University, ISAE-SUPAERO*	Anti-gravity Machine: Multi-scale Imaging and Measurement of Plankton Behavior using a Novel Tracking Microscope
8:45 am	**112-3**	*Podolsky RD; College of Charleston*	Sensitivity of Dynein-ATPase to pH in Sperm of the Sea Urchin *Arbacia punctulata*
9:00 am	**112-4**	*Schatz A, McDowell J, Rivest EB; William & Mary*	Physiological mechanisms of carry-over effects due to environmental salinity experience of *Crassostrea virginica* larvae
9:15 am	**112-5**	*Tong CSD, Chan KYK; Hong Kong University of Science and Technology, Swarthmore College*	Temporal variability modulates pH impact on larval sea urchin development
9:30 am	**112-6**	*Knox CES, Chan KYK*; The Hong Kong University of Science and Technology, Swarthmore College*	Size does matter: Respiratory response of twin urchin embryos to acidification

9:45 am **Coffee Break** **Exhibit Hall Foyer**

8:00 AM – 10:00 AM **Session 113** **Room 20**

Physiology of Feeding and Digestion

Chairs: Donovan German, Alyssa Frederick

8:00 am	**113-1**	*Ali RS, Welch KC; Univ of Toronto*	Plasma membrane (PM) recruitment patterns of glucose transporters (GLUT) 1, 2, 3, and 5 in response to feeding in the ruby-throated hummingbird, *Archilochus colubris*.
8:00 am	**113-2**	*Brun A, Barrett-Wilt GA, Karasov WH, Caviedes-Vidal E*; CONICET-UNSL Argentina, Univ Wisconsin-Madison*	Proteomics of the Enzyme Proteins at the Intestinal Brush Border Membrane of Vertebrates
8:30 am	**113-3**	*Leigh SC, German DP; University of California, Irvine*	The Role of Microbial Symbionts in Bonnethead Shark Seagrass Digestion
8:45 am	**113-4**	*Secor SM, Kay JC, Perry BW, Castoe TA; University of Alabama, University of Texas, Arlington*	The Underlying Mechanisms that Drive Divergent Intestinal Phenotypic Responses to Feeding in Snakes
9:00 am	**113-5**	*German DP, Herrera MJ, Heras J; Univ of California, Irvine*	The meat sweats: the effects of increasing dietary protein content on enteric microbial diversity and digestive and metabolic outcomes in a marine herbivorous fish
9:15 am	**113-6**	*Brun A, Mendez-Aranda D, Magallanes ME, Karasov WH*, Martínez Del Rio C, Baldwin M, Caviedes-Vidal E; Univ of Wisconson-Madison, Max Planck Instit. for Ornithol, Univ San Luis, Univ of Wyoming*	Evolution of intestinal ñ-glucosidases in vertebrates: Genomic and proteomic data upend previous hypotheses
9:30 am	**113-7**	*Frederick AR, Catabay C, Clements KD, German DP; Univ of California, Irvine, Univ of Auckland*	Will abalone survive climate change? Comparative digestive physiology and the effect of temperature stress on abalone across the Pacific Ocean
9:45 am	**113-8**	*James DM, Kozol RK, Kajiwara Y, Wahl AL, Storrs EC, Buxbaum JD, Klein M, Moshiree B, Dallman JE; University of Miami, Icahn School of Medicine at Mount Sinai, University of North Carolina*	A *shank3* Loss-of-Function Model of Autism Spectrum Disease (ASD) Produces Intestinal Dysmotility and Reduced Serotonin Positive Enteroendocrine Cells

10:00 am **Coffee Break** **Exhibit Hall Foyer**

8:00 AM – 9:45 AM **Session 114** **Room 21**

Sexual Selection and Reproductive Behavior

Chair: Toby Daly-Engel

8:00 am	**114-1**	*Yang Y, Richards-Zawacki CL; Univ of Pittsburgh*	Can male contest limit assortative female preference in a polymorphic poison frog?

8:15 am	**114-2**	*Adeola FI, Lailvaux SP; University of New Orleans*	Octopamine mediates mating interactions and sexual conflict in the house cricket (Achaeta domesticus)
8:30 am	**114-3**	*Levell ST, Reznick DN; Univ of California, Riverside*	Can Females Differentially Allocate Resources to Offspring Sired by Different Males?
8:45 am	**114-4**	*Greenway G, Hamel J, Miller CW; Univ of Florida, Elon University*	A Tangled Web: Why do Some Individuals Mate with the Wrong Species?
9:00 am	**114-5**	*Daly-Engel TS, Lytle DA, Wheeler DE, Smith RL; Florida Institute of Technology, Oregon State University, Corvallis, University of Arizona, Tucson*	Sexual Selection on Competitive Females Drives the Evolution of Male Parental Care in the Giant Water Bug, *Abedus herberti* (Hemiptera: Belostomatidae)
9:15 am	**114-6**	*Wilner D, Greenway EV, Cirino LA, Miller CW; Univ of Florida*	Environmental Effects on Behavior and Fitness: The Impact of Temporary Nutritional Deprivation on Future Reproduction in the Leaf-footed Cactus Bug (*Narnia femorata*)
9:30 am	**114-7**	*Lough-Stevens M, Urness M, Hobbs A, Ghione C, Dean M; University of Southern California*	Copulatory plugs potentially affect multiple stages of pregnancy

9:45 am ..... **Coffee Break** ..... **Exhibit Hall Foyer**

8:00 AM – 9:30 AM **Session 115** **Room 22**

Dolphin vs. Tuna

Chairs: Ruijie Zhu, William Gough

8:00 am	**115-1**	*Wang J, Tran H, Christino M, White CH, Zhu J, Wainwright DK, Lauder GV, Bart-Smith H, Dong H; University of Virginia, T.C. Williams High School, Harvard University*	Understanding Thunniform Swimming: Kinematics and Hydrodynamics
8:15 am	**115-2**	*Zhu R, Wang J, Dong H, Bart-Smith H; Univ of Virginia*	Computational Study of Tuna-Shaped Panel with Simultaneously Heaving and Bending Motion
8:30 am	**115-3**	*Zhu JJ, White CH*, Wainwright DK, Di Santo V, Lauder GV, Bart-Smith H; Univ of Virginia, Harvard Univ*	Design and Performance of a High Speed Thunniform Swimming Platform
8:45 am	**115-4**	*Adams DS, Zhu R, Fish FE; West Chester Univeristy, University of Virginia*	Properties and Functions of Tendons in the Peduncle of Odontocetes
9:00 am	**115-5**	*Zhang D, Gabaldon J, Rocho-Levine J, Van Der Hoop J, Moore M, Shorter K; University of Michigan, Dolphin Quest, Oahu, Arhus University, Woods Hole Oceanographic Institution*	Investigating bottlenose dolphin swimming biomechanics using biologging tags, tracking data, sensor fusion and estimation
9:15 am	**115-6**	*Gough WT, Segre PS, Cade DE, Fish FE, Kennedy JH, Sienkiewicz R, Potvin J, Goldbogen JA; Stanford University, West Chester University, Saint Louis University*	Comparative Kinematics and Hydrodynamics of Mysticete Cetaceans: Morphological and Ecological Correlates with Swimming Performance

9:30 am ..... **Coffee Break** ..... **Exhibit Hall Foyer**

8:00 AM – 9:30 AM **Session 116** **Room 23**

Dig Deep

Chairs: Philip Bergmann, Lexi Moore Crisp

8:00 am	**116-1**	*Borela R, Frost JD; Georgia Institute of Technology*	Geomechanics of earthworm locomotion: understanding how the soil enables annelid self-propelled motion
8:15 am	**116-2**	*Yamamoto KY, Vangla P, Frost JD; Georgia Institute of Technology*	2D and 3D laboratory studies to understand tunneling behavior of *Pogonomyrmex occidentalis* in different soil conditions
8:30 am	**116-3**	*Struble MK, Donatelli C, Standen E, Gibb A; Northern Arizona University, Tufts University, University of Ottawa*	Burial Behavior in Elongate Fishes of the Salish Sea
8:45 am	**116-4**	*Keeffe RM, Blackburn DC; University of Florida, Gainesville*	Comparative Morphology of the Forelimb and Pectoral Girdle in Forward-burrowing Frogs
9:00 am	**116-5**	*Bergmann PJ, Berry D; Clark University*	Effects of head shape on granular substrate penetration performance in fossorial lizards

9:15 am	**116-6**	*Moore Crisp AL, Lee DV; Stockton University, University of Nevada, Las Vegas*	Who digs, who hops, who tells your story?

9:30 am **Coffee Break** **Exhibit Hall Foyer**

8:15 AM – 9:30 AM **Session 117** **Room 24**

You Should Chew Your Food

Chair: Mark Westneat

8:15 am	**117-2**	*Schwarz D, Heiss E, Konow N; Friedrich-Schiller-University Jena, University of Massachusetts Lowell*	Three-dimensional mandibular movements during chewing in a salamander
8:30 am	**117-3**	*Heiss E, Schwarz D, Konow N; Friedrich-Schiller-University of Jena, University of Massachusetts Lowell*	Flexibility of intraoral food processing in newts
8:45 am	**117-4**	*Gripshover ND, Jayne BC; Univ of Cincinnati*	Testing How Gape and Prey Size Affect Feeding Performance in a Crayfish-eating Snake
9:00 am	**117-5**	*Garcia PA, Deban SM, Jones MEH, Lappin AK; California State Polytechnic Univ, Pomona, Univ South Florida, Natural History Museum, London*	Effects of Bite Out-Lever and Gape Angle on Bite-Force Performance in the Brown Anole (*Anolis sagrei*)
9:15 am	**117-6**	*Westneat MW; University of Chicago*	Mapping Anatomical Structure to Biomechanical Function in Musculoskeletal Lever and Linkage Systems

9:30 am **Coffee Break** **Exhibit Hall Foyer**

8:00 AM – 10:00 AM **Session 133** **Room 25**

Immune Trade-Offs

Chairs: Michael Butler, Franziska Sandmeier

8:00 am	**133-1**	*Wilcoxen TE, Weber R, Zimmerman LM; Millikin University*	Effects of Elevated Corticosterone on Immune Response to *Aeromonas hydrophila* in Northern Leopard Frog Tadpoles
8:15 am	**133-2**	*Butler MW, Stierhoff EN, Carpenetti JM, Addesso AM, Knutie SA; Lafayette College, University of Connecticut*	Oxidative damage increases with degree of simulated bacterial infection in tree swallow nestlings
8:30 am	**133-3**	*Sandmeier FC, Leonard KL, Tracy CR, Drake KK, Esque T, Nussear K, Germano J; Colorado State University-Pueblo, University of Nevada, Reno, US Geological Survey, Department of Conservation, New Zealand*	Tools to understand seasonality in health: quantification of microbe loads and analyses of compositional ecoimmunological data reveal complex patterns in tortoise populations
8:45 am	**133-4**	*Gardner S, Assis VR, Appel A, Mendonça MT; Auburn University, University of Sao Paulo*	Immunity vs dispersal of Florida cane toads: physiological responses to LPS
9:00 am	**133-5**	*Hawkins TM, Marshall AS, Short RA, Wolford AM, Davis JE; Radford University*	Effects of Royal Jelly and Juvenile Hormone on Growth and Immunity in *Gromphadorhina portentosa* and *Drosophila melanogaster*
9:15 am	**133-6**	*Ricci CA, Fuess LE, Mann WT, Chakrabarty J, Jinks LR, Mydlarz LD; University of Texas at Arlington*	Proteomic Characterization of Immune Responses and Post-infection Dynamics of *Eunicea calyculata* to late stage *Eunicea* Black Disease
9:30 am	**133-7**	*Tapper SJ, Nocera J, Tattersall G, Burness G; Trent University, University of New Brunswick, Brock University*	Body temperature regulation during the acute phase response in zebra finches
9:45 am	**133-8**	*Simpson JS, Lenker KL, Wilson CA, Ejotre I, Kurpiers L, Reeder D, Field KA; Bucknell University*	Using transcriptomics to identify patterns of gene expression associated with disease transmission in African fruit bats *(Epomophorus labiatus)*

10:00 am **Coffee Break** **Exhibit Hall Foyer**

10:15 AM – 12:00 PM **Session 120** **Room 3 & 4**

Environmental Endocrinology: Animals Dealing with a Messed Up World

Chairs: Isaac Ligocki, Allison Injaian

10:15 am	**120-1**	*Hale MD, McCoy JA, Doheny BM, Galligan TM, Guillette LJ, Parrott BB; University of Georgia, College of Charleston, University of Minnesota, Virginia Tech, Medical University of South Carolina*	Embryonic Origins of Altered Ovarian Transcriptional Networks in an Environmental Model of Endocrine Disruption, the American Alligator
10:30 am	**120-2**	*Mass S, Funk A, Pinsky B, Massena K, Chabria T, Minicozzi M, Mlynarska I, Moody T, St John P; SUNY New Paltz, Univ of Northern Arizona*	Endocrine disruption, cytoskeleton and regeneration in planaria
10:45 am	**120-3**	*Mackay SB, Trainor CP, Wilson KL, Bergman DA; Grand Valley State University*	Chronic Effects of an Environmental Contaminant on Reproductive Behavior and Physiology
11:00 am	**120-4**	*Minicozzi M, Von Hippel FA, Furin C, Buck CL; Northern Arizona University, University of Alaska Anchorage*	Sodium Perchlorate Induces Non-Alcoholic Fatty Liver Disease in the Developing Stickleback Liver
11:15 am	**120-5**	*Injaian AS, Taff CC, Pearson KL, Gin MMY, Patricelli GL, Vitousek MN; Cornell University, University of California, Davis*	Effects of experimental chronic traffic noise exposure on adult and nestling corticosterone levels, and nestling body condition in a free-living bird
11:30 am	**120-6**	*De Bruijn R, Gilmour KM, Hinch SG, Patterson DA, Cooke SJ; Carleton University, Univ of Ottawa, Univ of British Columbia, Fisheries and Oceans Canada*	Bile: an alternative matrix to assess stress status in migrating and spawning salmonids?
11:45 am	**120-7**	*Ligocki IY, Munson A, Farrar V, Viernes RV, Sih A, Connon RE, Calisi RM; University of California, Davis*	The behavioral and transcriptional impacts of bifenthrin exposure in a widely introduced model fish.

12:00 pm **Lunch Break**

10:00 AM – 11:45 AM **Session 121** **Room 5 & 6**

Evolutionary Thermal Biology

Chairs: Martha Muñoz, Jeffrey Lozier

10:00 am	**121-1**	*Salinas S, Golden SQ, Schertzing CL, Irvine SE, Munch SB; Kalamazoo College, National Marine Fisheries Service*	Variation at Extreme Thermal Environments Under Constant and Fluctuating Temperatures
10:15 am	**121-2**	*Neel L, Logan M, Losos J, McMillan O, Cox C, Angilletta M; Arizona State, Smithsonian Tropical Research Institute, Washington Univ, Georgia Southern*	Environmental heterogeneity, thermoregulatory strategy, and the effects of climate change on ectotherms across latitude
10:30 am	**121-3**	*Mikucki EE, Lockwood BL; University of Vermont*	Winter warming threatens cold tolerance and survival in diapausing *Pieris rapae* butterflies
10:45 am	**121-4**	*Spranger RS, Sinervo B; Univ of California, Santa Cruz*	Thermal Acclimation Potential of *Ambystoma* and *Dicamptodon* Salamanders
11:00 am	**121-5**	*Blaimont P, Dupoué A, Miles DB, Clobert J, Sinervo B; Univ of California, Santa Cruz, CNRS, Ohio University*	Effects of basking opportunity on gestation and offspring phenotype of the common lizard (*Zootoca vivipara*)
11:15 am	**121-6**	*Lozier JD, Pimsler ML, Oyen KJ, Jackson JM, Herndon JD, Dillon ME, Strange JP; University of Alabama, University of Wyoming, Utah State University*	Biogeography and functional genetics of thermal tolerance across latitude and elevation in a widespread bumble bee
11:30 am	**121-7**	*Muñoz MM, Salazar JC, Londono GA, Castaneda MR; Virginia Tech, ICESI*	A test of the island effect in the physiological evolution of anoles.

11:45 am **Lunch Break**

10:30 AM – 11:45 AM **Session 122** **Room 13**

Evolution and Coloration

Chairs: Charles Watson, Amanda Hund

10:30 am	**122-1**	*Hodge JR, Santini F, Wainwright PC; Univ of California, Davis*	One Fish, Two Fish, Reef Fish, Blue Fish: Dichromatism in Fishes as an Adaptation to Life on Coral Reefs

10:45 am	**122-2**	*Watson CM, Degon Z, Krogman W, Cox CL; Midwestern State University, Georgia Southern University, Noble Research Institute*	The adaptive significance of an ontogenetic shift in coloration among skinks.
11:00 am	**122-3**	*Karan EA, Alfaro ME; Univ of California, Los Angeles*	Evolution of False Eyespots in Butterflyfishes: Testing Eye Camouflage and Mimicry as Anti-predator Adaptations
11:15 am	**122-4**	*Hund AK, Turbek SP, Pauli CS, Safran RJ, Taylor SA; University of Minnesota, University of Colorado*	Early Environment and Condition Dependence in a Lifelong Sexual Signal: Gene Expression and Melanin Color in Barn Swallows.
11:30 am	**122-5**	*Judson JM, Hoekstra L, Holden K, Polich R, Adams C, Bronikowski A, Janzen F; Iowa State University*	The role of color, immunity, and sexually dimorphic traits in female mate choice
11:45 pm		**Lunch Break**	

10:30 AM – 12:00 PM **Session 123** **Room 18**

You Are What You Eat - Bioindicators

Chair: Jackson Johnstone

10:30 am	**123-1**	*Thompson WA, Subbiah S, Cleary R, Lasee S, Karnjanapiboonwong A, Anderson TA; University of Georgia, Texas Tech University*	Chronic Toxicity of Perfluoroheptanoic acid (PFHpA) and Perfluorooctanoic acid (PFOA) to Northern Bobwhite
10:45 am	**123-2**	*Weighman KK, Moore PA; Bowling Green State Univ, Univ of Michigan Biological Station*	Modeling Dynamic Exposure in Flow
11:00 am	**123-3**	*Steele AN, Moore PA; Bowling Green St. Univ, Univ of Michigan*	Defining Exposure: Contribution of Exposure Paradigm Characteristics to Impairment of Aquatic Organisms
11:15 am	**123-4**	*Mitchell TS, Shephard AM, Snell-Rood EC; University of Minnesota*	Delicious Ditches: Do Butterflies Prefer Sodium-Enriched Host-Plants Typical of Salted Roadsides?
11:30 am	**123-5**	*Wilson RS, Amir Abdul Nasir AF, Cameron S, Von Hippel F; University of Queensland, Northern Arizona University*	Manganese contamination affects the motor performance of wild northern quolls
11:45 am	**123-6**	*Johnstone JB, Rahman MDS; University of Texas Rio Grande Valley*	Impacts of rising temperatures on gonadal functions, heat shock protein expression, and cellular apoptosis in Atlantic sea urchin
12:00 pm		**Lunch Break**	

10:15 AM – 11:45 AM **Session 124** **Room 19**

Finding the Way, Finding Home

Chair: Guy Levy

10:15 am	**124-1**	*Levy G, Trimmer BA; Tufts University*	Realtime, 3-D Acquisition and Analysis of Caterpillar Locomotion
10:30 am	**124-2**	*Flanigan KAS, Wiegmann DD, Bingman VP; Bowling Green State University*	Tactile cues facilitate shelter discrimination in Amblypygi (Arthropoda: Arachnida)
10:45 am	**124-3**	*Moore ME, Wiegmann DD, Bingman VP; Bowling Green State University*	Shelter Fidelity and Homing Mechanisms in *Phrynus pseudoparvulus (Whip Spiders)*
11:00 am	**124-4**	*Casto P, Bingman VP, Hebets EA, Wiegmann DD; Bowling Green State University, University of Nebraska*	Evidence for the Distal-Allocentric Representation of Refuge Location in Whip Spiders (Arachnida: Amblypygi)
11:15 am	**124-5**	*Kamran M, Pollock AMM, Dittman AH, Noakes DLG; Oregon State University, NOAA*	Use of behavioral assays to select odorants for olfactory imprinting to improve homing in Pacific salmon
11:30 am	**124-6**	*Brodbeck MIR, Bingman VP, Yuan S, MacDougall-Shackleton SA; The University of Western Ontario, Bowling Green State University*	Cluster N Activity in Migrating Nocturnal Birds: Circadian Control or Facultative Regulation?
11:45 am		**Lunch Break**	

10:45 AM – 12:00 PM **Session 125** **Room 20**

Ecological and Evolutionary Consequences of Metabolic Diversity 2

Chair: Eric Riddell

10:45 am	**125-1**	*Horn KM, Liautaud KA, Conrad CL, Telander KJ, Zippay ML, Hardy KM; Cal Poly SLO, Sonoma State Univ*	Are there distinct metabolic phenotypes in common acorn barnacles *Balanus glandula* across the intertidal zone?
11:00 am	**125-3**	*Riddell EA, Iknayan K, Wolf BO, Sinervo B, Beissinger SR; Univ of California, Univ of New Mexico*	Evaporative cooling stress links body mass to the collapse of desert bird communities
11:15 am	**125-4**	*Bigman JS, Prinzing TS*, Wong S, Vanderwal W, Dulvy NK; Simon Fraser University*	Elasmobranch metabolic rate in an ecological and evolutionary context
11:30 am	**125-5**	*Clissold FJ, Woodman JD, Wilson K, Simpson SJ; The University of Sydney, Department of Agriculture and Water Resources, Lancaster University*	The influence of temperature on nutrient supply and demand: host plant quality is temperature dependent
11:45 am	**125-6**	*Le Gall M, Thompson N, Cease AJ; Arizona State University*	Cheating on Atkin's: high-protein diet reduces lifespan in the Senegalese locust, *Oedaleus senegalensis*.

12:00 pm **Lunch Break**

10:15 AM – 11:45 AM **Session 126** **Room 21**

Species and Speciation

Chairs: Sabrina Pankey, Brian Counterman

10:15 am	**126-1**	*Kelly JB; Stony Brook University*	Holobiont species delimitation in the sponge genus *Ircinia*
10:30 am	**126-2**	*Pankey MS, MacArtney KJ, Gastanaldi M, Gochfeld DJ, Slattery M, Plachetzki DC, Lesser MP; University of New Hampshire, Escuela Superior de Ciencias Marinas, University of Mississippi*	Coincident shifts in symbiotic communities underlie convergent host evolution
10:45 am	**126-3**	*Titus BM, Meyer C, Berumen ML, Bartholomew A, Reimer JD, Yanagi K, Rodriguez E; American Museum of Natural History, National Museum of Natural History, King Abdullah Univ of Science and Technology, University of the Ryukyus, Natural History Museum and Institute- Chiba*	Systematics and Species Delimitation of the Clownfish-Hosting Sea Anemones: Are There Really Only 10 Host Species?
11:00 am	**126-4**	*Counterman BA, Fenner JL; Mississippi State University*	Plasticity, hybridization and speciation on the Dogface butterfly wing
11:15 am	**126-5**	*Cole JM, Van Belleghem SM, Counterman BA; Mississippi State University, University of Cambridge*	The influence of demographic history on heterogeneous patterns of genomic divergence in an incipient *Heliconius* species
11:30 am	**126-6**	*Bredlau JP, Kester KM, Gundersen-Rindal DE, Kuhar D; Virginia Commonwealth University, USDA-ARS*	Asymmetric Hybrid Sterility and Bracovirus Differentiation Among Host-foodplant Sources of the Parasitic Wasp, *Cotesia congregata*

11:45 am **Lunch Break**

10:00 AM – 11:45 AM **Session 127** **Room 22**

Squishy Swimmers

Chairs: Margaret Byron, Kakani Katija

10:00 am	**127-1**	*Katija K, Aoki N, Harned A, Mushegian N, Daniels J, Osborn K; Monterey Bay Aquarium Res. Inst., Cornell University, George Washington University, University of California, Smithsonian National Museum of Natural History*	Locomotion in tomopterids: How do these gelatinous, holopelagic worms swim?
10:15 am	**127-2**	*Durieux DM, Du Clos KT, Gemmell BJ; University of South Florida*	Aggregation and Benthic Locomotion in Upside-down Jellyfish: Impacts on Feeding and Defense
10:30 am	**127-3**	*Byron ML, Bail JD, McHenry MJ; Penn State University, University of California Irvine*	Space utilization and orientation of cydippid ctenophores in simple shear and turbulence

10:45 am	**127-4**	*Xu NW, Dabiri JO; Stanford University*	Stimulation of latent enhanced propulsion in free-swimming jellyfish
11:00 am	**127-5**	*Hoover AP, Miller LA; University of Akron, University of North Carlonia*	The Emergence of Neuromechanical Resonance in the Control of Jellyfish Locomotion
11:15 am	**127-6**	*Gemmell BJ, Colin SP, Costello JH, Sutherland KR; University of South Florida, Roger Williams University, Providence College, University of Oregon*	Bouncing off the (non-existent) walls: Using the vortex rebound phenomenon to outswim your peers
11:30 am	**127-7**	*Li DH, Bartol IK, Gilly WF; Stanford University, Old Dominion University*	Hydrodynamic diversity in squid jets mediated by giant and non-giant axon systems
11:45 am		**Lunch Break**	

10:00 AM – 11:30 AM **Session 128** **Room 23**

Slippery Slope

Chairs: Glenna Clifton, Diana Mantilla

10:00 am	**128-1**	*Clifton GT, Holway D, Gravish N; Univ of California, San Diego*	Large-scale, Automated Tracking of Ant Walking Reveals Kinematic Mechanisms Underlying Speed Constraints on Uneven Ground
10:15 am	**128-2**	*Mantilla DC, Tucker EL, Hsieh ST; Temple Univ*	Kinematics of Specialist and Generalist Lizards Running on Level and Incline Granular Media
10:30 am	**128-3**	*Arias AA, Azizi E; University of California, Irvine*	Limb joint mechanics during incline and decline locomotion in *Alligator mississippiensis*
10:45 am	**128-4**	*Dunham NT, McNamara A, Hieronymus TL, Shapiro L, Young JW; NEOMED, University of Texas at Austin*	Locomotor kinematics of free-ranging primates in response to changes in substrate diameter and orientation
11:00 am	**128-5**	*Pravin S, Han E, Jaeger H, Hsieh ST; Temple University, The University of Chicago*	Toe Spacing Induces Particle Jamming During Intrusion Into Granular Media
11:15 am	**128-6**	*Rieser JM, Astley HC, Gong C, Chong B, Schiebel PE, Rankin JW, Michel K, Nicieza A, Hutchinson JR, Hatton RL, Choset H, Goldman DI; Ga Tech, Univ Akron, Carnegie Mellon, Royal Vet College, Univ Oviedo, Oregon State*	Comparative geometric mechanics of animal locomotion in dissipative environments
11:30 am		**Lunch Break**	

10:00 AM – 11:30 AM **Session 129** **Room 24**

Up the Flow and Down the Hatch

Chairs: Pauline Provini, Sarah Kienle

10:00 am	**129-1**	*Jimenez YE, Brainerd EL; Brown University*	Dual Function of the Epaxial Musculature of Largemouth Bass for Swimming and Suction Feeding
10:15 am	**129-2**	*Provini P, Brunet A, Van Wassenbergh S; Muséum National d'Histoire Naturelle*	Intra-Oral Hydrodynamics of Suction Feeding in Fishes
10:30 am	**129-3**	*Weller HI, Manafzadeh A, Olsen AM, Hernandez LP, Camp AL, Brainerd EB; Brown University, George Washington University, University of Liverpool*	An XROMM Study of Intra-oral Transport and Swallowing in Catfish
10:45 am	**129-4**	*Van Wassenbergh S; Muséum National D'Histoire Naturelle*	Three-dimensional patterns of water flow in a cross-step model of a filter feeding fish
11:00 am	**129-5**	*Jacobs C, Day S, Holzman R; Tel Aviv University, Rochester Institute of Technology*	The Power of Pivot Feeding: A Neglected Role For Power Amplification in Syngnathidae.
11:15 am	**129-6**	*Kienle SS, Cacanindin A, Costa DP, Mehta RS; Univ of California Santa Cruz*	Hawaiian Monk Seals Suck: Behavioral Flexibility in Feeding Strategies and Kinematics When Hawaiian Monk Seals Target Different Prey
11:30 am		**Lunch Break**	

Monday Program Afternoon Sessions

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

1:30 PM – 3:00 PM **Session 132** **Room 3 & 4**

Dynamics of Predator-Prey Interactions

Chair: Ashley Peterson

1:30 pm	**132-1**	*Wrensford KC, Gutierez JA, Cooper WE, Blumstein DT; Univ of California, Berkeley, Univ of California, Los Angeles, Purdue University Fort Wayne*	. Does interpath angle Influence escape behavior: An empirical test with yellow bellied marmots.
1:45 pm	**132-2**	*Hoch JM, Spadafore S, Cabanelas A; Nova Southeastern University*	Fish Personality Variation Affects Migration and Dispersal in the Dynamic Wetlands of the Everglades
2:00 pm	**132-3**	*Austin MD, Feldmann S, Dunlap AS; Univ of Missouri, St. Louis*	Are Smart Flies Off the Menu? The Effect of Evolved Learning Ability on Survival Under Predation
2:15 pm	**132-4**	*Watkins MJ, Brown HM, Rubega MA; University of Connecticut*	Hiding in Plain Sight: Do Brown Trout Background Match in Simple Environments?
2:30 pm	**132-5**	*Prakash M, Coyle SM*, Flaum E, Li H, Krishnamurthy D; Stanford University*	Coupled Active Systems Encode Emergent Behavioral Dynamics of the Unicellular Predator Lacrymaria olor
2:45 pm	**132-6**	*Schraft H, Bakken G, Clark R; San Diego State University, University of California Davis*	Infrared-sensing snakes select ambush orientation based on thermal backgrounds

1:30 PM – 3:30 PM **Session 134** **Room 13**

Evolutionary Ecology

Chairs: Iris Levin, Amelie Fargevieille

1:30 pm	**134-1**	*Hantak MM, Kuchta SR; Ohio University*	Spatial Variation in Ecological Divergence in a Widespread Polymorphic Salamander
1:45 pm	**134-2**	*Nicholson DJ, Logan ML, Cox C, Chung A, Degon Z, Dubois M, Neel L, Curlis JD, McMillan WO, Garner T, Knell RJ; Queen Mary University London, Smithsonian Tropical Research Institute, Georgia Southern University, Northeastern Univeristy, Arizona State University, Zoological Society of London*	Natural Selection on Morphology in a Tropical Lizard After a Rapid Shift in Habitat Structure
2:00 pm	**134-3**	*Fargevieille A, Reedy AM, Mitchell TS, Durso AM, Delaney DM, Pearson PR, Warner DA; Auburn University, University of Virginia, University of Alabama, Utah State University, Iowa State University*	Population Demographics of an Invasive Lizard Following Experimental Introduction on Small Islands
2:15 pm	**134-4**	*Levin II, Hund AK, Ibrahim AI, Stephens JQ, Wicker VV, Tsunekage T, McCahill K, Safran RJ; Agnes Scott College, University of Colorado - Boulder*	Heritability of telomere length in nestling barn swallows (*Hirundo rustica erythrogaster*)
2:30 pm	**134-5**	*Assis BA, Avery JD, Tylan C, Earley RL, Langkilde T; Penn State, University of Alabama*	Inheritance, Hormonal Drivers and Fitness Implications of Female Ornamentation in Fence Lizards
2:45 pm	**134-6**	*Herrera MJ, German DP; Univ of California, Irvine*	Digestive performance and microbiome changes in response to dietary shifts in closely-related prickleback fishes (Family Stichaeidae) with different natural diets.
3:00 pm	**134-7**	*Cespedes AM, Houslay TM, Lailvaux SP; University of New Orleans, University of Cambridge*	Individual-level performance trade-offs in male and female *Anolis carolinensis* lizards
3:15 pm	**134-8**	*Heyduk K, Ray JN, Cummings A, Leebens-Mack J; Yale University, University of Georgia*	Variation in the ability to use CAM in a *C3-CAM hybrid Yucca*

1:30 PM – 3:15 PM **Session 136** **Room 19**

Complementary to S7: Comparative Evolutionary Morphology and Biomechanics in the Era of Big Data

Chairs: Anne-Claire Fabre, Ryan Felice

1:30 pm	**136-1**	*Kahrl AF, Snook RR, Fitzpatrick JL; Stockholm University*	Sperm Evolution Across the Animal Tree of Life
1:45 pm	**136-2**	*Paluh DJ, Coloma LA, Blackburn DC; University of Florida, Centro Jambatu de Investigación y Conservación de Anfibios, Florida Museum of Natural History*	Evolutionary Lability in Life History, Morphology, and Performance in Andean Marsupial Frogs
2:00 pm	**136-3**	*Fabre AC, Bardua C, Bonnel J, Blackburn D, Goswami A; NHM, London, Univ of Florida*	Morphological Integration of the Head in Salamanders: Impact of Developmental Strategy and Ecology.
2:15 pm	**136-5**	*Watanabe A, Felice RN, Maisano JA, Müller J, Herrel A, Goswami A; NY Institute of Technology, University College London, University of Texas, Museum für Naturkunde, Muséum National d'Histoire Naturelle, Natural History Museum*	First Squamate-Wide Phenomic Analysis Reveals Conserved Pattern of Cranial Integration Underlying Mosaic Skull Shape Evolution
2:30 pm	**136-6**	*Rader JA, Hedrick TL; UNC Chapel Hill*	Aerodynamics, not load, predicts avian wing thickness
2:45 pm	**136-7**	*Larouche O, Friedman ST, Wainwright PC, Price SA; Clemson University, University of California, Davis*	Do marine and freshwater fishes differ in rates and directions of body shape evolution?
3:00 pm	**136-8**	*Friedman ST, Wainwright PC; Univ of California, Davis*	Getting to the bottom of it: Morphological diversification in benthic teleosts

1:30 PM – 3:15 PM **Session 137** **Room 21**

Character Development and Evolution

Chairs: Jeanne Serb, Eric Erkenbrack

1:30 pm	**137-1**	*Spillane JL, Lesser MM, MacManes MD, Plachetzki DC; University of New Hampshire*	Sponges: Degenerate Form or Ancestral State?
1:45 pm	**137-2**	*Erkenbrack EM, Thompson JR; Yale University, University of Southern California*	To be or not to be homologous: Evolution of cell type identity of the echinoderm larval skeletogenic cell
2:00 pm	**137-3**	*Stewart JR, Mendez De La Cruz FR; East Tennessee State Univ, Universidad Nacional Autonoma de Mexico*	Novel Placental Structure in the Mexican Lizard, *Mesaspis viridiflava*.
2:15 pm	**137-4**	*Kallal RJ, Moore AJ, Hormiga G; The George Washington University, Stony Brook University*	The Shape of Weaver: The Evolution of Carapace Shape Disparity in Orb-Weaving Spiders (Arachnida: Araneae: Araneidae)
2:30 pm	**137-5**	*Bonilla MM, Shubin NH; University of Chicago*	How is the endoderm regionalized in chondrichthyans?
2:45 pm	**137-6**	*Serb JM, Smedley GD, Audino JA; Iowa State Univ, Univ São Paulo*	Evolution of morphologically complex eyes in the Pectinoidea (Mollusca: Bivalvia)
3:00 pm	**137-7**	*Newhouse DJ, Gonser RA, Balakrishnan CN; East Carolina University, Indiana State University*	Impacts of parental genotypes on nestling gene expression

1:30 PM – 3:30 PM **Session 138** **Room 22**

Bird Flight

Chair: Diana Chin

1:30 pm	**138-1**	*Deetjen ME, Chin DD, Tobalske BW, Lentink D; Stanford University, University of Montana*	Muscles, 3D Wing Shape, and Aerodynamic Forces in Bird Flight
1:45 pm	**138-2**	*Pagès F, Fabre AC, Herrel A, Abourachid A; Muséum National d'Histoire Naturelle, Paris, National History Museum*	Morpho-functional trade-off between physiology and flying ability in birds
2:00 pm	**138-3**	*Baliga VB, Szabo I, Altshuler DL; University of British Columbia*	Range of motion in the avian wing reflects evolutionary specialization for different flight behaviors
2:15 pm	**138-4**	*Tanaka H, Kawahara A, Aizawa M, Yamasaki T; Tokyo Institute of Technology, Yamashina Institute for Ornithology*	Measurement of Flexural Stiffness of Hummingbirds' Feathers and Its Aerodynamic Effect in Hovering

2:30 pm	**138-5**	*Williamson CJ, Spelt A, Windsor SP; University of Bristol*	Energy Saving Flight Strategies of Urban Gulls
2:45 pm	**138-6**	*Rogalla S, Shawkey MD, D'Alba L; Ghent University*	Dark or Bright for a Faster Flight? The Thermal Impacts of Wing Coloration on Flight Performance
3:00 pm	**138-7**	*Chin DD, Lentink D; Stanford University*	Avian locomotion strategies during arboreal foraging
3:15 pm	**138-8**	*Durston NE, Windsor SP; University of Bristol*	Quantifying the flight stability of free-gliding birds of prey

1:30 PM – 3:15 PM **Session 139** **Room 23**

Flow through Tight Spaces

Chair: Anthony Moss

1:30 pm	**139-1**	*Feng J, Chomicki G, King H; University of Akron, Oxford University*	Wind-powered Cooling in Specialized Fijian Ant-plant
1:45 pm	**139-2**	*Yaeger JM, Amthor AE, Luna M, Noel AC, Nadler JH; Georgia Tech Research Institute*	Passive Fluid Transport Properties and Biomimetic Potential of Aerial Orchid Roots
2:00 pm	**139-3**	*Moss AG, Madin LP; Auburn University, Woods Hole Oceanographic Institution*	The ciliated groove of salps: A new perspective
2:15 pm	**139-4**	*Kornev K, Zhang C, Sande L, Pometto S, Beard C, Adler P; Clemson University*	Self-Assembly and Repair of the Butterfly Proboscis: the Role of Capillary Forces
2:30 pm	**139-5**	*Miller LA, Battista N, Ozalp K; University of North Carolina, College of New Jersey*	Fluid transport and mixing in tubular insect hearts
2:45 pm	**139-6**	*Peters JM, Mahadevan L; Harvard University*	Distributed control of ventilation by honeybee-inspired robots
3:00 pm	**139-7**	*Farmer CG, Cieri RL, Pei S; University of Utah, Trinity College Dublin*	A Tesla Valve in a Turtle Lung

1:30 PM – 3:00 PM **Session 140** **Room 24**

Flying through Water and Swimming on Land

Chair: Kristen Crandell

1:30 pm	**140-1**	*Crawford CH, Randall ZS, Hart PB, Page LM, Chakrabarty P, Flammang BE; New Jersey Institute of Technology, Florida Museum of Natural History, Louisiana State University*	The Muscles That Move The Fishes That Walk
1:45 pm	**140-2**	*Petersen JC, Ramsay JB; Westfield State University*	Walking on Chains: Anatomy and Functional Morphology of the Walking Appendages in Sea-Robins
2:00 pm	**140-3**	*Vega CM, Chadwell B, Ashley-Ross MA; Wake Forest University, Idaho College of Osteopathic Medicine*	Turtling the salamander: the role of lateral undulation in sprawling locomotion
2:15 pm	**140-4**	*Crandell KE, Howe RO, Cannon C, Falkingham PL; Bangor University, Liverpool John Moores University*	A comparative analysis of the hydrodynamics of beak shape kingfishers
2:30 pm	**140-5**	*Kikuchi DM, Maeda M, Shiomi K, Tanaka H; Tokyo Institute of Technology, Royal Veterinary College Univ of London, National Institute of Polar Research*	Fluid dynamics function of the rhinoceros auklets' horn in flying and swimming
2:45 pm	**140-7**	*Oura T, Maeda M, Tanaka H; Tokyo Institute of Technology, Royal Veterinary College*	Three-dimensional wing motions of a diving penguin

1:30 PM – 3:00 PM **Session 141** **Room 18**

Evolution of Behavior

Chair: Callin Switzer

1:30 pm	**141-1**	*Emberts Z, St. Mary CM, Forthman M, Miller CW; University of Florida*	The Evolution of Sacrificing a Limb (i.e., Autotomizing) to Escape Predation
1:45 pm	**141-2**	*St. John ME, Martin CH; Univ of North Carolina, Chapel Hill*	The cascading effects of aggression on trophic innovation and reproductive isolation within an adaptive radiation of pupfishes

2:00 pm	**141-3**	*Switzer CM, Daniel TL; Univ of Washington*	Fear of Missing Out (FOMO): How bees weigh exploration vs. exploitation of pollen sources
2:15 pm	**141-4**	*Lane ZM, Zardus JD, McElroy EJ, Kendrick MR, Morton SL; College of Charleston, The Citadel, SCDNR, NOAA*	Working Smart not Hard: Loss of Active Feeding Behavior in the Commensal Sea Turtle Barnacle, *Chelonibia testudinaria*
2:30 pm	**141-5**	*Devitz AC, Rubi TL, Dantzer B; University of Michigan*	Behavior and diet of white-footed mice along an ecological range expansion
2:45 pm	**141-7**	*Song H; Texas A&M University*	The making of a locust: a closer look at reaction norm evolution

3:45 PM – 4:45 PM	**MOORE Lecture**	**Room 14-17**
Moore Lecture	*Padian K; UC Berkeley*	Lessons from the “Intelligent Design” Trial: Explaining Evolution and Climate Science in a “Post-Evidentiary World”

Keyword Index

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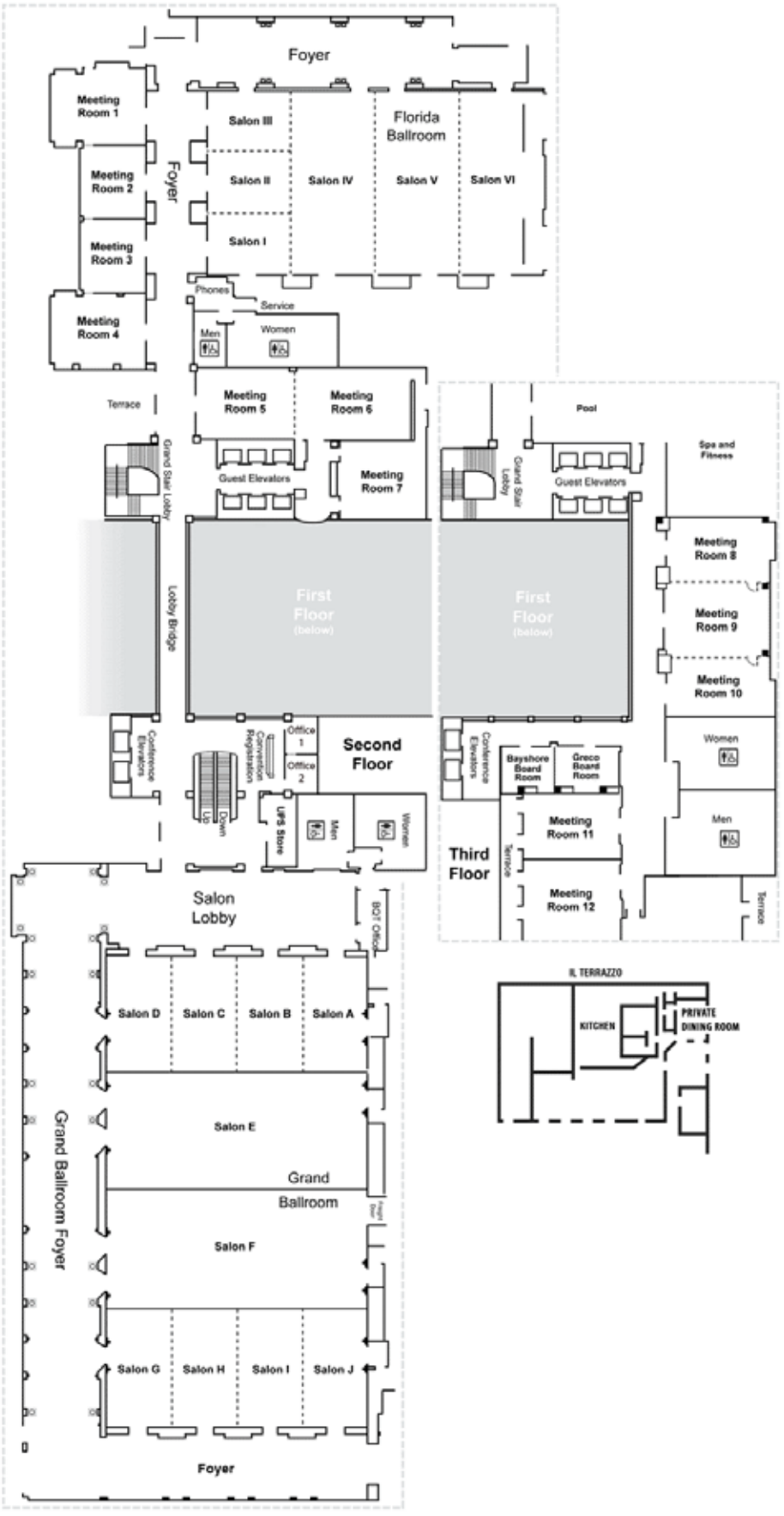

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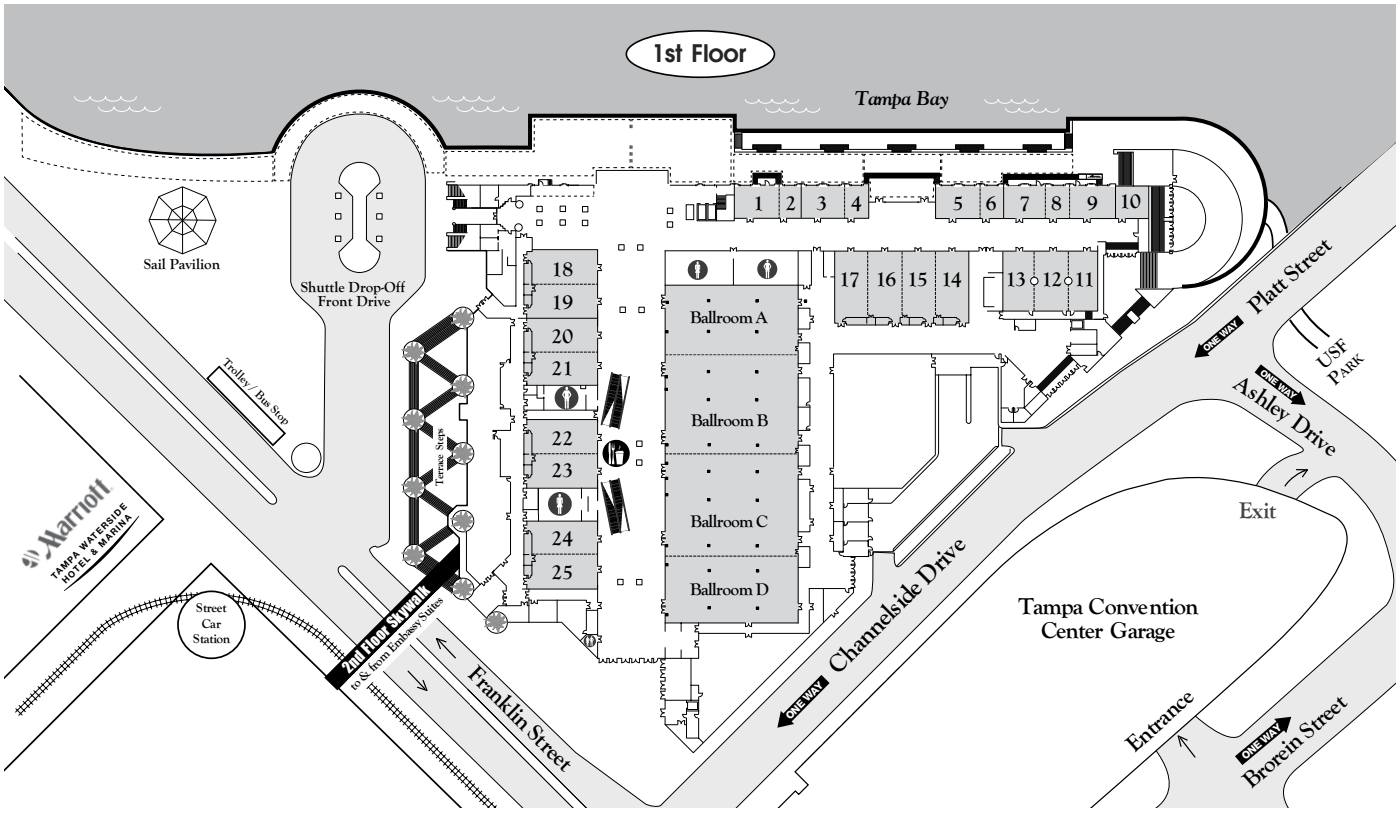

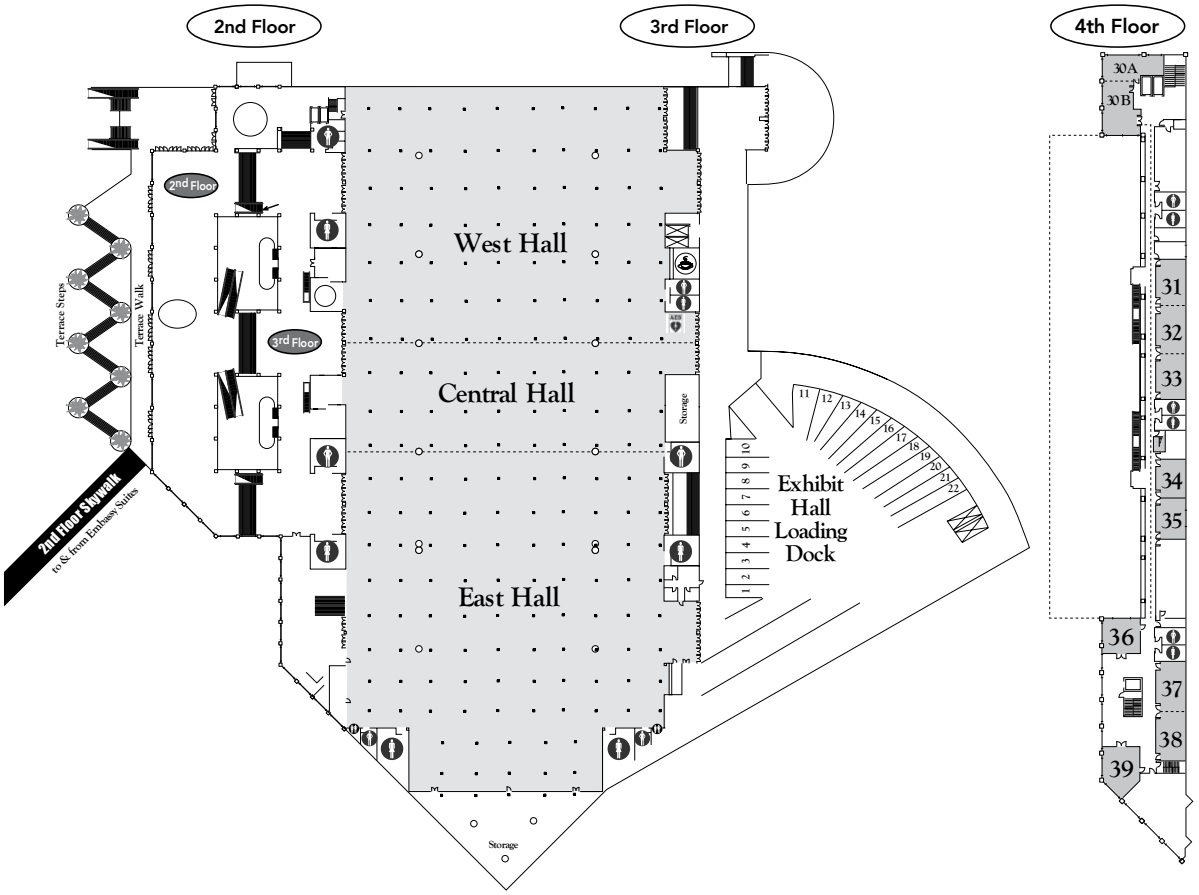

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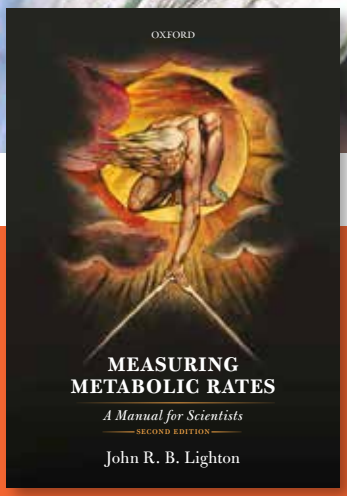

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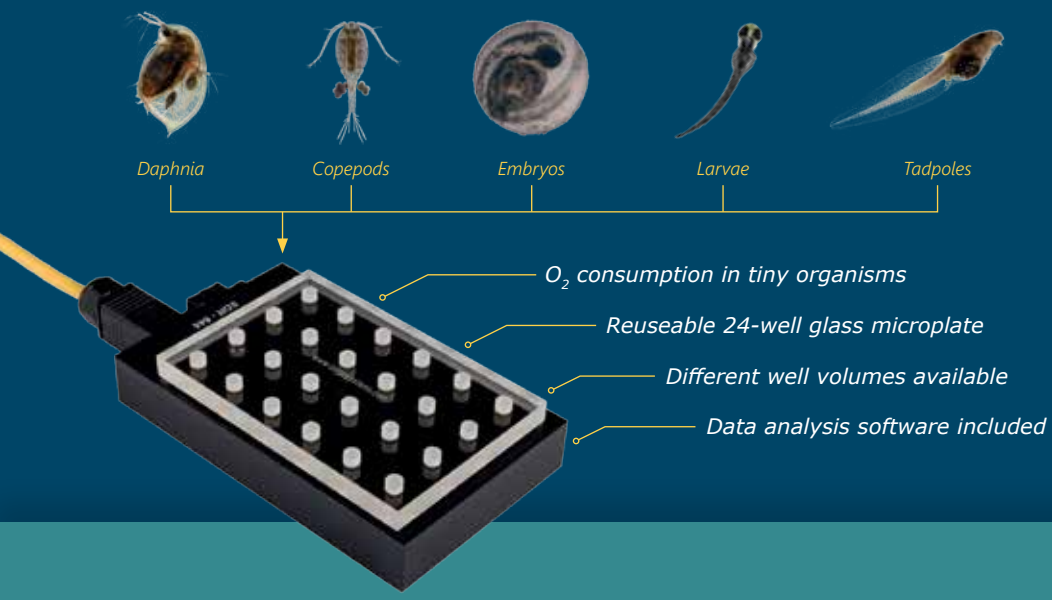

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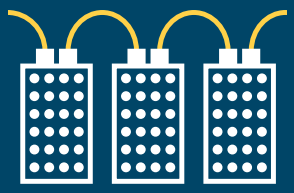

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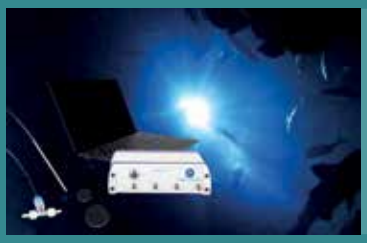

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