

SICB 2021

FINAL PROGRAM

Virtual: 3 January - 28 February 2021

#SICB 2021



**The Society for Integrative
and Comparative Biology**

with the
American Microscopical Society
The Crustacean Society

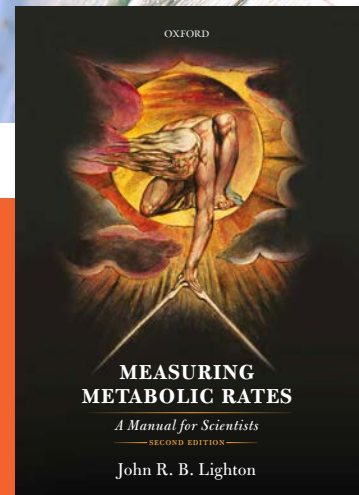
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The Society for Integrative and Comparative Biology

FINAL PROGRAM

Virtual

3 January - 28 February 2021
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Future Meeting Dates

3-7 January 2022
Phoenix, Arizona

3-7 January 2023
Austin, Texas

The Society for Integrative and Comparative Biology

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Welcome to SICB 2021

Message from the President

Welcome to SICB's first ever virtual meeting! In these uncertain times it has been an enormous pleasure to see the superb abstracts submitted for SICB 2021. Great science is the hallmark of our annual meetings, and despite everything, this year is no exception!

I'm sorry not to get to see everyone in person this year, but I'm also excited about the opportunities offered by a virtual meeting. We have decided to break out of the typical 5-day meeting format and run SICB 2021 over a two month period from January 3rd to February 28th. The goal is to maximize participation by offering flexibility for people attending from time zones worldwide and for all of us who have exceptional family, personal and professional challenges this year.

Our guiding principles in designing the virtual meeting have been: (1) to capture the spirit, scientific value, and networking value of our in-person meetings, (2) to embrace this digital format as an opportunity to broaden the reach of SICB and make our community more accessible and inclusive for all scientists and students, and (3) to offer many ways to participate in the meeting at your own pace and schedule over an extended period during January and February.

The first five days of the meeting will be the most intense, with live-streaming symposia, student prize sessions and plenary events. These will all be recorded for on-demand viewing. Contributed oral and poster presentations will be available on demand throughout the two month period and there will be extensive opportunities for "live" (Zoom) interactions as well as text-based chat conversations. SICB has selected Pathable as the virtual meeting platform for SICB 2021 with integrated Zoom for webinars and meetings. No platform has all of the features we would like, but we think Pathable is the best for promoting exciting interactions and networking opportunities across the two months of SICB 2021.

In short, SICB 2021 is still your SICB meeting with the same outstanding science, but with more flexibility and opportunities for broader participation.

Beth Brainerd



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EXAMPLES OF NOTEWORTHY KITS

Corticosterone ELISA Kit (K014-H)

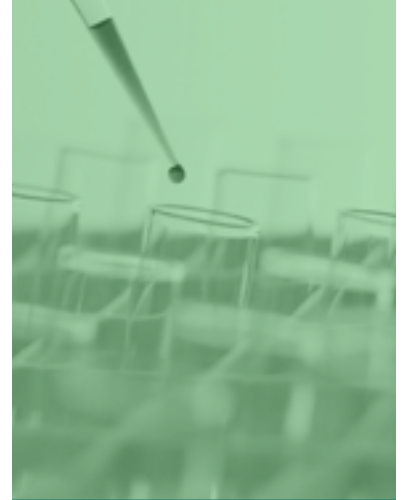
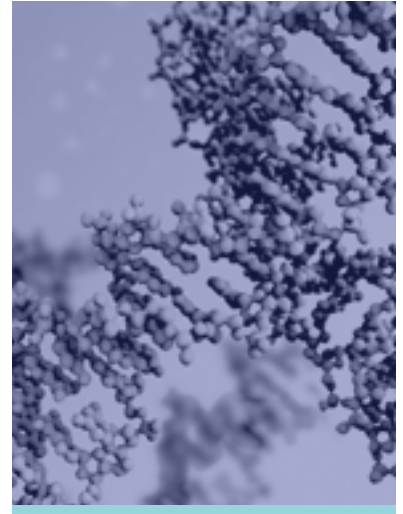
- Multi-Format: 50 μ L or 100 μ L formats
- Sensitivity: 20.9 pg/mL in 50 μ L format, 17.5 pg/mL in 100 μ L format
- Small sample size: as little as 2 μ L plasma

Testosterone ELISA Kit (K032-H)

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

Progesterone ELISA Kit (K025-H)

- Sensitivity: 47.9 pg/mL
- Sample types include fecal extracts, urine



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Adam Summers
Editor, *Integrative Organismal Biology*

Brett J. Burk
Executive Director

Co-Sponsoring Societies

American Microscopical Society (AMS)
The Crustacean Society (TCS)

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

Thank you to the following SICB Sponsors

PLATINUM



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Special Lectures



Opening Plenary

Dr. Cassandra Extavour

Sunday 3 January,
12:00 PM – 1:30 PM

Impact and discovery: extreme
movement in an interdisciplinary
and political world



Moore Lecture

Dr. Claude Steele

Thursday 7 January,
12:30 PM – 1:30 PM

Stereotype threat and identity threat:
The science of a diverse community



Gans Award Address

Dr. Martha Muñoz

Sunday 3 January,
7:00 PM – 7:30 PM

'Constraint', a double-edged sword for
evolution



Bern Award Lecture

Dr. Michaela Hau

Wednesday 5 January,
12:30 PM – 1:30 PM

Hormone-mediated phenotypic
plasticity: is there an optimal hormonal
phenotype?



Bartholomew Lecture

Dr. Roslyn Dakin

Monday 4 January,
12:30 PM – 1:30 PM

The scaling of behavior: insights into
competitive and cooperative systems



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Symposia

Monday 4 January

- S1: Blinded By the Light: Effects of Light Pollution Across Diverse Natural Systems
- S2: Genomic Perspectives in Comparative Physiology of Mollusks: Integration Across Disciplines
- S3: Physical Mechanisms of Behavior

Tuesday 5 January

- S4: Biology Beyond the Classroom: Experiential Learning Through Authentic Research, Design, and Community Engagement
- S5: An Evolutionary Tail: Evo-Devo, Structure, and Function of Post-Anal Appendages
- S6: Spatiotemporal Dynamics of Animal Communication

Wednesday 6 January

- S7: The Integrative Biology of Pigment Organelles
- S8: The Biology of Sticky: Adhesive Silk, Fiber, and Glue Biomaterials Across Eukaryota
- S9: Sending and Receiving Signals: Endocrine Modulation of Social Communication

Thursday 7 January

- S10: Metachronal Coordination of Multiple Appendages for Swimming and Pumping
- S11: Biology's Best Friend: Bridging Disciplinary Gaps to Advance Canine Science
- S12: Manakin Genomics: Comparative Studies of Evolution And Behavior an a Unique Clade of Birds

Best Student Presentations

Sunday 3 January

- BSP-1: DAB Best Student Presentation: Marlene Zuk Award
- BSP-2: DCB Best Student Presentation: Mimi A.R. Koehl and Steven Wainwright Award; Gans Award Address
- BSP-3: DCE Best Student Presentation: Aubrey Gorbman Award
- BSP-4: DEDB Best Student Presentation
- BSP-5: DEDE Best Student Presentation
- BSP-6: DEE Best Student Presentation: Huey Award
- BSP-7: DIZ Best Student Presentation: Mary Rice Award
- BSP-8: DNNSB Best Student Presentation
- BSP-9: DOB Best Student Presentation: Rising Star in Organismal Botany Award
- BSP-10: DPCB Best Student Presentation: Wake Award
- BSP-11: DVM Best Student Presentation: D. Dwight Davis Award

Sable Systems Congratulates **ROSLYN DAKIN**

Assistant Professor
Department of Biology
Carleton University



The 2021 Winner of the George A. Bartholomew Award



George A. Bartholomew

Dr. Dakin won this year's award for her impressive breadth of research ranging from biomechanics to behavior and endocrinology to morphology.

We look forward to her lecture entitled *"The scaling of behavior: insights into competitive and cooperative systems"*.

The lecture will be 12:30 PM EDT
on Tuesday, January 5, 2021.



Special Events

Wednesday 6 January

Open Conversation about SICB and Events in DC

5:30 PM – 6:00 PM

Thursday 7 January

Can We Talk 2: “White Allies”

1:00 PM – 2:10 PM

We invite all to view a special screening of the film *Can We Talk 2: “White Allies”*. This film, hosted by the Broadening Participation Committee, is a follow-up to last year's screening of *Can We Talk: Difficult Conversations with Underrepresented People of Color on Allyship in STEM*. *Can We Talk 2: “White Allies”* explores the issue of sense-of-belonging in STEM for underrepresented people of color (UR-POC) and focuses on the complexity of allyship, offers different strategies for supporting UR-POC, and emphasizes the importance of cultural humility. Please join filmmaker Dr. Kendall Moore (from the University of Rhode Island) for this screening of “White Allies”. Also, please join us for one of three brief hour-long discussions that Dr. Moore will facilitate.

Open Conversation about the events in DC

3:30 PM – 4:00 PM

Please join the SICB leadership for a town-hall conversation about the events in Washington DC and their impact on SICB 2021. This will be a Zoom meeting (not a webinar) where everyone is invited to unmute themselves and speak.

Discussion on Allyship

7:00 PM – 8:30 PM

Open Conversation about the events in DC

7:30 PM – 8:00 PM

Wednesday 13 January

Ask An Expert: Help with R stats, comparative methods, and trait evolution

4:30 PM – 6:30 PM

Friday 15 January

A Conversation: Support and Sense of Belonging in STEM

1:00 PM – 2:00 PM

“White Allies” explores the issue of sense of belonging in STEM for underrepresented people of color (UR-POC) and focuses on the complexity of allyship, offers different strategies for supporting UR-POC, and emphasizes the importance of cultural humility. Attendance is limited to 75.

A Conversation on Intersectionality in STEM

5:00 PM – 6:00 PM

“White Allies” explores the issue of sense of belonging in STEM for underrepresented people of color (UR-POC) and focuses on the complexity of allyship, offers different strategies for supporting UR-POC, and emphasizes the importance of cultural humility. Attendance is limited to 75.

Tuesday 19 January

Ask An Expert: R Stats, Morphometrics, Multivariate Analysis, Trait Evolution

4:30 PM – 6:30 PM

Thursday 21 January

Ask An Expert: Genetics, Genomics, Ancient DNA, Bioinformatics

4:30 PM – 6:30 PM

Tuesday 26 January

Ask An Expert: Anatomical Imaging (CT scanning, diceCT, image segmentation)

4:30 PM – 6:30 PM

Friday 26 February

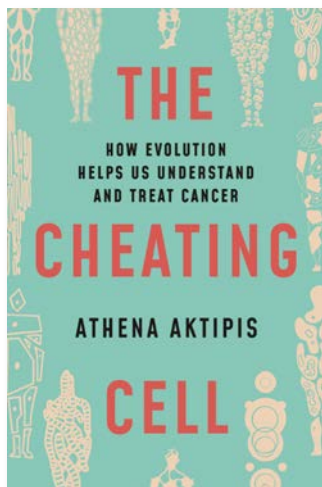
Evolution and Biogeography of Islands: A Session in Honor of Dr. Vicki Funk

12:00 PM – 2:30 PM

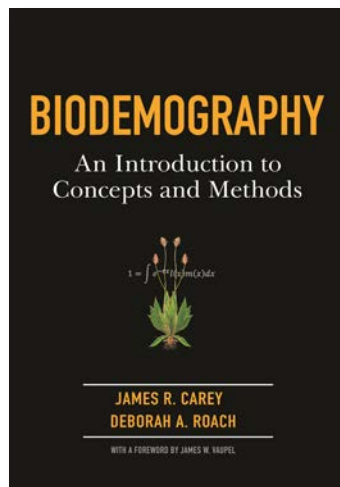
Saturday 27 February

Honoring the Life and Legacy of Dr. George Gilchrist: Evology, Evolution, and Physiology

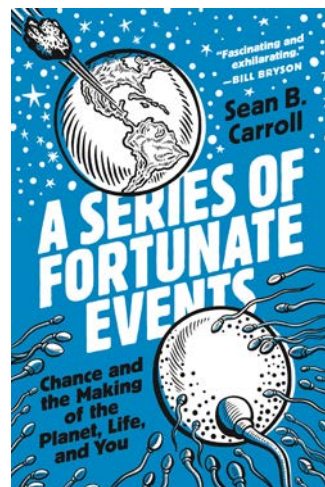
10:15 AM – 3:30 PM



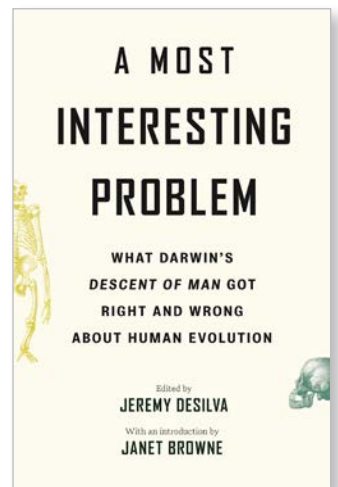
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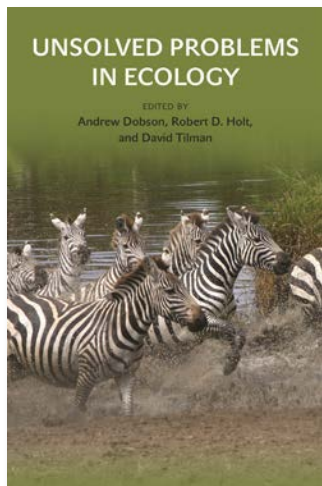
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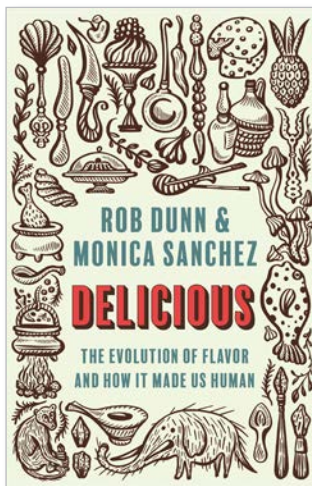
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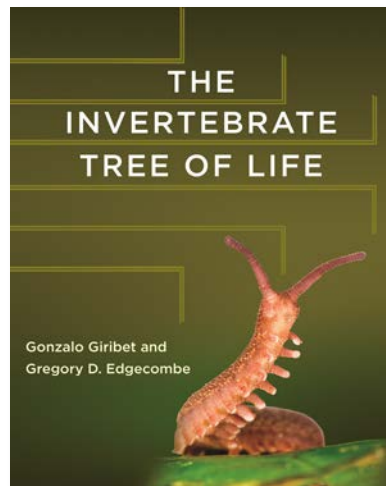
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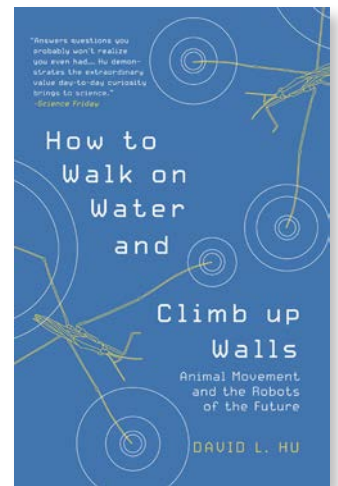
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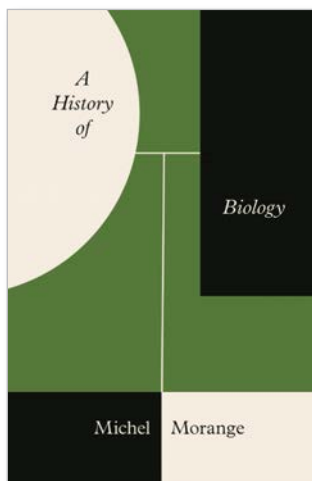
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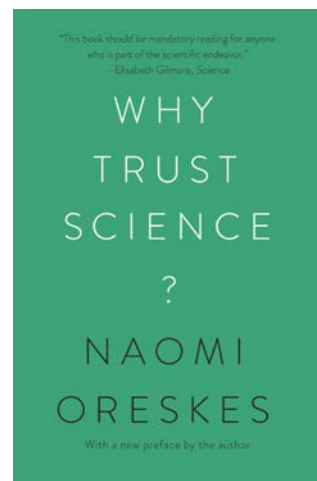
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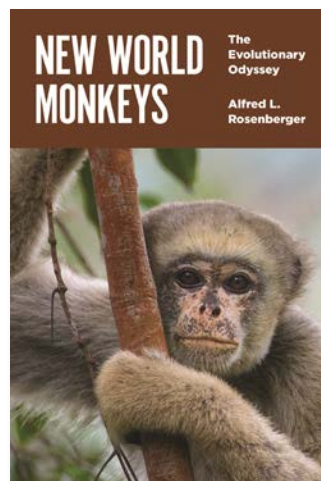
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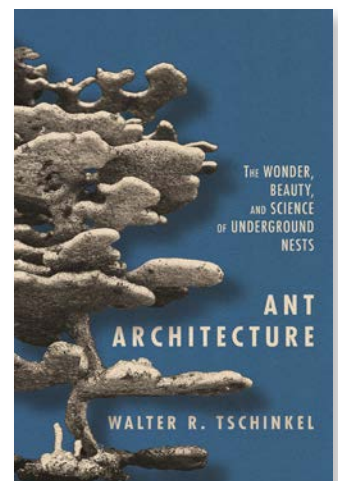
Hardcover \$29.95



Paperback \$18.95



Hardcover \$39.95



Hardcover \$29.95

Meetings

Thursday 7 January

TCS Board Meeting
10:00 AM – 2:00 PM

Society-Wide Member Meeting
12:00 PM – 1:00 PM

Join us for our annual society-wide member meeting. In today's meeting we'll present some happy SICB 2021 meeting statistics and open the floor for questions in the Chat box. All questions for the SICB leadership will be welcome.

Friday 8 January

TCS Member Meeting
10:00 AM – 11:00 AM

DEE Member Meeting
12:00 PM – 1:00 PM

AMS Executive Committee Meeting
1:00 PM – 3:00 PM

DCB Member Meeting
1:00 PM – 2:00 PM

DAB Member Meeting
2:00 PM – 3:15 PM

DCE Member Meeting
3:00 PM – 4:15 PM

DVM Member Meeting
4:00 PM – 5:00 PM

Monday 11 January

DIZ Member Meeting
2:00 PM – 3:15 PM

DOB Member Meeting
3:00 PM – 4:15 PM

Tuesday 12 January

AMS Member Meeting
4:00 PM – 5:15 PM

Wednesday 13 January

DNNB Member Meeting
12:00 PM – 1:15 PM

DPCB Member Meeting
1:00 PM – 2:15 PM

DEDB Member Meeting
2:00 PM – 3:15 PM

Thursday 14 January

DCPB Member Meeting
3:00 PM – 4:15 PM

Tuesday 19 January

DEDE Member Meeting
2:00 PM – 3:15 PM

Monday 25 January

Division Secretaries Meeting
11:00 AM – 12:30 PM

Executive Committee Meeting #1
1:00 PM – 4:00 PM

Tuesday 26 January

IOB Editorial Board Meeting
10:00 AM – 11:00 AM

Student/Postdoctoral Affairs Committee Meeting
12:00 PM – 1:30 PM

Educational Council Meeting
1:00 PM – 4:00 PM

Wednesday 27 January

Membership Committee Meeting
12:00 PM – 1:00 PM

Broadening Participation Committee Meeting
1:00 PM – 2:00 PM

Society-wide Member Meeting
2:00 PM – 3:15 PM

Development Committee Meeting
3:00 PM – 4:30 PM

Thursday 28 January

Student Support Committee Meeting
11:00 AM – 12:30 PM

Public Affairs Committee Meeting
1:00 PM – 2:30 PM

Division Chairs, President/President-Elect Meeting
1:00 PM – 2:00 PM

POs, ICB editor and Symposium Organizers for SICB 2022 Meeting
2:00 PM – 3:30 PM

Advisory Committee Meeting
3:00 PM – 4:00 PM

Friday 29 January

Nominating Committee Meeting
2:00 PM – 3:30 PM

Monday 22 February

Executive Committee Meeting #2
1:00 PM – 3:00 PM

Sunday 28 February

Closing Ceremony
1:00 PM – 2:00 PM

Journal of Experimental Biology

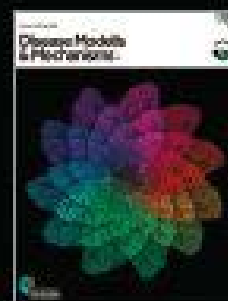
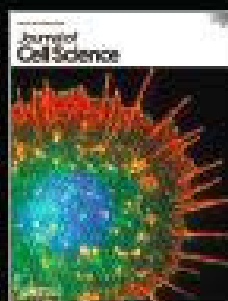
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Our journals



Socials

Saturday 2 January

Outgroup LGBTQIA+ Social

8:00 PM – 9:30 PM

You're invited to our annual Outgroup LGBTQIA+ social! Come join us to connect with other LGBTQIA+ SICB members for casual conversations.

Friday 8 January

DAB Social

3:00 PM – 4:30 PM

DPCB Social

3:00 PM – 5:00 PM

DCB-DVM Social

5:00 PM – 7:00 PM

Saturday 9 January

Game time! Trivia

5:00 PM – 7:00 PM

The PAC invites you to celebrate the weekend with fun online games with PAC and fellow SICB members! Each Saturday we'll play different games, including Celebrity, Dungeons & Dragons, Werewolf/Mafia, Jackbox games and more!! Steam Remote Play will be used for some of these events. Individual events will be announced during the live conference dates (Jan 3-8).

Saturday 16 January

Game time! DnD

5:00 PM – 7:00 PM

Tuesday 19 January

DEDE Social

3:00 PM – 5:00 PM

Wednesday 20 January

DEDB Social

1:00 PM – 2:00 PM

Saturday 23 January

Game time! Jackbox Games/Among Us

5:00 PM – 7:00 PM

Friday 29 January

DEE - Division of Ecology & Evolution Social

12:00 PM – 1:00 PM

Saturday 30 January

DCB-DVM Social Version 2.0

3:00 PM – 5:00 PM

Game time! Werewolf/Mafia Among Us

5:00 PM – 7:00 PM

Saturday 30 January

DCB-DVM Social Version 2.0

3:00 PM – 5:00 PM

Game time! Werewolf/Mafia Among Us

5:00 PM – 7:00 PM

Saturday 2 February

Game time! SICB Trivia *BIPOC NIGHT*

5:00 PM – 7:00 PM

Saturday 13 February

Game time! DnD (Valentine)

5:00 PM – 7:00 PM

Friday 19 February

DNNSB Social

5:00 PM – 7:00 PM

Saturday 20 February

Game time! Jackbox Games

5:00 PM – 7:00 PM

Saturday 27 February

Game time! Werewolf/Mafia

5:00 PM – 7:00 PM

Sunday 28 February

End of SICB Society-wide Social

2:00 PM – 4:00 PM

Workshops

Wednesday 6 January

PAC Wellness Wednesdays - Chaos, A People's Medicine

1:30 PM – 2:00 PM

What is resilience in the face of disastrous, unpredictable and unprecedented change? What happens when our epistemologies, our scientific rationality, our understanding of the known universe is not diverse enough to serve and predict those things which stare us in the face causing us to bow to their power? In this workshop, we will explore herbal medicine as people's medicine and come to terms with chaos as we move forwards in this new reality.

Tuesday 12 January

Setting up a small animal respirometry system

4:00 PM – 6:00 PM

Respirometry is a versatile and powerful tool that can seem complicated until you try it. In this video, we will set up a basic respirometry system and explain the principles that go into system design.

Wednesday 13 January

PAC Wellness Wednesdays - Simple and Effective Practices for Digital Wellness

1:30 PM – 2:00 PM

COVID-19 and working from home have resulted in more time spent on our devices, leading to increased digital distraction and stress. In this 30-minute workshop you will learn concrete, simple changes you can make to your digital environment to reduce distraction and work more efficiently; as well as short, effective practices you can do throughout your screen-filled day to modulate your nervous system toward desired states of calm, focus, and creativity.

Friday 15 January

Transferrable skills in academia and non-academia

12:00 PM – 1:30 PM

Whatever career students and postdocs from biological backgrounds choose, there are often transferrable skills that can help them along in that career, and it helps to know in advance what those skills are so they can be incorporated into training, or emphasized more, where possible. This SPDAC workshop will bring together experts from diverse fields to first hold a panel discussion of what transferrable skills are in different fields, and then have “breakout sessions” focused on their particular fields so that students and postdocs can have discussions focused on careers and skills (and how to match them).

Engaging in local policy and government

3:00 PM – 4:00 PM

Increasingly, the decisions made by local government are of a scientific nature. However, it can be difficult for local governments to obtain the scientific expertise necessary to evaluate complicated scientific issues. Members of SICB can help to fill this gap by engaging in local government. This workshop will cover determining avenues of engagement locally, the best way to communicate with local policy makers, and how to run for office yourself.

Tuesday 19 January

NSF updates with program officers

3:00 PM – 4:30 PM

Come join this workshop to learn about NSF funding opportunities, integrative research and education, and Q&A with NSF staff.

Wednesday 20 January

PAC Wellness Wednesdays - Simple and Effective Practices for Digital Wellness

11:00 AM – 11:30 AM

COVID-19 and working from home have resulted in more time spent on our devices, leading to increased digital distraction and stress. In this 30-minute workshop you will learn concrete, simple changes you can make to your digital environment to reduce distraction and work more efficiently; as well as short, effective practices you can do throughout your screen-filled day to modulate your nervous system toward desired states of calm, focus, and creativity.

Thursday 21 January

A Natural Historian's Guide to the CT Galaxy: Step-by-Step Instructions for Preparing and Analyzing Computed Tomographic (CT) Data Using Cross-Platform, Open Access Software

1:00 PM – 4:00 PM

In this workshop, we present a workflow for working with computed tomographic (CT) data using free, open source, cross-platform software. We provide step-by-step instructions that start with acquiring CT data from an imaging center or open access repository, and progress through visualizing, measuring, landmarking, segmenting, and constructing digital 3D models of anatomical structures. We also include instructions for digital dissection, data reduction, and exporting data for use in downstream applications such as Finite Element Analysis or 3D printing. The workshop is especially designed to guide participants with little to no previous experience in working with CT data, but will be useful to any researcher who is interested in learning to work with CT data in the programs Fiji (ImageJ) and 3D Slicer. The workshop consists of two parts: the first is a demonstration of the steps of the workflow, where participants follow along on their own computers processing a CT scan of a fish skeleton downloaded from MorphoSource.org along with the instructor (MorphoSource ID: 15090-27349). In the second half of the workshop, participants have the option to process their own CT datasets, which they can either download from an open-access repository or bring from their own work, with the instructors available for guidance and troubleshooting.

PAC presents: Tech tools for a virtual world

2:00 PM – 3:00 PM

Let's face it, we're spending a lot of time on a computer these days...more than we usually do. Learn about the tools to create a fulfilling online experience, be it teaching, hosting group events, or social gatherings. We'll give special focus to accessibility tools such as auto-captioning, interpretation and describing visual images. This event will feature a 40-minute demonstration and a 20 minute Q&A.

Job hunting tips and tricks: A panel discussion on finding a faculty position in Ecology and Evolutionary Biology

3:00 PM – 4:30 PM

Navigating the faculty job search process is difficult and confusing at the best of times, and perhaps even more so with a pandemic. This workshop will feature a panel with five early career faculty from both research and teaching institutions to discuss their experiences on the job market. Bring your questions and pick the brains of five folks who've 'made' it!

Sunday 24 January

Movement and science: Integrating movement arts to explore and communicate science

12:00 PM – 5:00 PM

Movement is a fundamental part of the biological world and at the core of many art forms. Movement arts (e.g. dance, improvisation, circus, etc.) are especially well-suited for science outreach and education in diverse communities, due to their kinesthetic and deeply communicative nature. Movement can help facilitate a deeper connection to scientific ideas and concepts- making them directly relatable while building one's physical empowerment. In this workshop participants will explore how movement arts can benefit professional science preparation and science communication at all levels (K-12, undergraduate, graduate), and develop strategies for integrating movement exercises into course modules, outreach activities, and even high-impact science communication- from online videos to full theatrical productions. Ultimately these integrative techniques have the power to span disciplines and cultures, and can help alleviate many of the diversity, inclusivity, and equity challenges that currently face STEM research and education.

In this interactive workshop, participants will engage in various movement exercises to tell science- and research-based stories, culminating in a showcase of what groups have created and recorded throughout the workshop. After an interactive discussion and overview, we will explore a series of diverse movement exercises and techniques. We will then work in groups to create original material using these techniques with specific biology foci, which will be recorded and published online. Participants will gain specific tools valuable for use in classrooms and outreach venues and will be better prepared to pursue the integration of art and science at many levels. Participants will also receive tips & tricks for keeping their bodies engaged and healthy throughout the virtual conference.

Due to the virtual nature of this workshop, exercises will focus more on small-scale movements that are especially well suited to classrooms, seated audiences, remote learning, and accessibility. However, there will be portions of the workshop when participants are encouraged to use their whole bodies, space permitting. Two follow-up sessions will be held to aid in finalizing and disseminating each participant's creative material and successfully implementing these techniques in each participant's work/life.

Follow-up Session 1: Original Material. During the main workshop, participants will be designing and creating their own movement-based material in collaborative groups. This first follow-up session will give participants an opportunity to fully peer-edit each other's material, more deeply discuss broader impacts and design, and troubleshoot any technical needs they may have for finalizing their material.

Follow-up Session 2: Implementation and Dissemination. Participants will address peer-edits together and receive collaborative technical assistance in finalizing material for online (and live where relevant) use. Direct guidance and troubleshooting will be given to ensure said material can have the intended impact in whatever area participants have chosen. We will also discuss professional-development aspects and career applications of this type of creative, integrative art-science work; from CV's and grant-writing to whole paradigm shifts in scientific research, education, and outreach.

Wednesday 27 January

PAC Wellness Wednesdays – Beginner pilates

12:00 PM – 1:00 PM

Pilates is an exercise method designed to work the whole body efficiently while building balance, control and precision. The movements are focused and deliberate towards a specific goal and require great concentration. The Pilates method was created by Joseph Pilates who began developing his method of exercise then called "Contrology" during World War One. It has since been developed to incorporate modern knowledge of the body and biomechanics into the Pilates repertoire. Tenley Spencer has been teaching Pilates since 2017. She is additionally trained in Yoga, and Personal Training which helps her approach translate to different body types. Her virtual studio Rhythms Pilates focuses on maintaining the integrity of Joseph Pilates method while meeting the needs of individual body types. Additionally, she is going through training in Somatic Breath Therapy to further aid Joseph's "return to life" principle.

Monday 1 February

The spandrels of San Marco: The power of role-playing games to help students engage with tricky concepts

3:00 PM – 5:00 PM

Students often have difficulty engaging with or forming opinions about complex theoretical topics in biology. In this workshop, participants will learn how to address this through role-playing games. The workshop will include an actual game focused on the “Spandrels of San Marco” adaptationism debate in evolution sparked by Gould and Lewontin’s classic paper. Participants will be assigned a game role based on their responses to a pre-workshop survey, and will be expected to complete some background reading ahead of time. We’ll follow the game with a discussion of role-playing game as a pedagogical tool in science education.

Wednesday 3 February

PAC Wellness Wednesdays - Yoga with Minelli - A Practice to Feel at Home in Your Body

11:00 AM – 12:00 PM

PAC Wellness Wednesdays - Fermenting Power

1:00 PM – 2:00 PM

The process of fermenting food is creating a safe container for things to fall apart. The holding of this container reminds us that life and death can never be understood as two things and that our transformation is depending on beings that we can barely behold. In this workshop, we will be exploring the indigenous technology of fermentation while exploring its implications on social movement and community organizing. In this workshop, we’ll be making sauerkraut while learning about the roles and impacts of microbiota.

Saturday 6 February

Inclusive science storytelling

12:00 PM – 2:00 PM

Storytelling is an essential skill for good science communication. But it’s also essential to tell stories that are as inclusive as possible. In this interactive virtual workshop, we will explore how to engage both general and specialist audiences with technical content using storytelling strategies. We will especially consider how to make our stories inclusive for audiences that are often marginalized from science. Whether you want to improve your conversation skills, presentations, papers, or grants, this workshop will help you prepare for any communication opportunity – and have fun in the process! Key Skills:

- Connect with audiences through your personal motivation for your work.
- Engage and maintain the interest of a target audience.
- Distill content into clear and concise narrative elements.
- Make content inclusive and accessible.

BioMaking with bacterial cellulose: character clothing craft

2:00 PM – 3:30 PM

In this workshop, BioJam teens will invite participants to explore a biomaking creative craft activity using pre-grown and dried bacterial cellulose. Participants will imagine the future of fashion using laser cut paper figures that they can dress. By blending the familiar with the foreign, this project highlights bacteria and microbes as collaborators in a future based on sustainable, circular design. In a time of intense fear of the microbial world, we create an opportunity for a positive, playful, and hands-on interaction with our microscopic environment. Recipes and biomaking explorations will be shared from the BioJam camp program.

Tuesday 9 February

Increasing your publishing success (for early career researchers)

2:00 PM – 3:30 PM

Join this session to learn how the journals publishing process works, and gain some practical tools and skills to help to increase your chance of publishing your work successfully. We will cover aspects such as the different models of peer review, what editors are looking for in submissions, open access, data archiving, preprints and more.

The session will be run by members of the Editorial Board of Proceedings of the Royal Society B, and members of the Royal Society publishing staff, but information given will help you with submitting to any journal. There will be opportunity to ask questions about any aspect of journals publishing.

Wednesday 10 February

PAC Wellness Wednesdays - Yoga with Minelli - pranayama session - Stress Relieving Breath Practices

11:30 AM – 12:00 PM

Thursday 11 February

SlicerMorph: An open source platform for biologists working with 3D specimen data

12:30 PM – 5:00 PM

This workshop will be an overview of the SlicerMorph toolkit, which enables biologists to retrieve, visualize, measure, annotate, and perform geometric morphometric analyses from high-resolution specimen data both from volumetric scans (CTs and MRs) as well as from 3D surface scanners effectively within 3D-Slicer.

Friday 12 February

Creative writing in the teaching and learning of biology

12:00 PM – 2:00 PM

Do creative writing exercises improve technical writing skills? Can creative writing stimulate new research directions? Will incorporation of creative writing in our curricula improve retention and recruitment of students from diverse backgrounds? Can asking students to write poetry about science improve their learning? In this hands-on workshop, participants will explore the uses of creative writing in the teaching and learning of biology. Participants will engage in creative writing activities, then consider how such exercises could be used in our teaching and mentoring as well as in our own scholarship.

Wednesday 17 February

PAC Wellness Wednesdays - Come out Stronger - Building up resilience during adversity

1:00 PM – 1:45 PM

Meet the JEB Editors

2:00 PM – 3:00 PM

Find out more about the *Journal of Experimental Biology* and our publishing and charitable activities in an informal session hosted by some of the journal Editors. The session will start with a short presentation, including information about what topics the journal covers, what we look for when assessing articles and how we support the comparative physiology and biomechanics communities, in particular ECRs. This will be followed by an informal Q&A session – the perfect opportunity to ask the editors about science, the journal, careers in publishing or anything else! Members of the editorial team that will be on hand to answer questions include: Editor-in-Chief, Craig Franklin; Deputy Editors-in-Chief, Sheila Patek and Patricia Wright; Reviews Editor, Charlotte Rutledge; and Managing Editor, Michaela Handel

Friday 19 February

Extracting More Out of X-ray Micro-CT Scans

1:00 PM – 2:30 PM

This workshop will give better insight on how to use X-ray computed tomography (micro-CT) to generate 3D imaging of the internal structures of specimens nondestructively, prepare a variety of tissue types for maximum contrast—going beyond just resolving calcified tissue—and explore a wide range of organism and applications.

Wednesday 24 February

PAC Wellness Wednesdays - Taking the High Ground - Practices for being less reactive and more grounded at work and in life

1:00 PM – 1:45 PM

Join the Public Affairs Committee each Wednesday for different tips, strategies and activities to manage stress and mental health in academia. Events include mental practices including neurohacking (using creative means to achieve desired nervous regulation) and using embodiment practices to champion imposter syndrome. We'll also have yoga, meditation, and talks on mental health management and creating affirming, inclusive spaces.

These events center around decolonizing mental health and fitness. Anyone and everyone is welcome! Individual events will be announced during the live conference dates (Jan 3-8), and recordings will be available post hoc.

Blender for biologists

3:00 PM – 5:00 PM

In this virtual workshop attendees will learn basic techniques in Blender, a free and open-source 3D computer graphics software toolset, by completing a Blender project on their own computer. We will focus in particular on techniques useful to biologists including: importing scans of specimens as meshes (e.g. from Morphosource), manipulating meshes, creating an animation, and preparing scanned specimens for 3D printing. The workshop will be led by postdoc Aaron Olsen, an experienced Blender user and co-founder of a new cooperative company, 3D Anatomy Studios. No prior experience with Blender is required and the instructor will provide step-by-step instructions and demonstration throughout the workshop and attendees are encouraged to ask questions at any time. Attendees should have the most recent version of Blender installed prior the workshop (Blender is free for all uses); all other necessary files will be provided to attendees during the workshop.

Best Student Presentation Awardees 2020

Cash prizes and journal subscriptions are provided to the awardees by Wiley-Blackwell Publishers.

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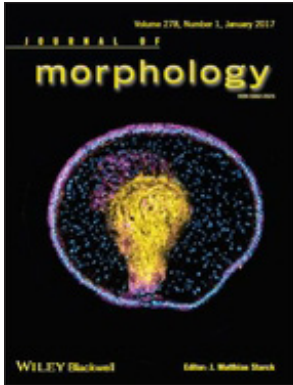
Jess Kanwal, Harvard University

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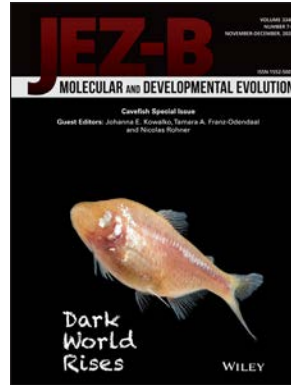
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Sarah Friedman, University of California, Davis

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Natasha Picciani, University of California,
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Shannon Dohr, Macalaster College

Best Student Presentation Awardees 2020



DIZ

Oral Presentation

Mary Rice Award

Samuel Bedgood, University of California, Irvine

Mary Rice Award, Runner-up

Alyssa Liguori, Stony Brook University

Poster Presentation

Alan Kohn Award

Paige Caine, Bucknell University

Alan Kohn Award, Runner-up

Elizabeth Urban-Gedamke, Florida Atlantic University



DOB

Oral Presentation

Rising Star in Organismal Botany

Min Ya, Harvard University
Grey Monroe, Max Planck Institute for Developmental Biology

Poster Presentation

Maria Pimienta, Florida International University

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Symposia and Special Sessions

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

Sunday 3 January

12:00 PM – 12:30 PM President's Opening Address

Chair: Jake Socha

Welcome to the SICB Virtual Meeting!

Brainerd EL; Brown University

12:30 PM – 1:30 PM Opening Plenary

Chair: Jake Socha

From soma to germ line: birth, growth and transformation of a novel gene

Extavour CG; Harvard University

7:00 PM – 7:30 PM Gans Award Address

Chair: Stacey Combes

'Constraint', a double-edged sword for evolution

Muñoz M; Yale University

Monday 4 January

10:15 AM – 7:00 PM Symposium 1

Blinded By the Light: Effects of Light Pollution Across Diverse Natural Systems

Chair: Meredith Kernbach

10:15 am	S1-1	Light at night in the spotlight: an introduction to the symposium	Ferguson SM, Alaasam VJ; College of Wooster, University of Nevada - Reno
6:30 pm	S1-12	ALAN in freshwater vertebrates: physiology, growth, and behavioral perspectives	Gabor CR, Miner K, Forsburg Z; Texas State University
10:30 am	S1-2	Ecological impacts of horizontal artificial nighttime light emissions	Gaston KJ, Ackermann S; University of Exeter, Environment & Sustainability Institute
11:00 am	S1-3	The effects of experimental light pollution on behaviour, physiology and fitness of a wild songbird	Dominoni DM, Visser ME, Spoelstra K; University of Glasgow, Netherlands Institute of Ecology
11:30 am	S1-4	Effects of artificial light at night on the spatiotemporal pattern of bats and insects	Hermans C, Koblitz JC, Litovska I, Visser ME, Spoelstra K; Netherlands Institute of Ecology (NIOO-KNAW), Max Planck Institute of Animal Behavior
2:00 pm	S1-5	Heterogeneity in avian responses to light pollution from a continental perspective	Francis CD; Cal Poly
2:30 pm	S1-6	Light waters: How anthropogenic light alters river ecosystems	Perkin EK, Wilson MJ; Hatfield Consultants, Susquehanna University
3:00 pm	S1-7	Impact of different colors of artificial light at night on phototaxis in aquatic insects	Hölker F, Kühne JL, Jechow A, van Grunsven RHA; Leibniz-Institute of Freshwater Ecology and Inland Fisheries (IGB), Dutch Butterfly Conservation, Wageningen
4:00 pm	S1-8	Experimental investigation of the effects of artificial light at night on avian parental behavior, offspring glucocorticoids, and reproductive success	Injaian AS, Uehling JJ, Taff CC, Vitousek MN; Cornell University, University of Georgia
4:30 pm	S1-9	Effects of light at night and disrupted circadian rhythms on brain and behavior	Nelson RJ; West Virginia University
5:00 pm	S1-10	Mechanisms and mitigation: effects of light pollution on West Nile virus dynamics	Kernbach ME, Martin LB, Unnasch TR, Hall RJ, Jiang RHY, Francis CD; University of South Florida, University of Georgia, California Polytechnic State University
6:00 pm	S1-11	Artificial light at night disrupts trophic and population dynamics of lady beetles and pea aphids in cool conditions	Miller CR, Vitousek MN, Thaler JS; Cornell University

10:15 AM – 6:30 PM Symposium 2

Genomic Perspectives in Comparative Physiology of Mollusks: Integration Across Disciplines

Chair: Omera Matoo

10:15 am	S2-1	Introduction to genomic perspectives in comparative physiology of mollusks: Integration across disciplines	Neiman M, Matoo O; University of Iowa, University of Nebraska
10:30 am	S2-2	Fielding freshwater snail immunity	Adema CM, McQuirk KA, Seppala O, Castillo MG; University of New Mexico, University of Innsbruck, New Mexico State University
11:00 am	S2-3	Multi-omic approaches to reveal interactions between the hard clam and its parasite QPX	Allam B; Stony Brook University
11:30 am	S2-4	Exploring the genomic underpinnings of symbiosis in bobtail squid	Heath-Heckman EAC, Nishiguchi M; Michigan State University, University of California Merced
2:00 pm	S2-5	Bivalve molluscs as model systems for studying mitochondrial biology	Ghiselli F, Milani L, Iannello M, Piccinini G; University of Bologna
2:30 pm	S2-6	Phenotypic variation in energy metabolism across New Zealand snail populations	Matoo OB, Sharbrough J, Neiman M, Montooth KL; University of Nebraska-Lincoln, New Mexico Institute of Mining and Technology, University of Iowa
3:00 pm	S2-7	Testing how broad physiological tolerances are shaped by selection: transcriptomic variation in salinity, temperature, and hypoxia responses in the eastern oyster	Kelly MW, Smith HN, Sirovy KA, LaPeyre JF, List SM, Johnson KM; Louisiana State University, California Polytechnic State University
4:00 pm	S2-8	Genetic and environmental correlates of physiology and gene expression for the eastern oyster in the southeastern United States	Furr D, Ketchum RN, Leach WB, Ivanina AV, Reitzel AM*; University of North Carolina Charlotte
4:30 pm	S2-9	Pacific oysters (<i>Crassostrea gigas</i>) dramatically recalibrate the model for the upper limit of the eukaryotic mutation rate	Churches N, Chancellor J, Chang P, Nuzhdin S*; University Southern California, Seedoffshore, LLC
5:00 pm	S2-10	A perspective on DNA methylation in bivalves	Roberts SR; University of Washington

10:15 AM – 7:00 PM Symposium 3

Physical Mechanisms of Behavior

Chair: Patrick Green

10:15 am	S3-1	Introduction to the symposium: Physical mechanisms of behavior	Green PA, Rico-Guevara A; University of Exeter, University of Washington
10:30 am	S3-2	When the uterus is a vagina: Intra-horn insemination in the alpaca and consequences to genital morphology coevolution and 3-D shape	Brennan PLR, Sterett M, DiBuono M, Klo K, Marsden R, Schleinig P, Tanner L, Purdy S; Mount Holyoke College
11:00 am	S3-3	Field studies of lizard copulation: from physiological mechanisms of mating to behavioral correlates of paternity	Johnson MA, Kirby R, Fresquez CC, Wang S, Stehle CM, Templeton AR, Losos JB, Kamath A; Trinity University, US Fish and Wildlife Service, University of California Davis, Movement Specialists Physical Therapy, Washington University, University of California Berkeley
11:30 am	S3-4	Seven ways that wings produce sound in flight	Clark CJ; University of California Riverside
2:00 pm	S3-5	Ecological and evolutionary consequences of flexible foraging behavior for bees and flowers	Russell AL; Missouri State University
2:30 pm	S3-6	Hummingbird bill-flower matching	Rico-Guevara A; University of Washington
3:00 pm	S3-7	Chance events and strategic behavior in the predator-prey interactions of fishes	McHenry MJ, Peterson AN, Soto AP; University of California Irvine
4:00 pm	S3-8	What is the point of defensive spines?	Crofts SB; College of the Holy Cross
4:30 pm	S3-9	Don't touch! The function and evolution of defensive spines in mammals	Stankowich T; California State University Long Beach

Symposia and Special Sessions

5:00 pm	S3-10	Q&A on foraging and avoidance: Russell, Rico-Guevara, McHenry, Crofts, and Stankowich	Green PA, Rico-Guevara A; University of Exeter, University of Washington
6:00 pm	S3-11	From Behavior to Architecture and Back: the Evolution of Social ('so-shell') Life in Social Hermit Crabs	Laidre ME; Dartmouth College
6:30 pm	S3-12	Exoskeleton weapons and defenses in crustacean conflicts	Taylor JRA, Lowder K, deVries M; University of California San Diego, NOAA, San Jose State University
7:00 pm	S3-13	Q&A on sexual selection: Brennan, Johnson, Clark, Laidre, and Taylor	Rico-Guevara A, Green PA; University of Washington, University of Exeter

12:30 PM – 1:30 PM George A. Bartholomew Award Lecture

Chair: Ken Welch	The scaling of behavior: insights into competitive and cooperative systems	Dakin R; Carleton University
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Tuesday 5 January

10:30 AM – 7:00 PM Symposium 4

Biology Beyond the Classroom: Experiential Learning Through Authentic Research, Design, and Community Engagement

Chair: Ali Hansen

10:30 am	S4-1	Introduction to the symposium: biology beyond the classroom	Hansen AK; California State University
2:45 pm	S4-10	Skill-building in a molecular biology CURE: A delicate balance of structure and student independence	Beatty AE, Ballen CJ, Driessen EP, Graze RM, Schwartz TS; Auburn University
3:00 pm	S4-11	Using zoos as a context to teach authentic research: reflections from first and second experience students taking introductory chemistry	Hernandez T, Donnelly-Hermosillo D*, Person E, Hansen A; California State University Fresno
3:15 pm	S4-12	Connected while distant: Networking CUREs across classrooms to create community and inspire students	Lanier HC, Connors PK, Varner J, Dizney L, Duggan JM, Erb LP, Yahnke CJ, Flaherty EA, Hanson JD; University of Oklahoma, Colorado Mesa University, University of Portland, California State University Monterey Bay, Warren Wilson College, University of Wisconsin Stevens Point, Purdue University, Biodiversity Research and Education
4:00 pm	S4-13	Interdisciplinary collaboration in undergraduate service-learning	Tucker KP, Glaser RL, Marx M, Kniss A, Moran CE; Stevenson University
4:15 pm	S4-14	Students' experiences in community STEM programs	Nation JM, Hansen AK; California Polytechnic State University, California State University
4:30 pm	S4-15	Nuestra ciencia is our science: microbiology lessons for all	Yep A, Nation JM; California Polytechnic State University San Luis Obispo
4:45 pm	S4-16	Something Very Fishy: An ocean literacy STEAM exhibit impacts how children, teachers, and university students think about science	Childress MJ, Tallapragada M, Prosser KL; Clemson University, Temple University, Educational Entertainment
5:00 pm	S4-17	Forests after Florence: a model to engage disaster-impacted students in informal learning through relevant field research	Katti M, Mulvey K L, Caslin M, Joy A, Orcutt D, Eseryel D; North Carolina State University
5:15 pm	S4-18	Using citizen science to assess the effect of wing pattern and weather on butterfly behavior	Merrill AN, Hirzel GE, Westerman E; University of Arkansas Fayetteville
10:45 am	S4-2	Making interdisciplinary learning continuous across education	Lent DD, Hansen AK; California State University
11:00 am	S4-3	i4's toward tomorrow program: Bioinspired design realized by creativity, collaboration, and connection	Full RJ, Estrada M, Watson L, Bhatti HA; University of California Berkeley, University of California San Francisco
11:15 am	S4-4	Early technology-based intervention promotes self-efficacy in a bioinspired design course	Bhatti HA, Ruopp R, McPherson A, Full RJ; University of California Berkeley

Symposia and Special Sessions

11:30 am	S4-5	Implementing fabrication as a pedagogical tool in vertebrate anatomy courses: motivation, lessons, and outcomes	Staab KL; McDaniel College
11:45 am	S4-6	BioJam Camp, bioexplorations driven by community connections	Takara C, Hu A, Sathish T, Takara E, Tejada I, Medina-Sanchez P, Chavez-Melendez J, Guerrero-Campos A, Haile M, Chappell C; Okada Design, Xinampa Bio, Stanford University
2:00 pm	S4-7	Authentic research in the undergraduate classroom increases knowledge and appreciation for plants	Hove AA, Ward JR, Hiatt AL, Ventura L, Neufeld HS, Boyd AE, Clarke HD, Horton JL, Murrell ZE; Warren Wilson College, University of North Carolina, University of Nebraska, East Tennessee State University, Appalachian State University
2:15 pm	S4-8	How and why does a field course close demographic gaps in EEB?	Zavaleta E, Beltran R, Race A; University of California Santa Cruz
2:30 pm	S4-9	FSBio 201: A CURE-based course that scaffolds research and scientific communication	Whitenack LB, French LB, Hersh BM, Nelson MK, Thu YM; Allegheny College

10:15 AM – 7:30 PM Symposium 5

An Evolutionary Tail: Evo-Devo, Structure, and Function of Post-Anal Appendages

Chair: Janneke Schwaner

10:15 am	S5-1	Introduction to an evolutionary tail: Evodevo, structure, and function of post-anal appendages	Schwaner MJ, Hsieh ST, McGowan CP; University of Idaho, Temple University, Philadelphia, PA
10:30 am	S5-2	Fabulous fish tails: Using morphology to model functional diversity across the fish tree	Donatelli CM, Roberts AS, Baxter D, Abu-Badr L, Naughton L, Han L, Ortiz F, Standen EM; University of Ottawa, University of California Davis, Tufts University, College of William and Mary, Bucknell University, Denison University
11:00 am	S5-3	Testing the relationship of prehensile function and the musculo-skeletal morphology of chameleons using multi-body dynamics	Luger AM, Watson PJ, Dutel H, Fagan MJ, Herrel A, Adriaens D; Evolutionary Morphology of Vertebrates, University of Hull, University of Bristol, CNRS/MNHN
11:30 am	S5-4	Tail responses facilitate lizard reorientation during directed aerial maneuverability	Siddall R, Ibanez V, Byrnes G, Full RJ, Jusufi A*; Max Planck Institute for Intelligent Systems, UZH and MPI for Intelligent Systems, Siena College, University of California Berkeley
2:00 pm	S5-5	Cheetah tail behavior during pursuit	Patel A, Jericevich R, Knemeyer A, Jusufi A; University of Cape Town, Max Planck Institute for Intelligent Systems
2:30 pm	S5-6	How kangaroo rats utilize their tail while re-orienting	Schwaner MJ, Freymiller GA, Clark RW, McGowan CP; University of Idaho, University of California San Diego
3:00 pm	S5-7	The stabilizing function of the tail during arboreal quadrupedalism	Young JW, Chadwell BA, Dunham NT, McNamara A, Phelps T, Hieronymus TL, Shapiro LJ; Northeast Ohio Medical University, Idaho College of Osteopathic Medicine, Cleveland Metroparks Zoo, University of Texas at Austin
4:00 pm	S5-8	Evolution of the tail and lack thereof for aquatic propulsion in mammals	Fish FE, Rybczynski N, Duff CM; West Chester University, Canadian Museum of Nature
4:30 pm	S5-9	Towards dynamic locomotion of legged robots using biomimetic articulated robotic tails	Liu Y, Ben-Tzvi P*; Virginia Tech
5:00 pm	S5-10	Tail beat synchronization of schooling giant danios is altered after lateral line ablation and regeneration	Mekdara PJ, Schwalbe MAB, Tytell ED; National Institute of Health, Lake Forest University, Tufts University
6:00 pm	S5-11	Genetics and function of repeatedly-evolved tail length differences in deer mice	Hager ER, Kingsley EP, Harringmeyer OS, Hoekstra HE; Harvard University
6:30 pm	S5-12	Nervous system compensation following tail loss and regeneration in the leopard gecko (<i>Eublepharis macularius</i>)	Bradley S, Bailey CDC, Bent L, Howe E, Vickaryous MK; University of Guelph
7:00 pm	S5-13	The degenerate tale of ascidian tails	Swalla BJ; University of Washington

Symposia and Special Sessions

10:15 AM – 7:30 PM Symposium 6

Spatiotemporal Dynamics of Animal Communication

Chair: Kim Hoke

10:15 am	S6-1	Introduction to the symposium: Spatiotemporal dynamics of animal communication	Hoke KL, Hensley NM, Kanwal JK, Wasserman SM, Morehouse NI; Colorado State University, Cornell University, California Institute of Technology, Wellesley College, University of Cincinnati
10:30 am	S6-2	Deep learning tools for the analysis of movement, identity and behavior	Mathis A; EPFL
11:00 am	S6-3	Videography using a fast lock on, gimbal-mounted tracking camera to study animal communication	Vo-Doan TT, Straw AD*; University of Freiburg
11:30 am	S6-4	Defining neural principles underlying naturalistic behavior through Motion Sequencing	Datta SR; Harvard Medical School Department of Neurobiology
2:00 pm	S6-5	Sexual selection, natural selection, and artificial intelligence: Implementing technological advances to understand variation in signaling behavior	Symes LB, Madhusudhana S, Martinson SJ, Kernan CE, ter Hofstede HM; Cornell University, Dartmouth College
2:30 pm	S6-6	Beyond cognitive templates	Sung JY, Harris OK, Hensley NM, Chemero AP, Morehouse NI; University of Cincinnati, Cornell University
3:00 pm	S6-7	How signaling geometry shapes the efficacy and evolution of animal communication systems	Echeverri S, Miller AE, Chen J, McQueen E, Plakke M, Spicer M, Hoke KL, Stoddard MC, Morehouse NI; University of Pittsburgh, Princeton University, Emory University, University of Kansas, University of Puget Sound, Colorado State University, University of Cincinnati
4:00 pm	S6-8	Spatiotemporal dynamics of a hummingbird courtship dive	Stoddard MC, Hogan BG; Princeton University
4:30 pm	S6-9	Social information use in greater sage-grouse in response to habitat structure and social network	Logsdon RM, Krakauer AH, Hylback A, Mitchell K, Dryer B, Forbey JS, Patricelli GL; University of California Davis, Boise State University
5:00 pm	S6-10	Orientation control via spatiotemporal integration in fly flight	Mongeau JM; Penn State University
6:00 pm	S6-11	Signals, space and time: Exploring the spatiotemporal dimension of animal communication networks	Reichert MS, Carlson NV, Enriquez MS, Raja SV; Oklahoma State University, Max Planck Institute of Animal Behaviour, University of Minnesota, National Centre for Biological Sciences (TIFR)
6:30 pm	S6-12	Internal state: bidirectional brain-body axes of communication	Kanwal J, Davila K, Frazer R, Givens M, Castro Perez DL, Turner G, Coddington E, Wasserman S; California Institute of Technology, Willamette University, Wellesley College
7:00 pm	S6-13	Everything in modulation: neuromodulators as keys to understanding behavioral dynamics	Zornik E, Barkan CL, Descant KD, Lloyd-Burchett P, Leininger EC; Reed College, New College of Florida

12:30 PM – 1:30 PM Moore Lecture

Chair: Lisa Whitenack

Stereotype threat and identity threat: The science of a diverse community

Steele CM; Stanford University

Wednesday 6 January

10:15 AM – 7:00 PM Symposium 7

The Integrative Biology of Pigment Organelles

Chair: Florent Figon

10:15 am	S7-1	Introduction to the symposium: The integrative biology of pigment organelles	Figon F, Casas J, Deravi L; Université de Tours, Northeastern University
10:30 am	S7-2	Origin of color in butterflies	Reed RD, Brack BJ; Cornell University
11:00 am	S7-3	Organic crystals in animal coloration and vision	Shavit K, Yallapragada VJ, Weiner S, Oron D, Sagi A, Addadi L, Palmer B; Ben-Gurion University, Weizmann Institute
11:30 am	S7-4	Colors as life history traits: Insights from the pigment-based coloration of two butterfly species	Morehouse NJ; University of Cincinnati
2:00 pm	S7-5	Optics and development of highly iridescent feathers: the case of hummingbird melanosomes	D'Alba L, Jeon DJ, Yeo JS, Manceau M, Shawkey MD; Universiteit Gent, Yonsei University, Collège de France
2:30 pm	S7-6	Melanosome protein contents and oculocutaneous albinism: The importance of remaining neutral	Marks MS; Children's Hospital of Philadelphia, University of Pennsylvania
3:00 pm	S7-7	BLOC-dependent regulation of melanocyte pigmentation and its defects in the Hermansky-Pudlak Syndromes	Delevoe C; PSL Research University
4:00 pm	S7-8	Parallels of melanization in <i>Cryptococcus neoformans</i> and <i>Anopheles gambiae</i>	Camacho E, Anglero-Rodriguez Y, Smith DFQ, Jacobs E, Dong Y, Cordero RJB, Dimopoulos G, Casadevall A; Johns Hopkins University
4:30 pm	S7-9	Protein-pigment interactions facilitate dynamic color change in cephalopod chromatophores	Deravi LF; Northeastern University
5:00 pm	S7-10	Within-cell cycle of endolysosome-related pigment organelles in crab spiders leads to reversible color changes	Figon F, Hurbain I, Heiligenstein X, Trépout S, Medjoubi K, Somogyi A, Delevoe C, Raposo G, Casas J; Université de Tours, Université PSL, Kremlin-Bicêtre France, Université Paris-Saclay, Synchrotron SOLEIL, Saint-Aubin, Gif sur Yvette
6:00 pm	S7-11	Rainbows in nature: disordered photonic structures tuned by pigments	Wilts BD; Adolphe Merkle Institute
6:30 pm	S7-12	Synthetic biogenesis of carotenoid-rich plastids for crop biofortification	Llorente B; Macquarie University, CSIRO Synthetic Biology Future Science Platform

10:15 AM – 5:30 PM Symposium 8

The Biology of Sticky: Adhesive Silk, Fiber, and Glue Biomaterials Across Eukaryota

Chair: Mercedes Burns

10:15 am	S8-1	The ties that stick: an introduction to sticky biomaterials	Burns M, Stellwagen SD; University of Maryland Baltimore County, University of North Carolina Charlotte
10:30 am	S8-2	Sticky predator-prey interactions: The ecology of adhesive secretions in arachnids	Wolff JO; Macquarie University
11:00 am	S8-3	Characterizing frog tongue stickiness and other reversible adhesive mechanisms	Noel AC; Georgia Tech Research Institute
11:30 am	S8-4	Viscid spider silk shows robust adhesion on varied natural surfaces	Blackledge TA, Alicea A, Onyak A, Htut K, Singla S, Dhinojwala A; University of Akron
2:00 pm	S8-5	The hidden roles of silk fibers during adhesion in arthropod capture threads	Piorkowski D; Tunghai University
2:30 pm	S8-6	Molecular correlates of spider aqueous glue mechanics	Ayoub NA, Friend K, Hayashi CY, Opell BD; Washington and Lee University, American Museum of Natural History, Virginia Tech

Symposia and Special Sessions

3:00 pm	S8-7	The genetics of sticky: comparing glue sequences across multicellular eukaryota	<i>Stellwagen SD, Burns M; University of North Carolina at Charlotte, University of Maryland Baltimore County</i>
4:00 pm	S8-8	Adhesion with tough gels: inspiration from the sticky defensive secretions of dusky slugs	<i>Smith AM; Ithaca College</i>
4:30 pm	S8-9	It's a trap! How sticky fluids help carnivorous plants catch insect prey	<i>Kang V, Federle W; University of Cambridge</i>
5:00 pm	S8-10	Snail epiphragm inspired intrinsically reversible superglues	<i>Yang S, Jolly J, Cho H, Wu G, Fortoul N, He Z, Gao Y, Jagota A; University of Pennsylvania, Lehigh University</i>

10:15 AM – 7:00 PM Symposium 9

Sending and Receiving Signals: Endocrine Modulation of Social Communication

Chair: Karen Maruska

10:15 am	S9-1	Introduction to the symposium sending and receiving signals: endocrine modulation of social communication	<i>Maruska KP, Butler JM; Louisiana State University, Stanford University</i>
10:30 am	S9-2	Multiple hormonal pathways modulate active sensory and communication signals in weakly electric fish	<i>Markham MR, Nourbakhsh-Rey M, Wiser SD, Maltby RC; University of Oklahoma</i>
11:00 am	S9-3	Circulating prostaglandin F2a rapidly alters olfactory perception in female goldfish causing them to perceive an androgen released by mature conspecific males as an attractive sex pheromone	<i>Sorensen PW, Levesque H; University of Minnesota</i>
11:30 am	S9-4	Chemical signals control our social lives: Lessons from lizards	<i>Campos SM; Swarthmore College</i>
2:00 pm	S9-5	Androgenic modulation of multimodal signal structure in foot-flagging frogs	<i>Mangiamele LA; Smith College</i>
2:30 pm	S9-6	Reproductive state-dependent visual plasticity in a cichlid fish	<i>Butler JM, Maruska KP; Louisiana State University, Stanford University</i>
3:00 pm	S9-7	Modulation of acoustic communication in an African cichlid fish	<i>Maruska KP; Louisiana State University</i>
4:00 pm	S9-8	Dopamine seasonally modulates adaptive sensitivity of the inner ear for reproductive communication in a vocal fish	<i>Perelmuter JT, Sisneros JA, Forlano PM; Cornell University, University of Washington, Brooklyn College</i>
4:30 pm	S9-9	Neuromodulatory feedback to sensory systems: how serotonin conveys contextual information to the auditory midbrain	<i>Petersen CL, Hurley LM*; University of Minnesota Twin Cities, Indiana University</i>
5:00 pm	S9-10	Estrogens synthesized in auditory circuits are neuromodulators of cellular physiology and behavior	<i>Remage-Healey LR; University of Massachusetts Amherst</i>
6:00 pm	S9-11	Social communication across reproductive boundaries: hormones and the auditory periphery	<i>Gall MD, Baugh AT, Lucas JR, Bee MA; Vassar College, Swarthmore College, Purdue University, University of Minnesota</i>
6:30 pm	S9-12	Glucocorticoids, acoustic communication and sexual selection in treefrogs	<i>Leary CJ; University of Mississippi</i>

12:30 PM – 1:30 PM Bern Award Lecture

Chair: Kathleen Hunt

Hormone-mediated phenotypic plasticity: is there an optimal hormonal phenotype?

Hau M; Max Planck Institute for Ornithology, University of Konstanz

Thursday 7 January

10:15 AM – 7:00 PM Symposium 10

Metachronal Coordination of Multiple Appendages for Swimming and Pumping

Chair: Margaret Byron

10:15 am	S10-1	Introduction to the symposium	Byron ML, Murphy DW*, Santhanakrishnan A; Penn State University, University of South Florida, Oklahoma State University
10:30 am	S10-2	Transitions in cilia coordination	Kanso E; University of Southern California
11:00 am	S10-3	The swimming kinematics of barnacle cyprid larvae using permanently fused setules	Lamont EI, Emlen RB; University of Washington, University of Oregon, OIMB
11:30 am	S10-4	Acrobatic maneuvers of larval copepods	Takagi D; University of Hawaii
2:00 pm	S10-5	Pumping by oscillating plates: viscous to inertial transitions in metachronal arrays	Kiger KT; University of Maryland
2:30 pm	S10-6	A fluid-structure model for the parapodia of tomopterids	Hoover AP, Katija K, Daniels J, Osborn K; University of Akron, Monterey Bay Aquarium Research Institute, Smithsonian Institution
3:00 pm	S10-7	Spatiotemporal asymmetry in ctenophores: metachronal locomotion at intermediate Reynolds number	Herrera-Amaya A, Byron ML*; Pennsylvania State University
4:00 pm	S10-8	Hydrodynamics of metachronal paddling	Santhanakrishnan A, Ford MP; Oklahoma State University
4:30 pm	S10-9	Vortex interactions among pleopod pairs in a mantis shrimp swimming at high advance ratios	Garayev K, Murphy D; University of South Florida
5:00 pm	S10-10	Dual phase-shifted ipsilateral metachrony in <i>Americamysis bahia</i>	Ruszczyk M, Webster DR, Yen J; Georgia Institute of Technology
6:00 pm	S10-11	Propulsion and predation in a uniquely shaped oceanic ctenophore	Gemmell BJ, Hawkins O, Colin S, Sutherland K, Costello J; University of South Florida, Roger Williams University, University of Oregon, Providence College
6:30 pm	S10-12	Metachronal moves in the midwater: Swimming of the polychaete <i>Tomopteris</i>	Daniels J, Aoki N, Havassy J, Mushegian N, Katija K, Osborn K; MBARI, National Museum of Natural History, Smithsonian Institution

10:15 AM – 7:00 PM Symposium 11

Biology's Best Friend: Bridging Disciplinary Gaps to Advance Canine Science

Chair: Caleb Bryce

10:15 am	S11-1	Biology's best friend: Bridging disciplinary gaps to advance canine science	Jimenez AG, Bryce C; Colgate University
10:30 am	S11-2	Dog domestication through an ancient evolutionary lens	Larson G; University of Oxford
11:00 am	S11-3	Big and small, short and tall, dog genes tell all	Ostrander EA, Parker HG, Evans JM, Plassais J, Dreger D, Harris A, Davis BW, McIntyre JK, Cairns KM, Ali BM, Hogan AW; National Institutes of Health, University of Rennes, Texas A&M University, New Guinea Highland Wild Dog Foundation, University of New South Wales
11:30 am	S11-4	Characterizing the dog-human bond: A comparative investigation of attachment relationships	Udell MAR, Sipple N, Smith A, Vitale KR, Thielke LE; Oregon State University, Unity College
2:00 pm	S11-5	Dogs as pets and pests: Global patterns of dog activity and health	Bryce CM; University of California Santa Cruz
2:30 pm	S11-6	Heads or tails – random and not-so-random factors that influence dog lifespan	Urfer SR, Promislow DEL, Kaeberlein M, Creevy KE; University of Washington, Texas A&M Veterinary Medicine, Biomedical Sciences

Symposia and Special Sessions

3:00 pm	S11-7	The physiological conundrum that is the domestic dog	<i>Jimenez AG; Colgate University</i>
4:00 pm	S11-8	If you want to run with the big dogs, you need to not be so human	<i>Davis MS; Oklahoma State University</i>
4:30 pm	S11-9	Thinking globally about dog populations and their wildlife conservation relevance	<i>Gompper ME; New Mexico State University</i>
5:00 pm	S11-10	“Anatomy” of a conservation detection dog: How an ordinary mutt becomes an elite canine conservationist	<i>Hurt AL; Working Dogs for Conservation</i>
6:00 pm	S11-11	Broadening the scope of canine science: The dogs of the Nicaraguan forest	<i>Koster JM; University of Cincinnati</i>
6:30 pm	S11-12	Scavenging effects of large canids	<i>Wirsing AJ, Newsome TM; University of Washington, University of Sydney</i>

10:15 AM – 7:00 PM Symposium 12

Manakin Genomics: Comparative Studies of Evolution And Behavior in a Unique Clade of Birds

Chair: Ignacio Moore

10:15 am	S12-1	Manakin genomics: comparative studies of evolution and behavior in a unique clade of birds	<i>Moore IT, Jones BC; Virginia Tech, Bennington College</i>
10:30 am	S12-2	Hormonal control of behavioral sex differences in a tropical bird	<i>Schlinger BA, Chiver I; University of California Los Angeles, Smithsonian Institute, Panama</i>
10:45 am	S12-3	Physiological basis of display evolution in the golden-collared manakin	<i>Fuxjager MJ; Brown University</i>
11:00 am	S12-4	Glucocorticoids correlate with and predict social status in the cooperatively breeding lance-tailed manakin (<i>Chiroxiphia lanceolata</i>)	<i>Jones BC, DuVal EH; Bennington College, Florida State University</i>
11:15 am	S12-5	Gene expression in the social behavior network of the wire-tailed manakin (<i>Pipra filicauda</i>) brain	<i>Horton BM, Ryder TB, Moore IT, Balakrishnan CN; Millersville University, Bird Conservancy of the Rockies, Virginia Tech, East Carolina University</i>
11:30 am	S12-6	The making of an elaborate courtship display: acrobatics, choreographies, and the role of females	<i>Fusani L, Janisch J, Perinet E, Quigley C; University of Vienna, University of Veterinary Medicine</i>
2:00 pm	S12-7	Sexual selection for acrobatic courtship complexity drives increases in cerebellum volume and body size	<i>Day LB, Harvey MC, Helmhout W, Olsson U, Pano G, Hoeksema JD, Lindsay WR; University of MS, Göteborg University, Göteborg University</i>
2:30 pm	S12-8	Dancing in the rain: environmental drivers of behavioral and social variability in White-ruffed Manakin courtship displays	<i>Shogren EH, Boyle WA; University of Rochester, Kansas State University</i>
3:00 pm	S12-9	A manakin of many friends: unveiling the multi-male cooperative displays of the Swallow-tailed Manakin	<i>Manica LT, Schaedler LM, Ribeiro PHL; Universidade Federal do Paraná, Instituto Nacional de Pesquisas da Amazônia, Programa de Pós-graduação em Ecologia, Universidade Federal do Paraná, Programa de Pós-graduação em Zoologia</i>
4:00 pm	S12-10	Leks of <i>Tyrannus stolzmanni</i> provide insights into male aggregation	<i>Foster MS; Smithsonian Institution</i>
4:30 pm	S12-11	Genomics of sexually selected traits in an avian hybrid zone	<i>Lim HC, Bennett KFP, Justyn NM, Kingston SE, Long KM, Powers MJ, Brawn JD, Hill GE, Braun MJ; George Mason University, Smithsonian Institution, University of Maryland, Auburn University, University of Maine, University of Illinois Urbana-Champaign, University of Illinois Urbana-Champaign, Smithsonian Tropical Research Institute</i>
5:00 pm	S12-12	Manakin neurogenomics reveal the mechanisms underlying the evolution of skilled motor behavior	<i>Wirthlin M; Carnegie Mellon University</i>

Symposia and Special Sessions

6:00 pm	S12-13	Sexual selection on the behavioral, physiological, and genetic dynamics of an avian hybrid zone	<i>Long KM, Tobiansky DJ*, Goller F, Braun MJ, Brawn JD, Fuxjager MJ; University of Illinois Urbana-Champaign, Brown University, University of Münster, University of Utah, Smithsonian National Museum of Natural History, University of Maryland</i>
6:30 pm	S12-14	Sexual selection and its impacts on genome evolution: Insights from the Manakin Genomics Research Coordination Network	<i>Balakrishnan CN, Baldwin MW, Wirthlin M, Toda Y, Manakin RCN; East Carolina University, Max Planck Institute for Ornithology, Carnegie Mellon University, University of Tokyo</i>

1:00 PM – 2:00 PM Special Event

Can We Talk 2: “White Allies”

Moore K, Mehta R; University of Rhode Island, UC Santa Cruz

7:00 PM – 8:00 PM Special Event

Discussion on Allyship

Moore K, Mehta R; University of Rhode Island, UC Santa Cruz

Friday 26 February

12:00 PM – 2:30 PM Contributed Talk Session 48

Evolution and Biogeography of Islands: A Session in Honor of Dr. Vicki Funk

Chair: Chris Martine

12:00 pm	48-1	Welcome to the Special Session: An Introduction	<i>Martine CT; Bucknell University</i>
1:00 pm	48-2	Vicki Ann Funk (1947–2019), influential Smithsonian botanist	<i>Wagner W; Smithsonian Institution</i>
1:30 pm	48-3	New perspectives on the evolution of plant breeding systems in the radiation of Hawaiian Schiedea (Caryophyllaceae)	<i>McDonnell A, Moore M, Sakai AK, Weller SG, Wickett N; Chicago Botanic Garden, Oberlin College, University of California Irvine</i>
1:45 pm	48-4	Temperate Eurasian origins of Hawaiian Chenopodium (Amaranthaceae), plus description of a new subspecies endemic to Moloka'i	<i>Cantley JT, McDonnell AJ, Branson J, Kobara JR, Long S, Garnett W, Martine CT; San Francisco State University, Chicago Botanical Garden, Bucknell University, Wiliwili Native Plants</i>
2:00 pm	48-5	Archipelago-wide patterns of colonization and speciation among an endemic radiation of Galápagos land snails	<i>Phillips JG, Linscott TM, Rankin AR, Kraemer AC, Shoobs NF, Parent CE; University of Idaho</i>
2:15 pm	48-6	Reconstructing the history and biological consequences of a plant invasion on the Galapagos Islands	<i>Gibson MJS, Torres ML, Brandvain Y, Moyle LC; Indiana University, Universidad San Francisco de Quito, Galapagos Science Center, University of Minnesota-Twin Cities</i>
2:30 pm	48-7	Overview of the origin and evolution of compositae of Pacific Oceania	<i>Keeley SC, Funk VA, Cantley JT; University of Hawaii at Manoa, Smithsonian Institution, San Francisco State University</i>

Saturday 27 February

10:15 AM – 2:30 PM Contributed Talk Session 61

Honoring the Life and Legacy of Dr. George Gilchrist: Evology, Evolution, and Physiology

Chair: Martha Muñoz

10:15 am	61-1	Welcome to the Special Session: An introduction	<i>Muñoz MM; Yale University</i>
10:30 am	61-2	Overture for George Gilchrist	<i>Kingsolver JG; University of North Carolina Chapel Hill</i>
11:00 am	61-3	TrEnCh: Tools for translating environmental change into organismal responses	<i>Buckley LB; University of Washington</i>
11:15 am	61-4	Constraints on specialist butterfly species range shift responses to recent climate change	<i>Diamond S; Case Western Reserve University</i>

Symposia and Special Sessions

11:30 am	61-5	How will climate change affect the variance in fitness? An empirical test in the perennial herb <i>Mimulus cardinalis</i>	Muir CD, Sheth SN, Angert AL; University of Hawai'i, North Carolina State University, University of British Columbia
11:45 am	61-6	Morphological and performance consequences of hybridization between marine and land iguanas	Miles DB, Snell HL, Snell HM, Stone PA; Ohio University, University of New Mexico, University of Central Oklahoma
1:00 pm	61-8	Comparing thermal performance curves for metabolic rate, growth, and locomotion: evidence for tropical specialists and temperate generalists?	Ghalambor CK, Shah AA, Landeira-Dabarca A, Rugenski AT, Encalada AC, Thomas SA, Flecker AS, Poff NL; Norwegian University of Science and Technology, Colorado State University, University of Montana, Universidad San Francisco de Quito, University of Georgia, University of Nebraska, Cornell University
1:15 pm	61-9	Understanding phenotypic plasticity through the lens of George Gilchrist's many contributions to the field	Gunderson AR; Tulane University
1:30 pm	61-10	Selection on physiological plasticity and balanced polymorphisms during rapid invasions	Lee CE, Stern DB, Posavi M; University of Wisconsin Madison
1:45 pm	61-11	Shifts in the thermal performance curve across molecular, individual and population levels	El-Shesheny IA, Matoo OB, DeLong JP, Montooth KL*; Tanta University, University of Nebraska-Lincoln
2:00 pm	61-7	George Gilchrist: Program Officer	Scheiner SM; National Science Foundation
2:15 pm	61-13	George Gilchrist's sage advice on everything a new scholar should know	Sidlauskas BL, Botero C, Burleigh JG, Hazkani-Covo E, McGuire J, Meachen J, O'Meara BC, Roberts T, McClain C; Oregon State University, Washington University in Saint Louis, University of Florida, Open University of Israel, Georgia Institute of Technology, Des Moines University, University of Tennessee, Natural History Museum of Los Angeles County, Louisiana Universities Marine Consortium
2:30 pm	61-14	George Gilchrist – the <i>Drosophila</i> years	Huey RB; University of Washington Seattle
2:45 pm	61-15	Group discussion and toast	Muñoz MM; Yale University

Best Student Presentation Competition Sessions

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

Sunday 3 January

2:00 PM – 4:00 PM BSP 1

DAB Best Student Presentation: Marlene Zuk Award

Chair: Kendra Sewall

2:00 pm	BSP-1-1	Perinatal hormones and offspring dispersal in the ovoviparous <i>Sceloporus jarrovi</i> lizard	Manka-Worthington SE, Hews DK; Indiana State University
2:15 pm	BSP-1-2	The effect of hypoxia and turbidity on male courtship behavior	Williams BL, Gray SM, Pintor LM; Ohio State University
2:30 pm	BSP-1-3	Can you hear me now? Shoaling in a sensory-limited environment	LeFauve MK, Kawano SM, Hernandez LP; George Washington University
2:45 pm	BSP-1-4	Sociality confers energetic savings in a facultatively social bee	Ostwald MM, Fox TP, Harrison JF, Fewell JH; Arizona State University
3:00 pm	BSP-1-5	Some like it hot: Do female songbirds discriminate between songs produced under hot and cold temperatures?	Coomes CM, Derryberry EP; University of Tennessee Knoxville
3:15 pm	BSP-1-6	Bioluminescent backlighting illuminates the visual signals of a social squid in the deep sea	Burford BP, Robison BH; Stanford University, Monterey Bay Aquarium Research Institute
3:30 pm	BSP-1-7	Age-dependent genetic variation in aggression	Fortunato JA, Earley RL; University of Alabama
3:45 pm	BSP-1-8	Uncovering the bidirectional link between testosterone and aggression in a female songbird	George EM, Rosvall KA; Indiana University Bloomington

4:30 PM – 8:00 PM BSP 2

DCB Best Student Presentation: Mimi A.R. Koehl and Steven Wainwright Award; Gans Award Address

Chair: Stacey Combes

4:30 pm	BSP-2-1	Kinematics and hydrodynamics analyses of flapping-wing swimming in a penguin	Harada N, Oura T, Maeda M, Shen Y, Kikuchi DM, Tanaka H; Tokyo Institute of Technology, Royal Veterinary College
4:45 pm	BSP-2-2	The effects of skeletal muscle size on the tissue energy distribution and work output of 3D muscle during cyclic contractions	Ross SA, Dominguez S, Nigam N, Wakeling JM; Simon Fraser University
5:00 pm	BSP-2-3	The critical influence of head movements on wing steering responses in fly flight	Cellini B, Mongeau J-M; Pennsylvania State University
5:15 pm	BSP-2-4	A biomechanical paradox in the dual-function axial musculature of fish	Jimenez YE, Marsh RL, Brainerd EL; Brown University
5:30 pm	BSP-2-5	Aquatic locomotion in non-aquatic birds and the secondary evolution of subsurface swimming	Lapsansky AB, Tobalske BW; University of Montana
5:45 pm	BSP-2-6	Flying in an uncertain world: system identification of flight performance following wing damage in fruit flies	Salem W, Mongeau JM; Pennsylvania State University
6:00 pm	BSP-2-7	Kinematics of terrestrial walking in balitorid loaches	Crawford CH, Cerrato-Morales CL, Webber-Schultz AC, Hart PB, Randall ZS, Chakrabarty P, Page LM, Suvarnaksha A, Flammang BE; New Jersey Institute of Technology, Rutgers University, Louisiana State University, Florida Museum of Natural History, Maejo University
6:15 pm	BSP-2-8	All six degrees of freedom are essential to reconstructions of articular function	Manafzadeh AR, Gatesy SM; Brown University
7:00 pm	BSP-2-9	Gans Award Address: 'Constraint', a double-edged sword for evolution	Muñoz MM; Yale University

Best Student Presentations

2:00 PM – 4:00 PM BSP 3

DCE Best Student Presentation: Aubrey Gorbman Award

Chair: Kathleen Hunt

2:00 pm	BSP-3-1	Are glucocorticoids good indicators of condition across populations that vary in pollutant tolerance?	Shidemantle G, Buss N, Hua J; Binghamton University
2:15 pm	BSP-3-2	Using claws to compare reproduction, stress, and diet of female bearded and ringed seals in the Bering and Chukchi seas, Alaska, between 1953-1968 and 1998-2014	Crain DD, Karpovich S, Quakenbush L, Polasek L; Baylor University, Alaska Department of Fish and Game
2:30 pm	BSP-3-3	Testosterone implantation influences gut microbiome diversity, but not diet, in Red-backed Fairywrens	Khalil S, Houtz J, Welklin JF, Schwabl H, Karubian J; Tulane U, Cornell U, WSU
2:45 pm	BSP-3-4	Determining pregnancy status in an induced ovulating mustelid (<i>Mustela nigripes</i>)	Fowler KJ, Santymire RM, Brown JS; University of Illinois at Chicago, Lincoln Park Zoo, Moffitt Cancer Center
3:00 pm	BSP-3-5	The ecophysiology of tassel-eared squirrels and its relationship to food, weather, and reproduction	Zhang VY, Buck CL; Northern Arizona University
3:15 pm	BSP-3-6	Effects of atrazine on the gonads and vocal behavior of <i>Silurana tropicalis</i>	Ferguson QR, Leininger EC; New College of Florida
3:30 pm	BSP-3-7	Yolk fatty acids, but not androgens, predict offspring fitness in wild birds	Mentesana L, Andersson MN, Casagrande S, Goymann W, Isaksson C, Hau M; Max Planck Institute for Ornithology, Lund University
3:45 pm	BSP-3-8	Response of the thyroid axis and appetite-regulating peptides to fasting and overfeeding in goldfish, <i>Carassius auratus</i>	Deal CK, Volkoff H; Memorial University of Newfoundland

2:00 PM – 4:00 PM BSP 4

DEDB Best Student Presentation

Chair: Deirdre Lyons

2:00 pm	BSP-4-1	Straw, sticks, and bricks: Genome duplication and the evolution of fibrillar collagens in the vertebrate musculoskeletal system	Root ZD, Allen C, Brewer M, Gould C, Medeiros DM; University of Colorado Boulder
2:15 pm	BSP-4-2	A conserved transcriptional program underlies mesoderm- and neural crest-derived chondrocytes	Gomez-Picos P, Ovens K, Eames BF; University of Saskatchewan
2:30 pm	BSP-4-3	Pisiform reduction in hominoids and sloths: phenotypic convergence through developmental diversity	Gavazzi LM, Kjosness KM, Reno PL; Kent State University, NEOMED, Philadelphia College of Osteopathic Medicine
2:45 pm	BSP-4-4	Development of the amphiblastula of the calcareous sponge <i>Sycon coactum</i>	Verstraete CJ, Leys SP; University of Alberta
3:00 pm	BSP-4-5	Comparing nervous system development and regeneration in the acoel <i>Hofstenia miamia</i>	Hulett RE, Loubet-Seneor K, Kimura JO, Srivastava M; Harvard University
3:15 pm	BSP-4-6	The acoel <i>Convolutrilba longifissura</i> fuels up for regeneration through its algal symbionts	Nanes Sarfati D, Xue Y, Byrne AL, Le D, Darmanis S, Sikes J, Wang B; Stanford University, Chan Zuckerberg Biohub, University of San Francisco
3:30 pm	BSP-4-7	How do arachnids make antennae out of legs? An evo-devo approach in whip spiders (<i>Amblypygi</i>)	Gainett G, Sharma PP; University of Wisconsin-Madison
3:45 pm	BSP-4-8	Comparative histology of developing sutures in the chicken skull with implications for the homology of the frontal bone	Arnaut B, Lantigua KE, Mackenzie EM, McKinnell IW, Maddin HC; Carleton University

Best Student Presentations

4:30 PM – 6:30 PM BSP 5

DEDE Best Student Presentation

Chair: Laura Zimmerman

4:30 pm	BSP-5-1	Can parasite aggregation stabilize host-parasite populations? Linking individual parasite behaviour to population dynamics	Ramesh A, Jones T, Dorleans R, Totaro L, Bashey F; Indiana University
4:45 pm	BSP-5-2	Early viral immune challenge alters adult behavioral phenotype in the zebra finch (<i>Taeniopygia guttata</i>)	Williams SG, Grindstaff JL; Oklahoma State University
5:00 pm	BSP-5-3	Drivers of parasite abundance: Environmental vs host effects	Vasquez D, Park AW; University of Georgia
5:15 pm	BSP-5-4	Completing the life cycle of QPX: evidence of zoospores and description of a new replication pathway	Brianik CJ, Geraci-Yee S, Collier J, Allam B; Stony brook university
5:30 pm	BSP-5-5	Transcriptome analysis of five coral species infected with Scleractinian Coral Tissue Loss Disease	Beavers K, Meiling S, MacKnight N, Dimos B, Brandt M, Mydlarz L; University of Texas at Arlington, University of the Virgin Islands
5:45 pm	BSP-5-6	Exploring the cloacal microbiome and fitness correlates in female tree swallows	Hernandez J, Belden LK, Moore IT; Virginia Tech
6:00 pm	BSP-5-7	A feature-based analysis of <i>Bombus</i> gut microbiomes and <i>C. bombi</i> infection	Young M, Lee J, Just F, Angelini D; Colby College
6:15 pm	BSP-5-8	Microbial diversity and flexibility are associated with lay date in a wild songbird	Houtz JL, Taff CC, Vitousek MN; Cornell University

2:00 PM – 4:00 PM BSP 6

DEE Best Student Presentation: Huey Award

Chair: Christine Miller

2:00 pm	BSP-6-1	Reduced endurance and mitochondrial respiration in hybrid asexual lizards (genus: <i>Aspidoscelis</i>)	Klabacka RL, Parry HA, Yap KN, Cook RA, Heron TA, Horne LM, Maldonado JA, Oaks JR, Kavazis AN, Fujita MK, Schwartz TS; Auburn University, Villanova University, University of Missouri, University of Texas at El Paso, University of Texas at Arlington
2:15 pm	BSP-6-2	The environmental drivers of variation in <i>Junco</i> physiological flexibility	Stager M, Senner NR, Swanson DL, Cheviron ZA; University of South Carolina, University of South Dakota, University of Montana
2:30 pm	BSP-6-3	Developmental temperatures differentially affect survival across life stages	Pruett JE, Warner DA; Auburn University
2:45 pm	BSP-6-4	Why are box jellyfish so toxic? Phylogenetic and selection analysis of an expanded family of putatively pore-forming jellyfish toxins across medusozoans (Cnidaria: Medusozoa)	Klumpen AML, Kayal E, Collins AG, Cartwright P; University of Kansas, Station Biologique, Smithsonian Institution
3:00 pm	BSP-6-5	How tradeoffs constrain evolvability at the range limit of the Trinidadian guppy	Mauro AM, Torres-Dowdall J, Marshall CA, Ghalambor CK; Colorado State University, University of Konstanz, Norwegian University of Science and Technology
3:15 pm	BSP-6-6	Reproductive consequences of environmental stress in a Hawaiian coral reef fish	Tran LL, Johansen JL; University of Hawai'i at Manoa
3:30 pm	BSP-6-7	Historical forest stability shapes contemporary patterns of afrobatrachian frog diversity in central africa	Jongsma GFM, Barve N, Allen JM, Blackburn DC; Florida Museum of Natural History, University of Florida, University of Nevada Reno
3:45 pm	BSP-6-8	A tale of three inks: Comparison of free amino acid composition of ink from california sea hares, common cuttlefish, and pygmy sperm whales	Simonitis LE, Gahn MB, Kaiser K, Plön S, McLellan WA, Marshall CD; Texas A&M University at Galveston, Bayworld Centre for Research and Education (BCRE), University of North Carolina Wilmington

Best Student Presentations

4:30 PM – 7:15 PM BSP 7

DIZ Best Student Presentation: Mary Rice Award

Chair: Kenneth Halanynch

4:30 pm	BSP-7-1	Venom and social behavior: using spiders to evaluate the evolution of sociality under high risk conditions	Gatch L, Stein L; University of Oklahoma
5:00 pm	BSP-7-3	A living shag rug: Sea urchin spine density differs by habitat and has consequences for vision	Notar JC, Meja B, Johnsen S; Duke University
5:15 pm	BSP-7-4	Identification of Photosymbiosis-related genes in marine cockles (Subfamily Fraginae)	Li R, Zarate D, Avila-Magaña V, Li J; University of Colorado Boulder
5:30 pm	BSP-7-5	Biomechanical role of dorsal thoracic spine in swimming of barnacle nauplii	Branam E, Wong JY, Xu K, Chan BKK, Koehl MAR, Chan KYK; Swarthmore College, Academia Sinica, University of California Berkeley
6:00 pm	BSP-7-6	Environmental predictability: a missing link in ocean acidification sensitivity research	Rojas M, Chan KYK; Swarthmore College
6:15 pm	BSP-7-7	Large effect of small temperature changes on embryonic development of Antarctic invertebrates	Robert GT, Toh MWA, Moran AL; University of Hawai'i at Manoa
4:45 pm	BSP-7-8	On the hormonal control of regeneration and reproduction in <i>Pristina leidyi</i> (Annelida)	Del Olmo I, Álvarez-Campos P; Universidad Autónoma de Madrid
6:45 pm	BSP-7-9	3-D culture of marine sponge cells: comparison of methods	Urban-Gedamke E, Conkling M, McCarthy PJ, Wills PS, Pomponi SA; Florida Atlantic University, Harbor Branch Oceanographic Institute
7:00 pm	BSP-7-10	A sponge cell culture biobank for habitat restoration, biotechnology applications, and pharmaceutical development	Conkling M, Pomponi SA; Harbor Branch Oceanographic Institute, Florida Atlantic University

4:30 PM – 7:15 PM BSP 8

DNNSB Best Student Presentation

Chair: Mike Baltzley

4:30 pm	BSP-8-1	Dragonfly wing mechanosensation	Yarger AM, Kluge J, Siwanowicz I, Lin HT; Imperial College London
4:45 pm	BSP-8-2	How do mosquitoes escape visual threats?	Wynne NE, Chandrasegaran K, Vinauger C; Virginia Polytechnic Institute and State University
5:00 pm	BSP-8-3	Endocrine modulation of retinal sensitivity in <i>Hyla cinerea</i>	Walkowski WG, Santana A, Gaston T, Gordon WC, Bazan NG, Farris H; Louisiana State University Health Sciences Center
5:15 pm	BSP-8-4	Decision-making in a social world: sex and status differences in cognition in the cichlid fish <i>Astatotilapia burtoni</i>	Wallace KJ, Hofmann HA; University of Texas at Austin
5:30 pm	BSP-8-5	Epigenetic regulation of the VIP gene in a polymorphic songbird	Prichard MR, Merritt JR, Root J, Grogan KE, Maney DL; Emory University
6:00 pm	BSP-8-6	Discovery of a highly-conserved behavioral role for an interneuron neuropeptide receptor	Chai CM, Wen C, Wong WR, Park HN, Cohen SM, Sternberg PW; Caltech
6:15 pm	BSP-8-7	Visual physiology of larval stomatopod crustaceans	McDonald MS, Cohen JH, Porter ML; University of Hawai'i at Manoa, University of Delaware
6:30 pm	BSP-8-8	Directional hearing in salamanders	Capshaw G, Soares D, Christensen-Dalsgaard J, Carr CE; University of Maryland College Park, New Jersey Institute of Technology, University of Southern Denmark
6:45 pm	BSP-8-9	Role of nesfatin-1 in energetic state and maternal mouthbrooding in a cichlid	Chugh S, Maruska K; Louisiana State University
7:00 pm	BSP-8-10	Getting nature inside the lab using virtual reality	Kaushik PK, Renz M, Olsson SB; National Centre for Biological Sciences, Universität Bielefeld

Best Student Presentations

2:00 PM – 3:15 PM BSP 9

DOB Best Student Presentation: Rising Star in Organismal Botany Award

Chair: Chris Martine

2:00 pm	BSP-9-1	Granivory impacts on the Pennsylvania threatened species <i>Baptisia australis</i> var. <i>australis</i> (Fabaceae)	Moore CL, McDonnell AJ, Schuette S, Martine CT; University of Pittsburgh, Chicago Botanic Garden, Western Pennsylvania Conservancy, Bucknell University
2:15 pm	BSP-9-2	Resolving relationships within the genus <i>Amorpha</i> using whole chloroplast genomes	MacNeill BN, Straub SK, Ivey EP, Brewer KZ, McKain MR; University of Alabama, Hobart and William Smith Colleges
2:30 pm	BSP-9-3	Phylogenomics of the rock daisies (Perityleae; Compositae) provides new perspectives on the evolution of fruit and flower traits	Lichter Marck IH, Freyman WA, Siniscalchi CM, Mandel JR, Castro-Castro A, Johnson G, Baldwin BG; UC Berkeley, Smithsonian Institution
2:45 pm	BSP-9-4	Rapid evolution of leaf characteristics in response to drought stress in populations of scarlet monkeyflower (<i>Mimulus cardinalis</i>)	Branch HA, Moxley DR, Anstett DN, Angert AL; University of British Columbia
3:00 pm	BSP-9-5	Structural organization of the spongy mesophyll in laminar leaves with reticulate venation	Borsuk AM, Roddy AB, Theroux-Rancourt G, Brodersen CR; Yale School of the Environment, Florida International University, University of Natural Resources and Life Sciences

4:30 PM – 6:15 PM BSP 10

DPCB Best Student Presentation: Wake Award

Chair: David Blackburn

4:30 pm	BSP-10-1	Comparative analysis of cephalopod mitochondrial genomes reveals rapid sequence convergence across replicated genes or control regions within individuals	Rosales K, Edsinger E; Salk Institute
4:45 pm	BSP-10-2	Biology-guided neural network for species classification	Elhamod M, Maruf MA, Mandke PK, Karpatne A; Virginia Tech
5:00 pm	BSP-10-3	Evolution of non-visual opsin genes across life history transitions in frogs	Boyette JL, Bell RC, Fujita MK, Thomas KN, Streicher JW, Gower DJ, Schott RK; Berry College, California Academy of Sciences, University of Texas Arlington, Natural History Museum, National Museum of Natural History
5:15 pm	BSP-10-4	The evolution of bold color patterns across teleost fishes	Zapfe KL, Hodge JR, Larouche O, Friedman ST, Wainwright PC, Price SA; Clemson University, Rice University, Yale University, University of California Davis
5:30 pm	BSP-10-5	Convergent evolution of an elaborate display behavior in frogs is associated with similar changes to the androgen hormone system	Anderson NK, Schuppe ER, Gururaja KV, Hebbar P, Mangiamela LA, Cusi Martinez JC, von May R, Preininger D, Fuxjager MJ; Brown University, Cornell University, Indian Institute of Science, Srishti Institute of Art, Design and Technology, Smith College, Universidad Nacional Mayor de San Marcos, California State University Channel Islands, University of Vienna
5:45 pm	BSP-10-6	Evaluation of body size and shape variation across latitude in teleost fishes	Camper BT, Friedman ST, Wainwright PC, Price SA; Clemson University, University of California Davis
6:00 pm	BSP-10-8	How to get high: Positive selection on mitochondrial genes in high-elevation species	Iverson ENK, Havird JC; University of Texas at Austin
6:15 pm	BSP-10-9	It's not just a phase: evolutionary and functional consequences of sexually dimorphic color pattern diversity in labrid fishes	Karan EA, Schwartz ST, Perillo M, Alfaro ME; University of California Los Angeles

Best Student Presentations

2:00 PM – 4:00 PM BSP 11

DVM Best Student Presentation: D. Dwight Davis Award

Chair: Patricia Hernandez

2:00 pm	BSP-11-1	Limbs, shoulders, necks, and trunks: A search for the neck-trunk boundary in snakes using a comparative anatomical study of legless lizards	<i>Koeller KL; University of Florida</i>
2:15 pm	BSP-11-2	Investigating serial homology of the adhesive structures of diplodactylid lizards (Reptilia: Gekkota)	<i>Griffing AH, Sanger TJ, Gamble T; Marquette University, Loyola University in Chicago</i>
2:30 pm	BSP-11-3	Not to be flip: Anatomy and novel tendon morphology of the California sea lion hindflipper	<i>Leahy AM, Fish FE; West Chester University</i>
2:45 pm	BSP-11-4	New methods support the possibility of a salamander-like walk in the Permian tetrapod Eryops	<i>Herbst EC, Eberhard E, Manafzadeh AR, Richards C, Hutchinson JR; University of Zurich, EPFL, Brown University, Royal Veterinary College</i>
3:00 pm	BSP-11-5	Influences on cranial morphology in whales: Investigating the evolutionary history and diversity of the cetacean skull	<i>Coombs E, Clavel J, Felice R, Bennion R, Beatty B, Goswami A, Park T, Churchill M, Geisler J; University College London, Université Claude Bernard, University of Liège, New York Institute of Technology, Natural History Museum, University of Wisconsin-Oshkosh</i>
3:15 pm	BSP-11-6	Exploring the evolution of the tetrapod limb musculature by studying its embryology	<i>Smith Paredes D, Vergara ME, Stundl J, Moses MM, Behringer RR, Cerny R, Bhullar BAS; Yale University, CalTech, University of Texas, Charles University</i>
3:30 pm	BSP-11-7	Stick with it: convergent evolution of eco-morphotypes in clingfishes	<i>Huie JM, Hall KC, Summers AP, Conway KW; George Washington University, University of Washington, Texas A&M University</i>
3:45 pm	BSP-11-8	Do the cells in stingray mineralized cartilage perform the roles of bone cells? Quantitative analysis of the lacuno-canalicular network in stingray tesserae	<i>Chamel J, Schotte M, Bizzarro JJ, Zaslansky P, Fratzl P, Baum D, Dean MN; MPIKG, ZUSE, University of California, Charité Hospital</i>

Contributed Talk Sessions

All contributed talks and posters for SICB 2021 were pre-recorded and uploaded the SICB Pathable platform. They are available “on demand” to registered attendees from Jan 3-Feb 28.

Session 1	Complementary to S1: Blinded by the Light: Effects of Light Pollution Across Diverse Natural Systems
Session 2	Complementary to S2: Genomic Perspectives in Comparative Physiology of Mollusks: Integration Across Disciplines
Session 3	Complementary to S3: Physical Mechanisms of Behavior (Foraging)
Session 4	Complementary to S3: Physical Mechanisms of Behavior (Locomotion)
Session 5	Complementary to S3: Physical Mechanisms of Behavior (Sociality)
Session 6	Complementary to S4: Biology Beyond the Classroom: Experiential Learning Through Authentic Research, Design, and Community Engagement
Session 7	Complementary to S5: An Evolutionary Tail: Evo-devo, Structure, and Function of Post-anal Appendages
Session 8	Complementary to S6: Spatiotemporal Dynamics of Animal Communication
Session 9	Complementary to S7: The Integrative Biology of Pigment Organelles
Session 10	Complementary to S8: The Biology of Sticky: Adhesive Silk, Fiber, and Glue Biomaterials Across Eukaryota
Session 11	Complementary to S9: Sending and Receiving Signals: Endocrine Modulation of Social Communication
Session 12	Complementary to S10: Metachronal Coordination of Multiple Appendages for Swimming and Pumping I
Session 13	Complementary to S10: Metachronal Coordination of Multiple Appendages for Swimming and Pumping II
Session 14	Complementary to S11: Biology's Best Friend: Bridging Disciplinary Gaps to Advance Canine Science I
Session 15	Complementary to S11: Biology's Best Friend: Bridging Disciplinary Gaps to Advance Canine Science II
Session 16	Complementary to S12: Manakin Genomics: Comparative Studies of Evolution and Behavior in a Unique Clade of Birds
Session 17	Adaptation
Session 18	Aggregations & Migrations
Session 19	Animal Communication
Session 20	Anthropogenic and Urban influence on Behavior I
Session 21	Anthropogenic and Urban influence on Behavior II
Session 22	Biological Materials: (Ultra)Structure & Function I
Session 23	Biological Materials: (Ultra)Structure & Function II
Session 24	Biomimetics & Robotics
Session 25	Bone Structure: Ecology & Phylogeny
Session 26	Cellular and Molecular Physiology
Session 27	Climate Change and Species Interactions
Session 28	Community Ecology and Biodiversity
Session 29	Comparative Genomics
Session 30	Comparative, Environmental & Behavioral Endocrinology
Session 31	Conservation Biology
Session 32	Coral Reef Biology
Session 33	Coral Reefs and Climate Change
Session 34	Determinants of Metabolic Rate
Session 35	Development of Behavior
Session 36	Disparity and Diversification
Session 37	Eco-Evo-Devo & Life-History Transitions
Session 38	Ecomorphology I
Session 39	Ecomorphology II
Session 40	Ecomorphology III
Session 41	Education
Session 42	Endocrine Stress I
Session 43	Endocrine Stress II
Session 44	Endocrinology: Reproduction, Growth & Development
Session 45	Energetics
Session 46	Environmental Effects on Physiology
Session 47	Evo-Devo: Deep Homology
Session 49	Evolution of Behavior
Session 50	Evolutionary Developmental Genetics
Session 51	Evolutionary Ecology
Session 52	Evolutionary Morphology
Session 53	Evolutionary Physiology

Session 54	Fish Feeding I
Session 55	Fish Feeding II
Session 56	Flight Dynamics & Mechanics
Session 57	Foraging Behavior and Predator/Prey
Session 58	Foraging Behavior
Session 59	Global Change and Population Ecology
Session 60	Gut Microbiomes
Session 62	Hosts, parasites & pathogens: ecology and evolution
Session 63	Immune-based Trade-offs
Session 64	Immunity
Session 65	Impact of Climate Change on Physiology
Session 66	Insect Wing Structure-Function
Session 67	Larval Ecology
Session 68	Life History and Mating Systems
Session 69	Life in Moving Fluids I
Session 70	Life in Moving Fluids II
Session 71	Limb Biomechanics
Session 72	Locomotion: Body Stiffness & Posture
Session 73	Locomotion: Challenges & Obstacles
Session 74	Locomotion: Climbing & Complex Terrain
Session 75	Locomotion: Gaits & Gait Changes
Session 76	Microbiomes: More Than Guts
Session 77	Molecular Evolution
Session 78	Movement, Migration and Dispersal Behaviors I
Session 79	Movement, Migration and Dispersal Behaviors II
Session 80	Muscle-Tendon Structure-Function
Session 81	Neuroanatomy and Neurobiology
Session 82	Neuroethology
Session 83	Osmoregulation
Session 84	Parental Care
Session 85	Phenotypic Plasticity
Session 86	Photosynthesis, Respiration, and Ventilation
Session 87	Phylogenetics
Session 88	Physiology of Immunity and Reproduction
Session 89	Plasticity, Epigenetics, Stress, and Novelty
Session 90	Pollution and Ecotoxicology
Session 91	Population Genetics and Phylogeography
Session 92	Reproduction
Session 93	Sensory Biology and Neuroethology
Session 94	Sensory Biology I
Session 95	Sensory Biology II
Session 96	Sensory Ecology
Session 97	Sensory Structure-Function
Session 98	Skull & Jaw Functional Morphology & Evolution
Session 99	Social Behavior I
Session 100	Social Behavior II
Session 101	Species Distributions in the Anthropocene
Session 102	Spines & Sutures
Session 103	Structure-Function of Habitat Transitions
Session 104	Suckling, Swallowing & Chewing
Session 105	Swimming: Maneuvering & Stability
Session 106	Symbiosis and Immunity
Session 107	Temperature and Metabolism
Session 108	Thermobiology
Session 109	Thermoregulation
Session 110	(Un)Correlated Evolution
Session 111	Vertebrate Evo-Devo

Contributed Talk Sessions

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

Session 1

Complementary to S1: Blinded by the Light: Effects of Light Pollution Across Diverse Natural Systems

Chair: *Valentina Alaasam*

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| 1-1 | Cold nights, city lights: Artificial light at night reduces photoperiodically induced diapause in urban and rural populations of <i>Aedes albopictus</i> | Westby KM, Medley KA; Washington University in Saint Louis |
| 1-2 | Urbanization masks natural cues of light, noise, and temperature that affect evening cricket chorus | Hopkins GR, Elgar MA, Gaston KJ, Visser ME, Jones TM; Western Oregon University, University of Melbourne, University of Exeter, Netherlands Institute of Ecology |
| 1-3 | Blinded by darkness and contaminants: Impacts of multiple, interacting pollutants on visual behavior during early development | Suriyampola PS, Lopez M, Suárez-Rodríguez M, Ellsworth BE, Conroy-Ben O, Martins EP; Arizona State University |
| 1-4 | Festival of lights: The ecological benefits of monochromatic illumination vary by insect taxon | Owens ACS, Lewis SM; Tufts University |
| 1-5 | Moth Survival Increases Under High Pressure Sodium Lights | Seymoure BM, Parrish T, Egan K, Irwin D, Crooks K, Angeloni L; Washington University, Colorado State University |
| 1-6 | A seabird's eye view of artificial light and the moon | Moon HE, Porter ML; University of Hawai'i at Mānoa |
| 1-7 | Measuring light pollution and its impact across the National Park Service | White JM; National Park Service |
| 1-8 | The effects of artificial light on nesting and feeding behaviors in eastern bluebirds and tree swallows | Utt DJ, Foltz SL; Radford University |
| 1-9 | Finding dark routes: A migrating nocturnal bird avoids artificial light during both travel and stopovers | Korpach AM, Garroway CJ, Mills AM, von Zuben V, Davy CM, Fraser KC; University of Manitoba, York University, Ontario Ministry of Natural Resources and Forestry |
| 1-10 | Do ground-based, downward-facing artificial lights affect the flight behavior of nocturnally migrating birds? | Cabrera-Cruz SA, Larkin RP, Gimpel ME, Gruber JG, Buler JJ; University of Delaware, University of Illinois, Washington College |
| 1-11 | Tolerant toadlets: anthropogenic noise and light pollution increases feeding efficiency in juvenile common toads (<i>Bufo bufo</i>) | Ujhegyi N, Bombay B, Bókonyi V; Plant Protection Institute, Centre for Agricultural Research, Pangea Cultural and Environmental Association |
| 1-12 | Seeing lizards in a new light: How does artificial light at night impact anoles? | Thawley CJ, Kolbe JJ; Neumann University, University of Rhode Island |

Session 2

Complementary to S2: Genomic Perspectives in Comparative Physiology of Mollusks: Integration Across Disciplines

Chair: *Maurine Neiman*

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| 2-1 | Neuroendocrine regulation of the metamorphic transition in the giant clam, <i>Hippopus hippopus</i> | Tan KP, Degnan SM, Conaco CG; University of the Philippines, University of Queensland |
| 2-2 | Evolve and resequence for egg size in a sea slug with striking life-history plasticity | Caplins SA; University of California Davis |
| 2-3 | Comparative phylogenomics reveal complex evolution of life history strategies in a clade of bivalves with parasitic larvae (<i>Bivalvia</i> : Unionoida: Ambleminae) | Smith CH, Pfeiffer JM, Johnson NA; University of Texas Austin, Smithsonian Institution, U.S. Geological Survey, Wetland and Aquatic Research Center |
| 2-4 | Evolution in <i>Sinocyclocheilus</i> cavefish is marked by rate shifts, reversals, and origin of novel traits | Mao TR, Liu YW, Meegaskumbura M*, Ellepola G, Fu CH, Gross JB, Pie MR; Guangxi University, University of Cincinnati, Universidade Federal do Paraná |
| 2-5 | Identifying molecular markers associated with resilience to ocean acidification in the eastern oyster | Schwaner C, Farhat S, Tanguy A, Boutet I, Barbosa M, Pales Espinosa E, Allam B; Stony Brook University, Station Biologique de Roscoff |
| 2-6 | Chitons on the cutting edge: the biomineralization of iron-clad teeth in <i>Acanthopleura granulata</i> | Varney RM, Speiser DI, Kingston ACN, Kocot KM; University of Alabama, University of South Carolina, University of Tulsa |

Contributed Talks

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| 2-7 | The bilaterian ancestor possessed a complex apoptosis genetic toolkit that was subsequently dismantled in ecdysozoans but preserved in lophotrochozoans and deuterostomes | Plachetzki DC, Pankey MS, MacManes MD, Lesser ML, Walker CW; University of New Hampshire |
| 2-8 | High thermal tolerance, but not its plasticity, driven by habitat temperature and genotype in an intertidal sea hare | Tanner RL, Bowie RCK, Wang-Claypool C, Stillman JH; University of California Davis, University of California Berkeley, San Francisco State University |
| 2-9 | Thermal tolerance in the <i>Mytilus</i> species complex across multiple levels of biological organization | Schwartz LC, Truebano M, Strong EE, Hilbish TJ, González VL; University of South Carolina at Columbia, University of Plymouth, Smithsonian Institution |
| 2-10 | Exploring the tolerance of Pacific geoduck to low pH through comparative physiology, genomics, and DNA methylation | Trigg SA, Putnam HM, Gurr SJ, Mitchell KR, Vadopalas B, Roberts SB; University of Washington, University of Rhode Island |
| 2-11 | Influence of ocean acidification on Pacific oyster (<i>Crassostrea gigas</i>) DNA methylation | Venkataraman YR, Roberts SB; University of Washington |
| 2-12 | Environmental learning' in a tolerant commercial clam; Insights from phenotypic and subcellular adjustments to hypercapnic seawater | Gurr SJ, Trigg SA, Vadopalas B, Roberts SB, Putnam HM; University of Rhode Island, University of Washington |
| 2-13 | Physiological and genomic variation among cryptic species of a marsh snail (<i>Melampus bidentatus</i>) | Dennis AB, Inaebnit T; University of Potsdam |
| 2-14 | The mitochondrial genome of <i>Melampus bidentatus</i> (Panpulmonata, Ellobioidea) | Inäbnit T, Dennis A; University of Potsdam |

Session 3

Complementary to S3: Physical Mechanisms of Behavior (Foraging)

Chair: Alejo Rico-Guevara

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| 3-1 | Trap morphology in the carnivorous plant genus <i>Utricularia</i> | Mordvinov Y, Peters KD, Gonzalez MS, Müller UK, Reece JS; CSU Fresno |
| 3-2 | Integrating tooth shape with strike mechanics in the process of prey capture in <i>Boa constrictor</i> | Ryerson WG, Van Valkenburg T; Saint Anselm College |
| 3-3 | Reassessing hummingbird foraging: Is there a territoriality-traplining continuum? | Sargent AJ, Rico-Guevara A, Groom DJE; University of Washington |
| 3-4 | For slow red lionfish, persistence and distance matter when pursuing fast prey | Peterson AN, McHenry MJ; University of California Irvine |
| 3-5 | Minimum requirements for an effective web in the grass spider <i>Agelenopsis pennsylvanica</i> | Spagna JC, Lewin D; William Paterson University |
| 3-6 | No trick anthers: buzz pollination behavior is elicited, but likely not manipulated, by anther chemical cues | Mosher A, Papaj D, Buchmann S, Eltz T, Russell A; Missouri State University, University of Arizona, University of Bochum |
| 3-7 | Does eye morphology predict predator avoidance behavior in the Carolina grasshopper (<i>Dissosteira carolina</i>)? | Brandley NC, Gilbert FR; College of Wooster |

Session 4

Complementary to S3: Physical Mechanisms of Behavior (Locomotion)

Chair: Alejo Rico-Guevara

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| 4-1 | Remoras pick where they stick on blue whales | Flammang BE, Marras S, Anderson EJ, Lehmkuhl O, Mukherjee A, Cade DE, Beckert M, Nadler JH, Houzeaux G, Vázquez M, Amplo HE, Calambokidis J, Friedlaender A, Goldbogen JA; NJIT, Rutgers University, Woods Hole Oceanographic Institution, Barcelona Supercomputing Center, Stanford University, Georgia Tech Research Institute, University of California Santa Cruz |
| 4-2 | Tokay geckos (<i>Gekkonidae</i> : <i>Gekko gecko</i>) preferentially use substrates that elicit maximal adhesive performance | Garner AM, Pamfilie AM, Dhinojwala A, Niewiarowski PH; University of Akron |
| 4-3 | Laboratory studies of burrowing locomotion in nematodes | Pierce CJ, Sun G, Lu H, Goldman DI; Georgia Institute of Technology |
| 4-4 | Unpredictable hummingbirds: Flight path entropy is constrained by speed and wing loading | Berberi I, Segre PS, Altshuler DL, Dakin R; Carleton University, Stanford University, University of British Columbia |
| 4-5 | Tardigrade stepping pattern is robust to changes in orientation and substrate | Nirody JA, Duran Rosario LA, Johnston D, Cohen DJ; Rockefeller University and University of Oxford, Princeton University |

Contributed Talks

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| 4-6 | Uncovering the role of head flexion during beam obstacle traversal of cockroaches | Wang Y, Othayoth R, Li C; Johns Hopkins University |
| 4-7 | Spotted lanternfly nymphs stick the landing using multiple self-righting behaviors | Kane SA, Bien T, Contreras-Orendain L, Ochs MF, Hsieh ST*; Haverford College, College of New Jersey, Temple University |
| 4-8 | Reffling: a novel locomotor behavior used by Neotropical armored catfishes (Loricariidae) in terrestrial environments | Bressman NR, Morrison CH, Ashley-Ross MA; Chapman University, Wake Forest University |

Session 5

Complementary to S3: Physical Mechanisms of Behavior (Sociality)

Chair: Patrick Green

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| 5-1 | Wingbeat synchronization in Mexican free-tailed bats (<i>Tadarida brasiliensis</i>) | Fullerton JA, Weesner AT, Bentley I, Kloepper LN; Saint Mary's College |
| 5-2 | Adult nutrition affects the defensive performance of an insect weapon | Miller CW, Emberts Z, Chen S, Wilner D, Woodman TE, Federle W; University Florida, University Cambridge |
| 5-3 | The origin and rapid spread of evolutionary novelty: characterizing song and wing variation in two newly discovered cricket morphs | Gallagher JH, Zonana DM, Broder ED, Tinghitella RM; University of Denver, Saint Ambrose University |
| 5-4 | What is it like to be a bat: the physics of flight during high-speed roost re-entry in the Mexican free-tailed bat (<i>Tadarida brasiliensis</i>) | Kloepper LN, Bentley I, Harding C, Taylor GK; Saint Mary's College, Oxford University |
| 5-5 | Baffling behavior: why don't more crickets use acoustic tools? | Brandt EE, Duke S, Wang L, Mhatre N; University of Western Ontario |
| 5-6 | Behavioral control of morphology in Cypridae | Levy MG; University of California Berkeley |
| 5-7 | Mechanosensory signaling during reproductive interactions in fishes | TerMarsch H, Ward JL*; Ball State University |
| 5-8 | Can size and performance tell us different stories about the role of animal weapons during fights? | Palaoro AV, Peixoto PEC; Federal University of São Paulo, Federal Univeristy of Minas Gerais |
| 5-9 | Nest substrate and tool shape significantly affect mechanics and energy requirements of avian eggshell puncture | Clark DL, Hauber ME, Anderson PSL; University of Illinois at Urbana-Champaign |

Session 6

Complementary to S4: Biology Beyond the Classroom: Experiential Learning Through Authentic Research, Design, and Community Engagement

Chair: Patrice Connors

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| 6-1 | Using zoos and webcams to incorporate research into an undergraduate animal behavior course | Davis-Berg EC, Rafacz ML; Columbia College Chicago |
| 6-2 | How Integrative is your Animal Behavior? | Renn SCP, Zornik E; Reed College |
| 6-3 | Decolonizing through interdisciplinarity: roots-based integration | Chase HT; University of Montana |
| 6-4 | Conducting authentic curriculum undergraduate research experiences (ACUREs) in teaching laboratories | Buendia Castillo D, Stanley C, Naidugari J, McCubbin S, Nethery B, Dupont-Versteegden E, Cooper R L; University of Kentucky |
| 6-5 | Conservation technology through multidisciplinary undergraduate teams | Schulz A, Seleb B, Wallace R, Hu D; Georgia Tech, Georgia Tech Research Institute |
| 6-6 | Follow the college student: The Florida Urban Microbiome Project | Collins S, Zidek J, Flower N, Moore M, Lambie J, Thurmond J, Oberle B, Diaz-Almeyda E; New College of Florida |

Session 7

Complementary to S5: An Evolutionary Tail: Evo-devo, Structure, and Function of Post-anal Appendages

Chair: Janneke Schwaner

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| 7-1 | Body and tail undulation measured and emulated by soft sensors provides insight on stiffness control through co-contraction | Lin YH, Siddall R, Banerjee H, Schwab F*, Jusufi A; Max Planck Institute for Intelligent Systems |
| 7-2 | The effect of tail autotomy on prey capture performance in <i>Coleonyx variegatus</i> geckos | Vollin MF, Higham TE; University of California Riverside |

Contributed Talks

7-3	Markerless automated kinematic tracking of wild birds in agonistic flights	Swinsky CM, Hastings BT, Jackson BE; Longwood University, George Mason University
7-4	Comparative biomechanics of lizard tails during level walking and vertical climbing	Schultz JT, Cieri RL, Proost T, Clemente CJ; University of the Sunshine Coast, CSIRO
7-5	A Tail of Four Fishes: An analysis of kinematics and material properties of elongate fishes	Naughton LF, Kruppert S, Jackson B, Porter ME, Donatelli CM; Bucknell University, University of Washington Friday Harbor Labs, Idaho State University, Florida Atlantic University, University of Ottawa
7-6	Caudal and column changes: tail and vertebral spine adaptations in amphibious cyprinodontiformes	Giammona FF, Minicozzi M, Ashley-Ross MA; Wake Forest University, Minnesota State University
7-8	Serotonylated proteins in spermatozoa flagellum: detection and the possible impact on gametes motility in mammals	Shitikov AD, Voronezhskaya EE, Melnikova VI; Moscow State University, Koltsov Institute of Developmental Biology RAS
7-9	Biomechanics of tail heaving predict preferred walking speed of <i>Tyrannosaurus rex</i>	van Bijlert PA, van Soest AJK, Schulp AS; Vrije Universiteit Amsterdam and Naturalis Biodiversity Center, Vrije Universiteit Amsterdam, Naturalis Biodiversity Center and Utrecht University

Session 8

Complementary to S6: Spatiotemporal Dynamics of Animal Communication

Chair: Jessleen Kanwal

8-1	The evolution of face plumage patterns in amazon parrots	Ali JR, Stoddard MC; Princeton University
8-2	Color in motion: Using photogrammetry to study dynamic displays in virtual environments	Miller AE, Hogan BG, Stoddard MC; Princeton University
8-3	Surveying seasonal changes in behavior and wing coloration in a polyphenic butterfly	Hirzel GE, Westerman EL; University of Arkansas Fayetteville
8-4	Singing in a silent spring: birds respond to a half-century soundscape reversion during the COVID-19 shutdown	Derryberry EP, Phillips JN, Derryberry GE, Blum MJ, Luther D; University of Tennessee, Texas A&M San Antonio, George Mason University
8-5	Immediate effects of song competition on the song of male Lincoln's sparrows	Sockman KW, Lyons SM, Caro SP; University of North Carolina
8-6	Simultaneous neural encoding of spatial and directional information in the dragonfly	Ko D, Haddad A, Clopath C, Lin HT; Imperial College London
8-7	Electrocommunication signals and aggression are temporally linked in an electric fish with male morphological variation	Freiler MK, Proffitt MR, Smith GT; Indiana University Bloomington
8-8	Self-grooming with an audience in mind, male meadow voles tailor their behaviors based on social contexts	Scauzillo RC, Ferkin MH; University of Memphis
8-9	Towards the neural basis of social attention hierarchies	Lessig EK, Hofmann HA; University of Texas at Austin
8-10	A computational model of locust visual motion detection incorporating global and feedforward inhibition	Olson EGN, Gray JR, Wiens TK; University of Saskatchewan

Session 9

Complementary to S7: The Integrative Biology of Pigment Organelles

Chair: Florent Figon

9-1	Pigment identification and quantification in the jewel beetles (Buprestidae: Stigmoderini)	Weir SE, Lord NP; Louisiana State University
9-2	Hiding in the deep: ultra-black camouflage in fishes	Davis AL, Thomas KN, Goetz FE, Robison BH, Johnsen S, Osborn KJ; Duke University, Natural History Museum, Smithsonian Institution, MBARI
9-3	Jewels of iridescence: Mechanisms of structural color and its significance in insect systematics	Chow A, Lord N; Louisiana State University AgCenter
9-4	Heating rates in jewel beetles are more strongly influenced by near-infrared than visible reflectance	Wang L-Y, Franklin AM, Black JR, Stuart-Fox D; University of Melbourne
9-5	The link between mitochondrial metabolism and pigment production in interpopulation crosses of copepods	Powers MJ, Martz LD, Weaver RJ, Burton RS, Hill GE; Auburn University, University of California San Diego, University of Texas at Austin

Contributed Talks

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| 9-6 | Carotenoid coloration in non-passerine birds and expectations of carotenoid expression in extinct Dinosauria | <i>Davis SN, Clarke JA; University of Texas at Austin</i> |
| 9-7 | The evolution of pigment diversity in fireflies | <i>Popecki MS, Wares JP, Stanger-Hall KF; University of Georgia</i> |
| 9-8 | Lantana camara also uses lipids to make metallic blue fruit: a second origin of lipid-based structural color | <i>Sinnott-Armstrong MA, Smith SD, Vignolini S; University of Colorado-Boulder; University of Cambridge</i> |
| 9-10 | Metabolic cost of octopus chromatophore system | <i>Sonner SC, Onthank K; Walla Walla University</i> |

Session 10

Complementary to S8: The Biology of Sticky: Adhesive Silk, Fiber, and Glue Biomaterials Across Eukaryota

Chair: Sarah Stellwagen

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| 10-1 | Ecomorphological correlates of the adhesive setae and setal fields of Jamaican anoles | <i>Garner AM, Wilson MC, Wright C, Russell AP, Dhinojwala A, Niewiarowski PH; University of Akron, University of Calgary</i> |
| 10-2 | Stick to it: Comparisons of passive adhesion in waterfall-climbing fishes on challenging substrates | <i>Palecek-McClung AM, Schoenfuss HL, Blob RW; Clemson University, Saint Cloud State University</i> |
| 10-3 | Cling performance and contact area in European Hydromantes (Speleomantes) salamanders | <i>O'Donnell MK, Lunghi E, Deban SM; Brown University, Chinese Academy of Sciences, University of South Florida</i> |
| 10-4 | 3D imaging of the lizard adhesive system via photogrammetry | <i>Hagey TJ, Pillai R, Riedel J, Schwarzkopf L; Mississippi University for Women, James Cook University</i> |
| 10-5 | Visualisation and ionic control of adhesive release in prey capture of the ctenophore Pleurobrachia pileus | <i>Merces GOT, Pickering M; University College Dublin</i> |

Session 11

Complementary to S9: Sending and Receiving Signals: Endocrine Modulation of Social Communication

Chair: Julie Butler

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| 11-1 | Reproductive state modulates retinal sensitivity to light in female tungara frogs | <i>Leslie CE, Rosencrans RF, Walkowski W, Gordon WC, Bazan NG, Ryan MJ, Farris HE; University of Texas Austin, University of Alabama Birmingham, LSUHSC - New Orleans</i> |
| 11-2 | Effects of systemically and locally increased serotonin on male response to female rejection calls | <i>Hood KE, Hurley LM; Indiana University</i> |
| 11-3 | 'I'm open to it': African giant pouched rat females signal reproductive availability to potential mates and competitors via altered signal composition but not via behavior | <i>Freeman AR, Lo B, Choudhry A, Singh B, Ophir AG; Cornell University, Thomas Jefferson High School for Science and Technology</i> |
| 11-4 | Social transmission of queen estradiol levels in eusocial naked mole-rats | <i>Edwards PD, Mastromonaco G, Holmes MM; University of Toronto Mississauga, Toronto Zoo</i> |
| 11-5 | Does testosterone facilitate dynamic relationships in Anolis lizard behavior, morphology, and physiology? | <i>Johnson LE, Ivanov BM, Johnson MA; Trinity University</i> |
| 11-6 | Sex-specific gene expression in Xenopus laevis laryngeal muscle | <i>Paulis D, Velosa A, Zornik E, Ryba T, Leininger E*; New College of Florida, Reed College</i> |
| 11-7 | Conspecific chemical cues facilitate mate trailing by invasive Argentine black and white tegus | <i>Bukovich IMG, Richard SA, Tillman EA, Jayamohan S, Humphrey JS, Carrington PE, Bruce WE, Kluever BM, Avery ML, Parker MR; James Madison University, USDA APHIS NWRC, Gainesville, FL, USDA APHIS NWRC, Gainesville, FL, USDA APHIS NWRC, Gainesville, FL, USDA APHIS NWRC, Gainesville, FL, USDA APHIS NWRC, Gainesville, FL</i> |
| 11-8 | A dual role for prostaglandin F signaling in hormonal and pheromonal signaling in cichlid fish | <i>Juntti SA, Li C-Y; University of Maryland College Park</i> |

Session 12

Complementary to S10: Metachronal Coordination of Multiple Appendages for Swimming and Pumping I

Chair: Margaret Byron

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| 12-1 | The role of suction thrust in the metachronal paddles of swimming invertebrates | <i>Colin SP, Costello JH, Sutherland KR, Gemmell BJ, Dabiri JO, DuClos K; Roger Williams University, Providence College, University of Oregon, University of South Florida, CalTec</i> |
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Contributed Talks

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| 12-2 | Coordination of jet propulsion among physonect siphonophores | <i>Strock S, Colin SC, Daniels J, Costello JH, Katija K; Roger Williams University, Monterey Bay Aquarium Research Institute, Providence College</i> |
| 12-3 | Measuring metachronal maneuvering at the milliscale: an analysis of ctenophore swimming kinematics | <i>Herrera-Amaya A, Byron ML; Penn State University</i> |
| 12-4 | Age-related cilia shortening in marine polychaeta <i>Dinophilus gyrotilatus</i> | <i>Fofanova E, Voronezhskaya E; Russian Academy of Sciences (IDB RAS)</i> |
| 12-5 | Synchronous swimming in siphonophores yields higher maximum speeds but lower efficiency and higher cost of transport | <i>Du Clos KT, Gemmell BJ, Colin SP, Costello JH, Dabiri JO, Sutherland KR; University of Oregon, University of South Florida, Roger Williams University, Providence College, California Institute of Technology</i> |
| 12-6 | Effects of hinge angle variation on metachronal paddling | <i>Kasaju VT, Ford MP*, Santhanakrishnan A; Oklahoma State University</i> |
| 12-7 | Dumb it down: A simplified metachronal locomotion mathematical model | <i>Colón DA, Ford MP, Santhanakrishnan A; Oklahoma State University</i> |
| 12-8 | Roles of body and tail angles on metachronal swimming performance | <i>Price CT, Ford MP, Santhanakrishnan A; Oklahoma State University</i> |

Session 13

Complementary to S10: Metachronal Coordination of Multiple Appendages for Swimming and Pumping II

Chair: Margaret Byron

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| 13-1 | Stroke frequency and size effects in metachronal swimming | <i>Ford MP, Price CT, Santhanakrishnan A; Oklahoma State University</i> |
| 13-3 | Pumping and swimming robots in a highly viscous fluid | <i>Hayashi R, Takagi D; University of Hawaii at Manoa</i> |
| 13-4 | Swimming with many legs: Hydrodynamics and scaling of metachronal rowing | <i>Shoele K, Murphy D; Florida State University, University of South Florida</i> |

Session 14

Complementary to S11: Biology's Best Friend: Bridging Disciplinary Gaps to Advance Canine Science I

Chair: Heather Smith

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| 14-1 | Potential risk factors that influence pet predation by coyotes | <i>Vo K, Amaya M, Stankowich T; California State University Long Beach</i> |
| 14-2 | Gait control for obstacle negotiation in canines | <i>Joyce M, Wilshin S, Qian F, Spence A; Temple University, Royal Veterinary College, University of Southern California</i> |
| 14-3 | Adaptations to cursoriality and digit reduction in the forelimb and hind limb musculature of the African wild dog (<i>Lycan pictus</i>) | <i>Smith HF, Adrian B, Koshy R, Alwiel R, Wright W, Grossman A; Midwestern University</i> |
| 14-4 | Ecological drivers of carnivoran body shape evolution | <i>Slibeck B, Law CJ; Columbia University, American Museum of Natural History</i> |
| 14-5 | Functional adaptations in the forelimb and hind limb morphology of the snow leopard (<i>Panthera uncia</i>) | <i>Smith HF, Townsend KE, Adrian B, Marsh S, Levy S, Hassur R, Nagy S, Mohamed H, Echols S, Grossman A; Midwestern University</i> |
| 14-7 | Comparison of bite force and skull dimensions between urban and rural coyotes (<i>Canis latrans</i>) | <i>Jardón L, Stankowich T; California State University - Long Beach</i> |
| 14-8 | Why are the fastest runners of intermediate size? Contrasting scaling of mechanical demands and muscle supply of work and power | <i>Usherwood JR; Royal Veterinary College</i> |

Session 15

Complementary to S11: Biology's Best Friend: Bridging Disciplinary Gaps to Advance Canine Science II

Chair: Alexandra Protopopova

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| 15-1 | Comparing the ability of miniature pigs and family dogs to learn iconic and non-iconic orientation cues | <i>Dror S, Magyari L, Fugazza C, Miklósi A, Andics A; Eötvös Loránd University, MTA-ELTE 'Lendület' Neuroethology of Communication Research Group, Hungarian Academy of Sciences</i> |
| 15-2 | Quantifying canine activity using collar-based accelerometers: a cut-point free approach | <i>Karimjee K, Olsen E, Piercy RJ, Daley M; Royal Veterinary College, Swedish University of Agricultural Sciences, University of California Irvine</i> |

Contributed Talks

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| 15-3 | The role of companion animal scientists in anticipating and adapting to the fallout of climate change | Protopopova A; University of British Columbia |
| 15-4 | “Who’s a smart boy?” Qualitative variation in the ability of dogs to learning object names | Dror S, Miklósi A, Temesi A, Sommesse A, Fugazza C; Eötvös Loránd University |
| 15-5 | Acoustics of dogs’ interspecific voice discrimination ability | Gábor A, Kaszás N, Faragó T, Pérez Fraga P, Lovas M, Andics A; Department of Ethology, ELTE |
| 15-6 | Social context influences resting physiology in wolves and dogs | Kortekaas K, Jean-Joseph HG, Kotrschal K; University of Vienna, University of Veterinary Medicine |
| 15-7 | Circannual time budget of equally raised wolves and dogs | Jean-Joseph HG, Wacker K, Kotrschal K; University of Vienna, University of Veterinary Medicine, Ludwig-Maximilian-University of Munich |
| 15-8 | A molecular perspective on the evolution of behavior in dogs | Lord KA, Li X, Karlsson EK; University of Massachusetts Medical School, The Broad Institute of MIT and Harvard |

Session 16

Complementary to S12: Manakin Genomics: Comparative Studies of Evolution and Behavior in a Unique Clade of Birds

Chair: Blake Jones

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| 16-1 | A telomeric perspective on the (anti-)aging phenotype of male wire-tailed manakins (<i>Pipra filicauda</i>) | Vernasco BJ, Dakin R, Majer AD, Haussmann MF, Ryder TB, Moore IT; Washington State University, Carleton University, Bucknell University, Bird Conservancy of the Rockies, Virginia Tech |
| 16-2 | Male-male coalitions and aggression in two species of manakins | Alfonso CA, Moore IT; Virginia Tech |
| 16-3 | More than meets the eye: high-speed video reveals aerobatic performance and the production of mechanical sounds in mating displays | Boyle WA, Bodony DJ, Shogren EH, Nguyen L, Day EB; Kansas State University |
| 16-4 | Reciprocity is a pathway to social network stability | Clunis P, Ryder TB, Dakin R; Carleton University, Bird Conservancy of the Rockies |
| 16-5 | Delayed plumage maturation in manakins: a review on its patterns and functions | Schaedler LM, Taylor L, Anciães M; Instituto Nacional de Pesquisas da Amazônia, Yale University |
| 16-6 | Gene expression in neuroendocrine tissues of a cooperatively lekking bird, the wire-tailed manakin | Bolton P E, Balakrishnan CN, Ryder T B, Dakin R, Moore I T, Horton B M; East Carolina University, Smithsonian Institution, Virginia Tech, Millersville University |
| 16-7 | Genetic but not phenotypic differentiation is determined by geographic and climatic distances in the blue-crowned manakin | Paulo P, Teófilo FH, Ferreira C, Moncrieff AE, Bandeira LN, Nuñez-Penichet C, Bosholn M, Machado AF, Peçanha WT, Hrbek T, Kaefer IL, Anciães M; Instituto Nacional de Pesquisas da Amazônia, Louisiana State University, University of Kansas, Universidade Federal do Rio Grande do Sul, Universidade Federal do Amazonas |
| 16-8 | Evolution of visual perception in response to dietary shift and sexual selection | Driver RJ, White ND, Balakrishnan CN; East Carolina University, National Eye Institute |
| 16-9 | Testosterone-mediated behavior shapes social networks in wire-tailed manakins | Dakin R, Moore IT, Horton BM, Vernasco BJ, Ryder TB; Carleton University, Virginia Tech, Millersville University, Washington State University, Bird Conservancy of the Rockies |

Session 17

Adaptation

Chair: Justin Havird

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| 17-1 | The specialists’ guide to the novel niche—How shifts in aggression, feeding behavior, and mate preference contribute to scale- and snail-eating in pupfishes | St. John ME, Martin CH; University of California - Berkeley |
| 17-2 | Using integrative biology to infer adaptation from comparisons of two (or a few) species | Cox CL, Logan ML; Florida International University, University of Nevada Reno, Georgia Southern University |
| 17-3 | Nanopore amplicon sequencing reveals molecular convergence and local adaptation of rhodopsin in Great Lakes salmonids | Eaton KM, Bernal MA, Backenstose NJC, Yule DL, Krabbenhoft TJ; University at Buffalo, Auburn University, US Geological Survey, |

Contributed Talks

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| 17-4 | Significance of microbially-liberated urea-nitrogen in pregnant and lactating arctic ground squirrels | Sadowska J, Medlock S, Carlson KM, Buck CL, Duddleston KN; University of Białystok, University of Alaska, Northern Arizona University |
| 17-5 | Effect of sprint training on Insulin-like Growth Factor 1 and Insulin-like Growth Factor 2 expression in green anoles (<i>Anolis carolinensis</i>) | Marks JR, Lailvaux SP, Beatty AE, Schwartz TS; University of New Orleans, Auburn University |
| 17-6 | Recolorize: a flexible R package for color classification | Weller HI, Schwartz ST, Karan E, Lord NP; Brown University, University of California Los Angeles, Louisiana State University |
| 17-7 | Adaptive seasonal shift towards investment in fewer, larger offspring | Hall JM, Mitchell TS, Thawley CJ, Stroud JT, Warner DA; Auburn University, University of Minnesota, Neumann University, Washington University |
| 17-8 | Selection (or lack thereof) on mitochondrial genes in animals: tales from bivalves, electric fishes, snakes, and elephants | Havird JC, Maeda G, Zwonitzer K; University of Texas at Austin |

Session 18

Aggregations & Migrations

Chair: *Valentina Di Santo*

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| 18-1 | Collective swimming kinematics of <i>Carcharhinus limbatus</i> to <i>Sphyrna mokarran</i> during wild predation events | Ruddy BT, Kirwan DJ, Kajiura SM, Porter ME; Florida Atlantic University |
| 18-2 | Feeding affects individual and collective behavior of schooling fish | Di Santo V, Lauder GV; Stockholm University, Harvard University |
| 18-3 | Effect of speed on collective behavior in schooling and shoaling fishes | Sepúlveda-Rodríguez G, Lauder GV, Di Santo V; Stockholm University, Harvard University |
| 18-4 | Modeling collective dynamics of aquatic worm blobs | Nguyen C, Ozkan-Aydin Y, Bhamla MS, Peleg O; University of Colorado Boulder, Georgia Institute of Technology, Santa Fe Institute |
| 18-5 | Collective locomotion in entangled worm and robot blobs | Ozkan Aydin Y, Goldman D, Bhamla S*; Georgia Tech |
| 18-6 | Internal structure of honey bee swarms | Shishkov O, Nave GK, Peleg O; University of Colorado Boulder |
| 18-7 | Using dead reckoning to identify fine scale movements of navigating zebra in Botswana, Africa | Morrell A, Bartlam-Brooks H, Bennitt E, Webster J, Wilson A; Royal Veterinary College, University of Botswana |
| 18-8 | Swimming in thrust wakes: implications for fish schooling dynamics | Thandiackal R, Lauder GV; Harvard University |
| 18-9 | The evolution of polymorphic mimicry in <i>Heliconius</i> butterflies | Ogilvie JGO, Van Belleghem S, Range R, Chouteau M, Counterman BA; Auburn University |

Session 19

Animal Communication

Chair: *Fernanda Duque*

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|-------------|---|---|
| 19-1 | Do smaller hummingbirds sing higher pitched songs? | Duque FG, Carruth LL; Georgia State University |
| 19-2 | Separating noise and function in systems of animal communication: a comparative study of aggressive signaling in crayfish | Graham ZA, Angilletta M; Arizona State University |
| 19-3 | Neural correlates of drumming behavior in free-living woodpeckers | Schuppe E, Catin L, Biegler M, Jarvis E, Fuxjager M; Cornell University, Rockefeller University, Brown University |
| 19-4 | Age-related stereotypy in song of grasshopper sparrows | Lohr B, Brown M, Moyer MJ, Hill R; University of Maryland Baltimore County |
| 19-5 | Territory owners, floaters, and sneaker males use different behavioral strategies in green anole lizards (<i>Anolis carolinensis</i>) | Bush JM, Ellison M, Simberloff D; University of Tennessee Knoxville, Oklahoma State University |
| 19-6 | Frogtalkers: Automating the parameterization of frog calls for comparative studies | Erdmann JA; Oklahoma State University |
| 19-7 | Can fluorescence in reptiles and amphibians have a visual signalling function? | Cavagnaro JW; Arizona State University |
| 19-8 | How do birds modulate sound with their vocal tract? | Delamare IM, Olson RA, Provini P; Center for Research and Interdisciplinarity (CRI) |

Contributed Talks

19-9	Amplitude patterns in woodpecker drumming	<i>Rutter AR, Roberts TJ; Brown University</i>
19-10	A rallid ballad: Correlates of communal signaling in the rails (Rallidae), a model system for studies of avian duets	<i>Goldberg DL, Sadd BM, Capparella AP; Illinois State University</i>
19-11	Can you sing that again? Assessing wide-scale vocal adjustment in urban songbirds	<i>Johnson JR, Piland NC; University of California Davis, University of Chicago</i>
19-12	Toxic, unpalatable and aposematic butterflies respond to specialist predatory bird calls	<i>Potdar S, Westerman EL; University of Arkansas</i>
19-13	Acoustic variation across social contexts in neotropical singing mice (<i>S. teguina</i>)	<i>Giglio EM, Campbell P, Phelps SM; University of Texas at Austin, University of California at Riverside</i>

Session 20

Anthropogenic and Urban influence on Behavior I

Chair: Sara Lipshutz

20-1	Large scale deregulation of gene expression by artificial light at night in the common toads	<i>Touzot M, Lefebure T, Lengagne T, Secondi J, Duchamp C, Mondy N; Lyon 1 University</i>
20-2	Behavioral and transcriptomic responses to sublethal thermal stress in zebra finches	<i>Lipshutz SE, Howell CR, Buechlein AM, Rusch DB, Derryberry EP, Rosvall KA; Indiana University Bloomington, University of Tennessee Knoxville</i>
20-3	A widely used mito-toxic fungicide negatively affects honey bee (<i>Apis mellifera</i>) hemolymph protein and vitellogenin levels	<i>Fisher II A, DeGrandi-Hoffman G, Smith BH, Fewell JH, Harrison JF; Arizona State University, USDA-ARS</i>
20-4	Anthropogenic effects on European starling nestlings growth and cholesterol	<i>Linkous CR, Guindre-Parker S; Kennesaw State University</i>
20-5	Parenting in the city: Does urbanization influence avian incubation behavior?	<i>Hope SF, Hopkins WA, Angelier F; Centre d'Etudes Biologiques de Chizé, Virginia Tech</i>
20-6	The sensory impacts of climate change: Bathymetric shifts and visually-mediated interactions in aquatic species	<i>Caves EM, Johnsen S; University of Exeter, Duke University</i>
20-7	Environmentally relevant atrazine exposure causes chemosensory deficits, DNA damage and changes in cell morphology	<i>Belanger RM, Crile KG, Abdulelah SA; University of Detroit Mercy</i>
20-8	What about large waste? Effects of plastic bags on behavior of zebrafish	<i>Suarez-Rodriguez MSR, Tufarelli AT, Suriyampola PSS, Martins EPM; Arizona State University</i>

Session 21

Anthropogenic and Urban influence on Behavior II

Chair: Sydney Hope

21-1	It's getting hot in here: The effects of temperature on behavioral allocation in songbirds	<i>Messerly KI, Coomes CM, Derryberry EP; University of Tennessee - Knoxville</i>
21-2	Turning up the lights: Ocean acidification may increase light intensity of secretory bioluminescent signaling	<i>Iwanicki T, DeTurk H, Porter ML; University of Hawai'i at Mānoa</i>
21-3	The role of ionotropic receptors in behavioural alterations at elevated CO ₂ in a cephalopod	<i>Thomas JT, Spady BL, Munday PL, Watson S-A; James Cook University, Museum of Tropical Queensland</i>
21-4	Effects of bisphenol-A on the morphology and survival of larvae of the sand dollar <i>Dendraster excentricus</i> (Echinodermata, Echinoidea)	<i>Darin EA; California State University Long Beach, Cabrillo Marine Aquarium</i>
21-5	Urbanization affects individual behavior and cognition in <i>Gambusia affinis</i>	<i>Perez A, Gabor C, Aspbury A; Texas State University</i>
21-6	Effects of boat motor sound on bluegill sunfish (<i>Lepomis macrochirus</i>) nesting behavior	<i>Hall LM, Mensinger AF; University of Minnesota-Duluth</i>
21-7	Opening the black box of bird-window collisions: passive field recording and experiments in laboratory	<i>Samuels B, MacDougall-Shackleton S, Fenton B; University of Western Ontario, University of Western Ontario</i>
21-8	Is spatial navigation in echolocating bats affected by pesticides?	<i>Sandoval Herrera NI, Faure PA, Welch Jr. K; University of Toronto, McMaster University</i>

Contributed Talks

- 21-9** The ramifications of prolonged co-exposure to heat and pesticide conglomerate in swimming behaviors of common goldfish (*Carassius auratus*)

Lacy B, Rivera M, Estrada L, Rahman M; University of Texas Rio Grande Valley, Brownsville TX

Session 22

Biological Materials: (Ultra)Structure & Function I

Chair: Molly Gabler-Smith

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| 22-1 | Evaluating the modulus of flying insect thoraxes with nanoindentation | <i>Yager CC, Casey CB, Vahidi G, Jankauski MA, Heveran CM; Montana State University</i> |
| 22-2 | Mussels maintain repair during chronic mechanical fatigue | <i>Crane RL, Denny MW; Stanford University</i> |
| 22-3 | Fight or flight: tradeoffs between mechanical and behavioral defenses in bivalve shell shape | <i>Johnson EH; Paleontological Research Institution</i> |
| 22-4 | An evaluation of ontogenetic allometry of defensive and feeding efficiency properties of skeletal components of the regular sea urchin <i>Lytechinus variegatus</i> | <i>Edwards RA, McClintock JB; University of Alabama at Birmingham</i> |
| 22-5 | High spatial resolution mapping of the mucosal proteome of the gills of <i>Crassostrea virginica</i> : implication in particle processing | <i>Pales Espinosa E, Allam B; Stony Brook University</i> |
| 22-6 | Mighty fine spines: trade-offs in puncture performance among spiny cartilaginous fishes | <i>Kennedy KN, Hall KC, Cohen KE, Donatelli CM, Kruppert S, Kolmann MA; University of California Berkeley, University of Washington, Friday Harbor Labs, University of Ottawa, University of Michigan</i> |
| 22-7 | High resolution measurements of billfish skin roughness | <i>Stewart MT, Wainwright DK, Nikora VI, Cameron SM, Thunert M, Stoesser T; University of Aberdeen, Yale University Peabody Museum of Natural History, ThorLabs, University College London</i> |
| 22-8 | Variable roughness of shark skin inspired surface impacts bacterial migration rates | <i>Herbst HD, Scheurle D, Clark A, Porter ME; Florida Atlantic University</i> |
| 22-9 | Shark dermal denticles: novel patterns on branchial skin | <i>Gabler-Smith MK, Wainwright DK, Wong GA, Lauder GV; Harvard University, Yale University</i> |
| 22-10 | The surfaces of sharks and bony fishes: a comparison of scale structure and function | <i>Wainwright DK, Lauder GV; Yale University, Harvard University</i> |
| 22-11 | Microstructures and measured morphometrics of skate egg cases | <i>Elcock JN, Hall KC, Donatelli C, Farina S, Summers AP; University of Washington, Howard University, University of Ottawa</i> |

Session 23

Biological Materials: (Ultra)Structure & Function II

Chair: Dara Orbach

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| 23-1 | Scaling of secretory cells and cell products with body size in hagfishes | <i>Zeng Y, Petrichko S, Nieders K, Fudge D; Chapman University</i> |
| 23-2 | That's not how it works: Particle aggregation in the viscous environment of the epibranchial organ | <i>Evans AJ, Cohen KE, Summers AP, Kolmann MA, Egan JP, Hernandez LP; George Washington University, University of Washington, University of Michigan, Western Michigan University</i> |
| 23-3 | How the <i>vombatus ursinus</i> forms cubic feces, with an application to the feces of terrestrial mammals | <i>Magondou B, Cervantes G, Lee A, Kaminski C, Yang P, Carver S, Hu D; Georgia Institute of Technology, University of Tasmania</i> |
| 23-4 | Peeing one drop at a time: How sharpshooter insects use superpropulsion to launch their fluid excreta and why | <i>Challita EJ, Acharya R, Krugner R, Bhamla S; Georgia Institute of Technology, United States Department of Agriculture</i> |
| 23-5 | Moth-catching by spiders: the spreading behavior of capture glue depends on the morphology of moth scales | <i>Diaz C, Aaron E, Long JH; Vassar College, Colby College</i> |
| 23-6 | Mobility power flow: How click beetles transmit and dissipate mechanical power | <i>Bolmin O, Alleyne M, Wissa AA; University of Illinois at Urbana-Champaign</i> |
| 23-7 | Devilish dynamics: precision mandible rotation without pins by ultrafast, spring-actuated trap-jaw strikes | <i>Sutton GP, St. Pierre R, Kuo CY, Summers A, Bergbreiter S, Patek SN; U. Lincoln, Carnegie Mellon, National Taiwan U., U. Washington, Duke U.</i> |
| 23-9 | Load reduction and reconfiguration capabilities of branched trees | <i>Ojo O, Shoele K; FAMU-FSU College of Engineering Tallahassee</i> |
| 23-10 | Skin morphology and microstructure in the elephant trunk | <i>Sordilla S, Schulz A, Hu D; Brown University, Georgia Tech</i> |

Contributed Talks

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| 23-11 | Elephant Trunks expand in volume when reaching for distant objects | Boyle M, Schulz A, Hu D; Georgia Tech |
| 23-12 | Wrinkles and folds enable stretching of elephant trunk skin | Fourney E, Sukhwani A, Schulz A, Hu D; Georgia Tech |

Session 24

Biomimetics & Robotics

Chair: Robert Brocklehurst

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| 24-1 | Function ¹ in evolutionary biology and biomimetics: moving past the philosophical conundrum | Snell-Rood EC, Smirnoff D; University of Minnesota |
| 24-2 | An untethered remora-inspired suckerfish robot: locomotor effects of the disc pad, undulatory body, and pectoral fins | Wang S, Zhao W, Wainwright DK, Xu H, Li L, Sun W, Wen L; Beihang University, Yale University |
| 24-3 | The biomimetic remora disc with independent compartment enables an aerial-aquatic quadrotor robot perching to diverse complex surfaces | Li L, Wang S, Chen B, Song S, Zhao W, Wen L*; Beihang University |
| 24-4 | Using a biologically mimicking climbing robot to explore the performance landscape of climbing in lizards | Clemente CJ, Schultz JS, Beck HK, Haagenzen T, Proost T; University of the Sunshine Coast, Hochschule Bremen |
| 24-6 | Tuna robotics: measuring body pressure, thrust forces, and work during linear acceleration | Thandiackal R, White C, Bart-Smith H, Lauder G*; Harvard University, University of Virginia |
| 24-7 | Robophysical models clarify the effects of body depth on fish maneuverability | Howe SP, Bryant K, Duff A, Astley HC; University of Akron |
| 24-8 | Performance tradeoffs in anguilliform swimming via viscoelastic modulation | Paez L, Melo K, Ijspeert A; EPFL, KM-RoBoTa Srl |
| 24-9 | Passive environmental navigation via mechanical interactions in a novel snake robophysical model | Maisonneuve MC, Schiebel PE, Diaz K, Goldman DI; Georgia Institute of Technology, Harvard |
| 24-10 | A sensorized robophysical model to study snake locomotion in complex 3-D terrain | Ramesh D, Fu Q, Wang K, Othayoth R, Li C; Johns Hopkins University |
| 24-11 | Advantages of limb-body coordination and passive body structures in a myriapod robophysical model | Ozkan-Aydin Y, Aydin E, Chong B, Goldman DI; Georgia Tech |
| 24-12 | Minimal robophysical model for multi-flagellate propulsion | Diaz K, Robinson TL*, Ozkan-Aydin Y, Goldman DI, Wan KY; Georgia Tech, University of Exeter |

Session 25

Bone Structure: Ecology & Phylogeny

Chair: Emily Lessner

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| 25-1 | The microarchitecture and mechanical properties of cetacean vertebral trabecular bone | Ingle DN, Porter ME; Texas A&M University at Galveston, Florida Atlantic University |
| 25-2 | Evolution of bone cortical compactness in slow arboreal mammals | Alfieri F, Nyakatura JA, Amson E; Institut für Biologie, Leibniz-Institut für Evolutions- und Biodiversitätsforschung |
| 25-3 | Bone plasticity in arboreal mammals: Material and mechanical properties of sloth limb bones | Mossor AM, Young JW, Butcher MT; NEOMED, Youngstown State University |
| 25-4 | Differing effects of size and lifestyle on bone structure in mammals | Amson E, Bibi F; Museum für Naturkunde - Leibniz-Institut für Evolutions- und Biodiversitätsforschung |
| 25-5 | Changes in limb bone neutral axis orientation during climbing in iguanas | Munteanu VD, Diamond KM, Blob RW; Clemson University, Seattle Children's Research Institute |
| 25-6 | Adventures inside shrew vertebrae: trabecular bone morphology and regionalization in Soricidae | Smith SM, Angielczyk KD; Field Museum of Natural History, Negaunee Integrative Research Center |
| 25-7 | Diversification of internal vertebral morphology of actinopterygian fishes along the benthic-pelagic habitat axis | Baxter DL, Tytell ED; Tufts University |
| 25-8 | Characterizing the effects of increased muscle load on the flat scleral ossicles of Danio rerio | McInnis SJL, Franz-Odenaal TA; Saint Mary's University, Mount Saint Vincent University |
| 25-9 | Effects of captivity on the bone microstructure of xenarthrous vertebrae | Zack EH, Smith SM, Angielczyk KD; University of Chicago, Field Museum of Natural History |

Contributed Talks

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| 25-10 | Limb bone mineral density and morphology affected by more than just body mass in domestic turkeys | <i>Betterton LM, Shirk MT, Pirtle JM, Rohlf P, Stover KK*; WVSOM, Aviagen Turkeys Inc.</i> |
| 25-11 | Fusion reinforces metatarsals and facilitates larger body sizes in jerboas (Dipodidae) | <i>Villacís Núñez CN, Cooper KL, Moore TY; University of Michigan, University of California San Diego</i> |
| 25-12 | Postcranial skeletal pneumaticity in Accipitriformes | <i>Gutherz SB, O'Connor PM; Ohio University</i> |
| 25-13 | Trying to understand bird bone? You'll need reinforcements! | <i>Chase HT, Tobalske BW; University of Montana</i> |

Session 26

Cellular and Molecular Physiology

Chair: Wendy Hood

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| 26-1 | Gene regulatory roles of DNA methylation during transgenerational plasticity in the sea urchin <i>Strongylocentrotus purpuratus</i> | <i>Bogan SN, Strader ME, Hofmann GE; University of California Santa Barbara, Auburn University</i> |
| 26-2 | Molecular responses to catastrophic molting in a marine mammal | <i>Keith A, Khudyakov J, Codde S, Vierra C, Crocker D; University of the Pacific, Inventory & Monitoring Program, Sonoma State University</i> |
| 26-3 | Seal endothelial cells mount a rapid and sustained response to hypoxia | <i>Allen KN, Luong D, Vázquez-Medina JP; University of California Berkeley</i> |
| 26-4 | Direct reprogramming of dermal fibroblasts derived from Northern elephant seals into muscle cells | <i>Lam EK, Torres-Velarde JM, Allen KN, Crocker DE, Vazquez-Medina JP; University of California Berkeley, Sonoma State University</i> |
| 26-5 | Effect of temperature on heart rate for <i>Phaenicia sericata</i> and <i>Drosophila melanogaster</i> with altered expression of the TRPA1 receptors | <i>Marguerite NT, Bernard J, Harrison DA, Harris D, Cooper RL; University of Kentucky</i> |
| 26-6 | Insect hemoglobins: Transcriptomes reveal expression of hemoglobins throughout Insecta | <i>Herhold HW, Davis SR, Grimaldi DA; American Museum of Natural History</i> |
| 26-8 | Cold stimulated cytoskeletal arrest in western painted turtle hepatocytes | <i>Myrka AM, Frost R, Distefano D, Plotnikov SV, Buck LT; University of Toronto</i> |
| 26-9 | Life history, condition dependency, and mitochondrial performance | <i>Hood WR; Auburn University</i> |
| 26-10 | Individual variation in cellular unfolded protein response, respiratory capacity, and stress tolerance in deer mice (<i>Peromyscus maniculatus</i>) | <i>Yap KN, Yamada KYH, Zikeli SL, Zhang Y, Zhang Y, Kavazis AN, Gladden LB, Roberts MD, Kiaris H, Hood WR; Auburn University, University of Memphis, University of South Carolina</i> |
| 26-11 | Expression of markers associated with carbon monoxide signaling in a deep-diving mammal | <i>Piotrowski ER, Tift MS, Crocker DE, Khudyakov JI; University of the Pacific, University of North Carolina Wilmington, Sonoma State University</i> |
| 26-12 | A three-quarter reduction of muscular metabolism in mammals: A universal mitochondrial threshold for reactive oxygen species release? | <i>Boël M, Roussel D, Voituron Y; Lyon 1 University</i> |

Session 27

Climate Change and Species Interactions

Chair: Dillon Monroe

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| 27-1 | Exposure to warmer water, but not pond drying as tadpoles contributes to decreased survival when exposed to fire ants | <i>Monroe DM, Offermann G, Gabor CR; Texas State University</i> |
| 27-2 | The influence of conspecifics in thermal preference in tree lizards (<i>Urosaurus ornatus</i>) | <i>Goerge TM, Miles DB; Ohio University</i> |
| 27-3 | Climate change and ecological interactions: How vegetation cover affect the performance of desert lizards? | <i>Stark G, Levy O; Tel Aviv University</i> |
| 27-4 | Field and behavioral analysis of microhabitat preference in two species of Plethodontid salamanders in the Southern Appalachian Mountains | <i>Chapman TL, Bidwell JR; East Tennessee State University</i> |
| 27-5 | Social network analysis of two sympatric lizard species long-nosed leopard lizards (<i>Gambelia wislizenii</i>) and Western whiptails (<i>Aspidoscelis tigris</i>) | <i>Yost CM, Gnoose MA, Yang JL, Utsumi KL; University of Wyoming, Mississippi State University, University of Southern California, University of Kansas</i> |

Contributed Talks

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| 27-6 | The transduction of climate change in rocky intertidal porcelain crabs <i>P. cinctipes</i> and <i>P. manimaculus</i> through thermal stress, increased density, and competition | Sayavong N, Estrada M, Salas H, Gunderson AR, Stillman JH, Tsukimura B; California State University Fresno |
| 27-7 | A comparison of the effects of two anuran competitors on breeding site selection in a treefrog | Dimitrie DA, Benard MF; Case Western Reserve University |
| 27-8 | Species-specific responses to warming alter community composition of California dragonflies | Tituskin JR, Waddell SM, Mabry KE; New Mexico State University, University of California Davis |

Session 28

Community Ecology and Biodiversity

Chair: Douglas Fudge

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| 28-1 | Metabarcoding analysis of stomach contents in <i>Totoaba macdonaldi</i> | Mroue-Ruiz FH, Schramm-Urrutia Y, Pacheco-Sandoval A, Giffard-Mena I, Abadía-Cardoso A, Chong-Robles J, Lago-Lestón A; Universidad Autónoma de Baja California, Centro de Investigación Científica y de Educación Superior de Ensenada |
| 28-2 | Feeding preferences of red sea urchins (<i>Mesocentrotus franciscanus</i>) in the Salish Sea | Calhoun JA, Dobkowski K; Bates College |
| 28-3 | Interspecific isotopic niche differentiation among Darwin's finches in Santa Cruz Island, Galápagos | Villegas M, Hobson KA, Soos C, Jiménez-Uzcátegui G; University of Saskatchewan, University of Western Ontario, Environment and Climate Change Canada, Estación Biológica Charles Darwin, Puerto Ayora |
| 28-4 | Kleptoplastic sea slug <i>Elysia papillosa</i> prefers algae that provides inferior growth and photosynthesis | Middlebrooks ML, Nockengost A, Ambrosio LJ; University of Tampa |
| 28-5 | Feeding preferences of <i>Pugettia producta</i> on macroalgae species along the coast of San Juan Island, Washington | Dittrich MC, Dobkowski KA; University of Washington |
| 28-6 | Factors affecting respiration and water processing by deep-sea sponges | Kahn AS, Daniels J, Lord JP, Katija K, Barry JP; Moss Landing Marine Laboratories, San Jose State University, MBARI, Moravian College |
| 28-7 | The HBOI-FAU marine biotechnology reference collection: a new web-based resource for research | Pomponi SA, Hanisak MD, Reed JK, Wright AE; Florida Atlantic University |
| 28-8 | Evidence of a deep-sea, Antarctic lineage of burrowing sea anemones (Cnidaria: Actiniaria): an evaluation using mitogenomics | Gusmão LC, Rodríguez E; American Museum of Natural History |
| 28-9 | Description of four new species of hagfishes from the Galapagos Islands, Ecuador | Fudge DS, Plachetzki DC, McCord CL, Winegard TM, Fernholm B, Gonzalez CJ, Mincarone MM; Chapman University, University of New Hampshire, California State University Dominguez Hills, Swedish Museum of Natural History, Universidade Federal do Rio de Janeiro |
| 28-10 | Head shape is constrained by body size and sexually selected traits in <i>Sceloporus</i> lizards | Rivera JA, Fuentes-G. JA, Martins EP; Arizona State University Tempe, University of Alabama Tuscaloosa |
| 28-11 | Abundance and genetic variation in populations of the introduced milkweed aphid in eastern North America | Cahill AE, Rollinson EJ, Corona-Avila I, Ferrero K, Holmer K, Mayo P, Deecher E, Billman B, Siryani N; Albion College, East Stroudsburg University, Penn State University |

Session 29

Comparative Genomics

Chair: Aida Verdes

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| 29-1 | Visualization of toxin gene expression patterns in ribbon worm tissue sections by spatial transcriptomics | Verdes A, Saarenpää S, Junoy J, Riesgo A, Giacomello S; Natural History Museum, Museo Nacional de Ciencias Naturales, Science for Life Laboratory, Universidad de Alcalá |
| 29-2 | Morphological and genomic evolution of pelagic thresher shark tapeworms | Gallagher KA, Caira JN, Wegrzyn J; Christian Brothers University, University of Connecticut |
| 29-3 | Large-scale characterization of non-coding conserved elements across the Metazoa | Gonzalez P, Baxeavanis AD; National Institutes of Health |
| 29-4 | Insights from the draft genome assembly for the hydrozoan <i>Podocoryna carnea</i> : Just the tip of the tentacle | Chang ES, Traver M, Sanders SM, Klompen AML, Gonzalez P, Barreira SN, Cartwright P, Baxeavanis AD; NHGRI/NIH, University of Kansas, University of Pittsburgh |

Contributed Talks

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| 29-5 | Assigning rural and urban origin to burrowing owls (<i>Athene cunicularia</i>) using traditionally omitted genomic data | Zaragoza G, Fitak RR, Robson C; University of Central Florida |
| 29-6 | Deeply altered genome architecture in the iconic endoparasitic flowering plant <i>Rafflesiaceae</i> | Cai L, Arnold B, Xi Z, Khost D, Patel N, Hartmann C, Manickam S, Sasirat S, Nikolov LA, Mathews S, Sackton T, Davis CC; Harvard University, Sichuan University, University of Connecticut, University of Malaya, Queen Sirikit Botanic Garden, University of California Los Angeles, Louisiana State University |
| 29-7 | Differential gene expression in an invasive ascidian as a response to temperature | Shipman BM, Ernst DA, Dijkstra JA, Westerman EL; University of Arkansas, University of Texas Dallas, University of New Hampshire |
| 29-8 | No vagina, one vagina, or multiple vaginae? An integrative study of <i>Pseudaxine trachuri</i> (Monogenea, Gastrocotylidae) leads to a better understanding of the systematics of <i>Pseudaxine</i> and related genera | Bouguerche C, Tazerouti F, Delphine G, Justine JL; Université des Sciences et de la Technologie Houari Boumediene, Muséum National d'Histoire Naturelle |
| 29-9 | Evolution of DNA methylation in Cnidaria | Zhang P, Jacobs D; University of California Los Angeles |
| 29-10 | The Acoelomorphan circadian clock reveals a critical point at which the PER/CRY heterodimer evolved as the negative regulator in Animalia | Stanton DS, Hurlbert JC, Smith JP; University of Florida, Winthrop University |

Session 30

Comparative, Environmental & Behavioral Endocrinology

Chair: Carolyn Bauer

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| 30-1 | Preparation, departure, and flight: review of evidence for corticosterone's roles in avian migration | Bauer CM, Watts HE; Swarthmore College, Washington State University |
| 30-2 | Variation in androgen receptor sequence corresponds to variation in androgen responsiveness across two ghost knifefish species | Proffitt MR, Smith GT; Indiana University |
| 30-3 | Associations between multiple physiological mechanisms within an individual | McMahon EK, Youatt E, Cavigelli S; Pennsylvania State University |
| 30-4 | Hair cortisol for non-invasive health evaluation in the big brown bat, <i>Eptesicus fuscus</i> | Jorgensen MA, Hews DK; Indiana State University |
| 30-5 | Telomere length explains interindividual variation in physiological and behavioral responses to experimentally-induced declines in local food availability in free-living seabirds | Benowitz-Fredericks ZM, Lacey LM, Whelan S, Will AP, Hatch SA, Kitaysky AS; Bucknell U, Penn State U, McGill U, U Alaska Fairbanks, Inst. Seabird Res and Cons |
| 30-6 | The role of testosterone in regulating the movement behaviours of juvenile migrant songbirds | Casbourn GW, Posliff C, Henry C, MacDougall-Shackleton E, MacDougall-Shackleton S; University of Western Ontario |
| 30-8 | Thinking hard: Measuring physiological and neuroendocrine responses to problem-solving challenges in a captive avian social system | Myers DC, Davis JE; Radford University |
| 30-9 | Adrenal melatonin 1a receptor (Mel1aR) signaling regulates territorial aggression in male Siberian hamsters (<i>Phodopus sungorus</i>) | Munley KM, Dutta S, Jasnow AM, Demas GE; Indiana University, Kent State University |

Session 31

Conservation Biology

Chair: Melissa Bernhard

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| 31-1 | Water quality determinants of the density of zooplankton subsidies from polymictic reservoirs to streams | Ruhl NA, Ruggiero DA, Iulicucci SC, Rollo FA, Grove MW, Richmond CE; Rowan University |
| 31-2 | Can eDNA be used to estimate biomass? A Case Study for Using <i>Carcinus maenas</i> | Danziger AM, Frederich M; University of New England |
| 31-3 | Testing the role of hormone-driven chemical signals in Burmese python trailing behavior | Nazarian LA, Bukovich IMG, Currylow AF, Josimovich JJ, Robinson CJ, Nafus MG, Yackel Adams AA, Parker MR; James Madison University, USGS Ft. Collins Science Center |
| 31-4 | Environmental DNA detection method from soil samples for Eastern Indigo snakes (<i>Drymarchon couperi</i>) | Galbraith E, Santamaria C, Hoffman M, Gainsbury A; University of South Florida, Orianne Center for Indigo Conservation |

Contributed Talks

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| 31-5 | Intrinsic effects on neonate survival of an invasive large mammal | Chinn SM, Kilgo JC, Vukovich M, Beasley JC; University of Georgia, USDA Forest Service Southern Research Station |
| 31-6 | Social interactions of intraspecies pairs of Australian crayfish <i>Cherax quadricarinatus</i> and interspecies pairs of Louisiana red swamp crayfish <i>Procambarus clarkii</i> : Invasive species alert | Jacobs G, Shenoy K, Srinivasan M, Cooper R; University of Kentucky |
| 31-7 | Assessing the impact of hunting on the vertebrate community and the lesula monkey (<i>Cercopithecus lomamiensis</i>) in the Lomami National Park and buffer zone, Democratic Republic of the Congo | Fournier CS, Hart JA, Hart TB, Detwiler KM; Florida Atlantic University, Frankfurt Zoological Society |
| 31-8 | Using physiological measures of captive seals to inform best practices of rapid body condition assessments of wild Arctic seals | Hartwick M, Reichmuth C, Thometz N; University of San Francisco, UC Santa Cruz, Alaska SeaLife Center |
| 31-9 | To cage or not to cage? Effectiveness of caging sea turtle nests on Gulf of Mexico beaches | Mazzarella KT, Bernhard MC; Mote Marine Laboratory |
| 31-10 | Impacts of a geotextile container on loggerhead sea turtle nesting in the Gulf of Mexico | Bernhard MC, Hirsch SE, Perrault JP, Lasala JA; Mote Marine Laboratory, Loggerhead Marinelife Center |

Session 32

Coral Reef Biology

Chair: Marie Strader

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| 32-1 | Genetic diversity of the mustard hill coral (<i>Porites astreoides</i>) along the Florida Keys Reef Tract | Gallery DN, Green ML, Kuffner IB, Lenz EA, Toth LT; US Geological Survey, University of South Florida, University of Hawai'i at Manoa |
| 32-2 | Genetic diversity and reproductive strategies in <i>Porites porites</i> , a candidate brooding species for coral restoration | Chamberland VF, Latijnhouwers KRW, Ritson-Williams R, Willis SC, Albright R; California Academy of Sciences, SECORE International |
| 32-3 | Coral connectivity on the Belize Barrier Reef: Water clarity, not temperature, drives genetic differentiation in <i>Siderastrea siderea</i> | Rippe JP, Moreland KN, Baumann JH, Aichelman HE, Castillo KD, Davies SW, Matz MV; University of Texas at Austin, Bowdoin College, Boston University, University of North Carolina at Chapel Hill |
| 32-4 | Nitrate enrichment has lineage specific effects on <i>Pocillopora</i> adults, but little carry-over effects in larvae | Strader ME, Speare KE, Howe-Kerr LI, Correa AMS, Hofmann GE; Auburn University, University of California Santa Barbara, Rice University |
| 32-6 | Ghosts of coral past: Applications of ancient dna methodology to caribbean coral reef cores | Scott CB, Toth L, Rohland N, Mah M, Reich D, Matz M; University of Texas, U.S. Geological Survey, St. Petersburg Coastal & Marine Science Center, Harvard Medical School, Broad Institute of Harvard, MIT |
| 32-7 | Biogeography of soft corals in the Indo-Pacific assessed using DNA barcodes | Lane A, Benayahu Y, McFadden CS; Harvey Mudd College, Tel Aviv University |
| 32-8 | Testing the resilience of coral microbial networks to disturbance | Krieffall NG, Rippe JP, Castillo KD, Davies SW; Boston University, UT Austin, UNC Chapel Hill |
| 32-9 | Size-selective mortality in the large bodied sponge <i>Ircinia campana</i> and changes in mesograzers crustacean populations and communities after Hurricane Irma in the Florida Keys | Lebeck B, Kiefer V, Winkler M, Eareckson C, Lippert M, Hill M*; University of Richmond, Bates College |

Session 33

Coral Reefs and Climate Change

Chair: Colleen Bove

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| 33-1 | Coral host recovery and resistance strategies following a thermal bleaching event in French Polynesia | Leinbach SE, Speare KE, Strader ME; Auburn University, University of California Santa Barbara |
| 33-2 | Cryptic lineages matter for coral conservation under climate change | Gómez-Corrales M, Prada C; University of Rhode Island |
| 33-3 | Physiological and transcriptomic responses of Caribbean corals under global change | Bove CB, Davies SW, Ries JB, Umbanhowar J, Castillo KD; UNC Chapel Hill, Boston University, Northeastern University |
| 33-4 | Hot and bothered: Determining the effects of heat and starvation stress on <i>oculina arbuscula</i> corals | Dickerson HEW, Rivera HE, Davies SW*; Boston University |

Contributed Talks

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| 33-5 | Effects of land-based sources of pollution on coral thermotolerance | Naugle M, Grossman J, Logan C; California State University |
| 33-6 | Effects of divergent temperature stress on microbial communities in <i>Oculina arbuscula</i> | Weldon JK, Rivera HE, Davies SW; Boston University |
| 33-7 | Symbiotic state influences transcriptional responses of facultatively symbiotic corals in response to thermal challenges | Wuitchik DM, Aichelmann HE, Atherton KF, Kriefall NG, Tramonte CA, Davies SW; Boston University, Boston College |
| 33-8 | Do high heat resistant corals have lower recovery rates from bleaching? | Walker NS, Palumbi SR; Stanford University, Hopkins Marine Station |
| 33-9 | Shallow hypoxia on diverse tropical reef systems is an underestimated threat for marine ectotherms | Lucey NM, Haskett E, Collin R; Smithsonian Tropical Research Institute |

Session 34

Determinants of Metabolic Rate

Chair: Bernard Rees

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| 34-1 | Metabolism of small groups of fire ants workers scale isometrically | Komilian K, Ko H, Waters J, Hu D; Georgia Institute of Technology, Providence College |
| 34-2 | Evaluating methods to determine maximum oxygen consumption by Gulf killifish, <i>Fundulus grandis</i> | Mullen SC, Knecht KJ, Rees BB; University of New Orleans |
| 34-3 | Individual variation in standard and maximum metabolic rate correlates with gill morphology and cardiac bioenergetics | Rees BB, Reemeyer JE, Irving BA; University of New Orleans, McGill University, Louisiana State University |
| 34-4 | Active and resting metabolic rate scaling relationships in fishes across ecologies, salinity, and body shapes | Kraskura K, Jerde CL, Eliason EJ; University of California Santa Barbara |
| 34-5 | Inferring whole-organism metabolic rate from red blood cells? Yes, in non-stressed birds | Malkoc K, Casagrande S, Hau M; Max Planck Institute for Ornithology |
| 34-6 | All in? No effect of meal size on postprandial metabolic rates in Children's pythons | Bow HF, Campbell TM, Gonzales ES, Michels LG, Schwartz SR, Liwanag HEM, Strand CR; Cal Poly State U |
| 34-7 | Oxygen consumption during embryonic development in the oviparous snake, <i>Pantherophis guttatus</i> | Gallardo CR, Stewart JR, Bidwell JR; East Tennessee State University |
| 34-8 | Selective breeding for voluntary exercise partially supports the aerobic capacity model for the evolution of endothermy | Schwartz NL, McNamara MP, Rashid JO, Garland Jr T; University of California Riverside |

Session 35

Development of Behavior

Chair: Robert Fitak

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| 35-1 | Behavior of the encapsulated embryos of little skates, <i>Leucoraja erinacea</i> | McShaffrey C, Forbes E, Long JH; Vassar College |
| 35-2 | Developmental environment has lasting effects on amphibian behavior and thermal physiology | Ohmer MEB, Hammond TT, Switzer S, Paciotta E, Coscia J, Richards-Zawacki CL; Washington University in St. Louis, University of Pittsburgh |
| 35-3 | The effects of short- and long-term environmental enrichment on exploratory behaviors in Trinidadian guppies (<i>Poecilia reticulata</i>) | Iffert RQ, Stein LR; University of Oklahoma, Colorado State University |
| 35-4 | Embryonic environmental cues alter behavioral responsiveness but not performance in larval fathead minnow (<i>Pimephales promelas</i>) | Crowder C, Ward J; Ball State University |
| 35-5 | Behavioral development and the emergence of adult phenotype in a highly social fish | Solomon-Lane TK, Wallace KJ, Butler RM, Hofmann HA; Pitzer, Scripps, and Claremont McKenna Colleges, University of Texas at Austin, University of Chicago |
| 35-6 | Cognitive biomechanical decisions to negotiate unstable branches in fox squirrels | Ruopp R, Wang L, Lee S, Full R; University of California Berkeley |
| 35-7 | Development of the O ₂ sensing system in an amphibious fish | Cochrane PV, Jonz MG, Wright PA; University of Guelph, University of Ottawa |

Contributed Talks

- 35-8** Determinants and influences of infant spatial relationships with adult males in wild baboons: a mechanism for intergenerational transmission of early adversity? *Zipple MN, Southworth CA, Clinton SP, Archie EA, Alberts SC; Duke University, University of Notre Dame*
- 35-10** Influences on nest and latrine decision-making in meadow voles *Rohrer KN, Ferkin MH; University of Memphis*

Session 36

Disparity and Diversification

Chair: Samantha Price

- 36-1** Functional morphology and diversification of the mustelid hindlimb skeleton and potential influence of differing limb functions *Kilbourne BM; Museum für Naturkunde Berlin*
- 36-2** Feeding mode underlies the major axis of body shape diversity in reef fishes *Corn KA, Friedman ST, Martinez CM, Larouche O, Price SA, Wainwright PC; University of California Davis, Yale University, Rice University, Clemson University*
- 36-3** The parrotfish beak leads to shifts in cranial integration patterns and increased morphological disparity *Larouche O, Gartner SM, Westneat MW, Evans KM; Rice University, University of Chicago*
- 36-4** How fishes change their size and how such changes impact clade-level dynamics *Alencar LRV, Friedman ST, Wainwright PC, Price SA; Clemson University, University of California Davis*
- 36-5** Does pharyngognathly unlock body shape diversification in acanthomorph fishes? *Larouche O, Hodge JR, Alencar LRV, Camper B, Adams DS, Zapfe K, Friedman ST, Wainwright PC, Price SA; Clemson University, Yale University, University of California Davis*
- 36-6** Absolute fitness explains evolutionary patterns at the micro and macro levels *Wynd BM, Uyeda JC; Virginia Tech*
- 36-7** Forelimb functional diversity in Didelphimorphia and Diprotodontia is not strongly limited by developmental constraints *Pevsner SK, Grossnickle DM, Luo Z-X; University of Bristol, University of Washington, University of Chicago*
- 36-8** Tesseral development provides insights into evolution of mineralization patterns in jawed vertebrates *Atake OJ, Eames BF; University of Saskatchewan*
- 36-9** Stick together and act as if you belong: ontogeny and evolution of gill arches of Batrachoidiformes *Vaz DB, Hilton EJ; Museum of Comparative Zoology, Harvard University, Virginia Institute of Marine Science, William and Mary*
- 36-10** Evolution of elaborate nest design in the Old World weavers (Ploceidae) *Childers JL, Bowie RCK; UC Berkeley*

Session 37

Eco-Evo-Devo & Life-History Transitions

Chair: Jessica Goodheart

- 37-1** Bacterial induced metamorphosis: holes in excitable membranes? *Nedved BT, Freckelton MF, Hadfield MG; University of Hawaii at Manoa, Kewalo Marine Laboratory*
- 37-2** Identifying recruitment sites: How important are bacterial strain differences to invertebrate larvae? *Freckelton ML, Knowles AF, Nedved BT, Hadfield MG; University of Hawaii at Manoa*
- 37-3** Shape Variation Within Morphs and Between Species of Soapberry Bug *Yorsz MC, Angelini DR; Colby College*
- 37-4** Reproductive maturity occurs before transition to adult morphology in the ctenophore Mnemiopsis leidyi *Edgar A, Martindale MQ; University of Florida*
- 37-5** Effect of juvenile hormone on firebrat (Thermobia domestica) embryos *Truman JW, Konopova B, Riddiford LM; University of Washington, Biology Centre Czech Academy of Sciences*
- 37-6** Cellular reprogramming and immortality: Expression profiling reveals genes involved in Turritopsis dohrnii's life cycle reversal *Matsumoto Y, Miglietta MP; Texas A&M University Galveston*
- 37-7** The role of retinoic acid in the development of an unusual tadpole stomach in the Budgett's frog, Lepidobatrachus laevis *Austiff JK; Harvard University*
- 37-8** Investigating the molecular mechanisms of nematocyst sequestration in the emerging nudibranch model Berghia stephanieae *Goodheart JA, Bigasin A, Lyons DC; UC San Diego*

Session 38

Ecomorphology I

Chair: *Tristan Stayton*

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| 38-1 | Master of one or none: Functional morphology and microhabitat preference of arboreal and saxicolous gecko populations | Schwarz R, Stark G, Antonopolous A, Itescu Y, Pafilis P, Chapple DG, Meiri S; Tel Aviv University, National and Kapodistrian University of Athens, Freie Universität Berlin, Monash University, Steinhardt Museum of Natural History |
| 38-2 | Claw morphology impacts frictional interactions on rough substrates | Pamfilie AM, Garner AM, Russell AP, Dhinojwala A, Niewiarowski PH; Stony Brook University, University of Akron, University of Calgary |
| 38-3 | Location, location, location: Lizard sprint speed in various environments demonstrates morphology-performance trade-offs | Vaughn PL, McQueen W, Gangloff EJ; Ohio Wesleyan University |
| 38-4 | Geographic variation in the ecomorphology and thermal ecology of a widespread lizard | Lattanzio MS, McCann M, Manion M; Christopher Newport University |
| 38-5 | Modular architecture in lizard autopodia: Relationships with microhabitat usage in Tropiduridae (Squamata) | Kyomen SM, Simon MN, Kohlsdorf T; University of Sao Paulo |
| 38-6 | Ecomorphology of pelvis shape in lizards | McElroy EJ, Faust S; College of Charleston |
| 38-7 | Biomechanics and morphological patterns in head-first burrowing frogs | Vidal-Garcia M, Marcé-Nogué J, Marchini M, Fortuny J, Semple TL, Cooper P, Keogh JS; Australian National University, University of Calgary, Universitat Rovira i Virgili, Institut Català de Paleontologia Miquel Crusafont |
| 38-8 | Ecomorphology of penguins in the genus <i>Spheniscus</i> | Bloom EJ; California State University Northridge |
| 38-9 | The effect of climate on bill morphology divergence in <i>Toxostoma</i> thrashers | Probst CM, Ralston J, Bentley I; University of Notre Dame, Saint Mary's College |
| 38-10 | Un-sheathed: ungual vs. keratin structure and function in raptors | Coon T, Peragine P, Chase HT, Tobalske B; University of Montana, Montana State |
| 38-11 | Geometric morphometric analysis of foot pad shape of salt marsh harvest mice and co-occurring rodents in the Suisun Marsh, California | Robles Martinez D, Sustaita D; California State University San Marcos |

Session 39

Ecomorphology II

Chair: *Kate Riordan*

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| 39-1 | Consistent but weak evolutionary correlation between predator bite force and turtle shell strength: complex selection in a simple defensive armor | Stayton CT; Bucknell University |
| 39-2 | Ecomorphological variation in shell shape of stripe-necked musk turtles (<i>Sternotherus peltifer</i>) | Welc M, Wolak ME; Auburn University |
| 39-3 | Bringing fossils back to life: 3D cranial reconstructions of the highly flattened remains of <i>Thalattosauriformes</i> | Bastiaans D, Herbst EC, Scheyer TM; University of Zurich Switzerland |
| 39-4 | Morphological evolution in relation to sidewinding, arboreality, and precipitation in snakes of the family <i>Viperidae</i> | Tingle JL, Garland T; University of California Riverside |
| 39-5 | The evolution of body shape in terrestrial tetrapods | Maher AE, Cox PG, Maddox TW, Bates KT; University of Liverpool, University of York |
| 39-6 | Linking body form to ecological function in coral reef fishes | Hodge JR, Friedman ST, Wainwright PC, Price SA; Clemson University, Yale University, University of California Davis |
| 39-7 | Vertebrate growth plasticity in response to variation in a mutualistic interaction | Rueger T, Bardwaj A, Turner E, Buston P; Boston University |
| 39-8 | Biology-guided neural network for fish trait discovery | Maruf MA, Elhamod M, Mandke PK, Karpatne A; Virginia Polytechnic Institute and State University |
| 39-9 | Measuring craniofacial variability in zebrafish using computational anatomy | Diamond KM, Kwon RY, Maga AM; Seattle Children's Research Institute, University of Washington |
| 39-10 | Three-dimensional shape analysis with no landmarks: Insights from marine mammal vaginas | Orbach DN, Brassey CA, Gardiner JD, Brennan PLR; Texas A&M University-Corpus Christi, Manchester Metropolitan University, University of Liverpool, Mount Holyoke College |

Contributed Talks

39-11 SlicerMorph: A toolkit for morphometric analysis of high-resolution specimen data

Rolfe SM, Porto A, Pieper S, Winchester J, Boyer D, Summers A, Maga AM; University of Washington Seattle, Seattle Children's Research Institute, Isomics Inc, Duke University

Session 40

Ecomorphology III

Chair: Jenny Gumm

40-1 Thermal biomechanics

Olberding JP, Deban SM; University of California Irvine, University of South Florida

40-2 The morphology and thermal function of sea otter pelts across ontogeny

Riordan KC, Levin E, Thometz NM, Batac F, Liwanag HEM; California Polytechnic State University, University of San Francisco, California Department of Fish and Wildlife

40-3 Tied to the tide: developmental differences in sculpin species

West J J, Evans K M; Rice University

40-4 Turbot boosted: rapid and mosaic patterns of shape evolution in the flatfish skull

Evans KM, Watson S, Friedman M; Rice University, New Mexico Tech University, University of Michigan

40-5 It's complicated: Examining convergent evolution of craniofacial morphologies in apteronotid and mormyrid electric fishes

Ford KL, Bernt MJ, Peterson R, Albert JS; University of Louisiana at Lafayette, American Museum of Natural History, George Washington University

40-6 Growth rates and morphology of wild, refuge and lab derived Devils Hole pupfish (*Cyprinodon diabolis*)

Gumm JM, Stanton MR, Feuerbacher OG; US Fish and Wildlife Service

40-7 Morphological based relationships of the Molidae family supported by molecular phylogeny and 3D geometric morphometrics

Biondi AA, Kellogg JE, Ruane S, Amplo HE, Crawford CH, Flammang BE; New Jersey Institute of Technology, Rutgers University

40-8 Ontogenetic change in performance: do innovations constrain performance?

Schoenfuss HL, Diamond KM, Lagarde R, Blob RW; St. Cloud State University, Seattle Children's Research Institute, Université de Perpignan Via Domitia, Clemson University

40-9 Effects of free versus tethered food presentation on axolotl strike velocity

Panessetti C E, Albert A, Konow N; University of Massachusetts Lowell

Session 41

Education

Chair: Aaron Olsen

41-1 Translating fish skull science into a product: My first year launching an employee-owned animal anatomy and mechanics bio-design company

Olsen AM; Brown University

41-2 Coconuts not included: Merging art with real data to animate bird flight

White BJ, Jackson BE; Longwood University

41-3 Transforming the undergraduate curriculum – engaging first year students in authentic research experiences

Cohen RE, Land AM, Martensen BF, Sharlin DS, Smith BA; Minnesota State University

41-4 The effect of learning space management on student engagement

Steffenson MM, Lucas L; St. Edward's University

41-5 Teaching during a pandemic: observations of students' reactions to different teaching formats

Kissane KC; Trinidad State Junior College

41-6 Four years of community-engaged learning in a summer undergraduate research program: successes and lessons learned

Woodley SK; Duquesne University

41-7 Royal Scholars: An NSF S-STEM program to support science identity in low-income STEM students in Pennsylvania

Voltzow J, Karpiak CP, Mulhall D, Muir S; University of Scranton

41-8 Exploring the nature and process of science with abnormal frogs

Sanders BC, Ruhl N; Rowan University

41-9 Developing LGBTQIA+ inclusive biology content and classrooms

Sharpe SL; Kansas State University

41-10 Can we teach the learning objectives of an animal physiology lab online?

Harrison JF, Henry JR, Ostwald M, Glass JR; Arizona State University

Contributed Talks

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| 41-11 | Crescent Loom: Weaving and unravelling biophysical motor circuits in an online learning activity | Perry O, Zornik E; Reed College |
| 41-12 | How is COVID19 affecting scientific publishing – a study of a conference-proceedings journal | Ilyas Z, Brar N, Shin J, Hansen AK, Telemeco RS, Müller UK*; CSU Fresno |
| 41-13 | Teaching a women-in-science course: lessons from a biologist | Challener RC; Bellarmine University |

Session 42

Endocrine Stress I

Chair: Jenny Ouyang

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| 42-1 | Intrinsic and extrinsic factors contributing to variation in telomere length in neonatal alligators | Bertucci EM, Bae J, Bock SL, Hale MD, Moore JA, Wilkinson PM, Rainwater TR, Bowden JA, Koal T, PhamTuan H, Parrott BB; U. of Georgia, Augusta U., U. of Virginia, Benedict College, Tom Yawkey Wildlife Center, Clemson U., U. of Florida, Biocrates Life Sciences |
| 42-2 | What determines an urban bird? Genetic inheritance and endocrine plasticity | Ouyang JQ; University of Nevada Reno |
| 42-3 | Corticosterone levels in the saliva as a measure of stress in toads | Madelaine CB, Dillon D, Barsotti AMG, Measey J, Gomes FR, Buck CL; Northern Arizona University, University of São Paulo, Stellenbosch University |
| 42-4 | An indomitable invader? Physiological tolerance across diverse early-life stressors in an invasive treefrog | Wilcoxon TE, Albin M, Giannuzzi K, Koch N, Lukens E, Phillips A, Spence J; Millikin University |
| 42-5 | A decade of field-physiology reveals life-history specific profiles in garter snakes (<i>Thamnophis elegans</i>) | Holden KG, Sparkman AM, Miller DA, Bronikowski AM; Iowa State University, Westmont College, Pennsylvania State University |
| 42-6 | Acute and chronic HPA axis stimulation alters white blood cell ratios but not inflammatory markers or oxidative stress in elephant seals | Ensminger DC, Crocker DE, Lam EK, Allen KN, Vázquez-Medina JP; UC Berkeley, Sonoma State University |
| 42-7 | Elephant seal muscle cells adapt to sustained glucocorticoid exposure by shifting their metabolic phenotype | Torres-Velarde JM, Kolora SRR, Khudyakov JI, Crocker DE, Sudmant PH, Vázquez-Medina JP; University of California Berkeley, University of the Pacific, Sonoma State University |
| 42-8 | Response of <i>Mytilus californianus</i> ciliary activity to food and temperature acclimation and sirtuin inhibition | Fabela RF, May MA, Todgham AE, Tomanek L; California Polytechnic State University, Florida Gulf Coast University, University of California Davis |
| 42-9 | The oxidative costs of unpredictable environments | Guindre-Parker S, Rubenstein DR; Kennesaw State University, Columbia University |
| 42-10 | Differences in morphology and parotoid gland secretion (composition and release) of introduced cane toads (<i>Rhinella marina</i>) from established populations in Florida, USA | Gardner S, Kepas M, Simons C, Horne LM, Savitzky A, Mendonça M; Auburn University, Utah State University, University of Texas at El Paso |

Session 43

Endocrine Stress II

Chair: Jennifer Grindstaff

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| 43-1 | Chronic stress influences defensive toxin production in toad tadpoles | Üveges B, Kalina C, Szabó K, Móricz ÁM, Gabor CR, Hettyey A, Bókony V; Plant Protection Institute, Centre for Agricultural Research (PPI-CAR), University of Debrecen, Texas State University |
| 43-2 | Short-term stressors and corticosterone treatment effects on toad's immunity | Titon SCM, Titon Jr B, Gomes FR, Assis VR; University of Sao Paulo |
| 43-3 | Retrospective analysis of the lifetime endocrine response of southern right whale calves to gull wounding and harassment: a baleen hormone approach | Fernandez Ajó AA, Hunt KH, Sironi M, Uhart M, Rowntree V, Giese AC, Marón CF, DiMartino M, Dillon D, Buck CL; Northern Arizona U, Smithsonian-Mason School of Conservation, Southern Right Whale Health Monitoring Program, U of California Davis, U of Utah, Centro Nacional Patagónico CONICET, Diversidad Biológica IV, UN Córdoba |
| 43-4 | Mathematical modeling reveals the speed of endocrine flexibility constrains baseline and stress-induced glucocorticoid levels | Luttbeg B, Beaty LE, Ambardar M, Grindstaff JL*; Oklahoma State University, Penn State Erie, Fort Hays State University |
| 43-5 | How FKBP5 expression is affected by acute and chronic stress and relates to glucocorticoids levels in house sparrows | Zimmer C, Hanson HE, Martin LB; University of South Florida |

Contributed Talks

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| 43-6 | Temperature-induced priming of the glucose response to subsequent challenges | Ryan TA, Taff CC, Zimmer C, Vitousek MN; Cornell University |
| 43-7 | What happens when the stressor ends? A study of corticosterone in wild Antarctic seabirds | Angelier F; Centre d'Etudes Biologiques de Chizé |
| 43-8 | Dynamic Bayesian network models of Arabidopsis thaliana transcriptome time series data reveals possible role for HyPRPs in systemic acquired resistance | Filzen RC, Banday Z, Greenberg JT; University of Chicago |
| 43-9 | The effects of paternal deprivation on stress-induced corticosterone levels of zebra finch offspring | Riley AK, Grindstaff JL; Oklahoma State University |

Session 44

Endocrinology: Reproduction, Growth & Development

Chair: Stephen Ferguson

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| 44-1 | Can exposure to methylmercury affect songbirds' seasonal response to spring photoperiod? | Bottini CLJ, MacDougall-Shackleton SA; University of Western Ontario |
| 44-2 | Male-derived copulatory plugs enhance implantation success in <i>Mus musculus</i> | Lough-Stevens M, Ghione C, Urness M, Hobbs A, Sweeney C, Dean MD; University of Southern California |
| 44-3 | Quantification of urinary sex steroids in the big brown bat (<i>Eptesicus fuscus</i>) | Greville LJ, Bueno LM, Pollock T, Faure PA; McMaster University, University of São Paulo |
| 44-4 | Fasting inhibits GH stimulation of IGF-1 synthesis pathways in the liver of gopher rockfish (<i>Sebastes carnatus</i>) | Bersin TB, Cordova KL, Journey ML, Beckman BR, Lema SC; Cal Poly San Luis Obispo, NOAA Fisheries |
| 44-5 | Decoupling the effects of thermal and hormonal stimuli on intron retention in a species with temperature-dependent sex determination | Marroquin-Flores RA, Paitz RT, Bowden RM; Illinois St U |
| 44-6 | Incubation behavior differences in urban and rural house wrens, <i>Troglodytes aedon</i> | Heppner JJ, Ouyang JQ; University of Nevada Reno |
| 44-7 | The effects of ethinylestradiol on estrogen-regulated neurogenic pathway in adult zebrafish (<i>Danio rerio</i>) | Campbell M, Alderman S, Van Der Kraak G; Trent University, University of Guelph |
| 44-8 | Influence of testosterone on pre- and post-copulatory dimensions of male-male competition in the red-sided garter snake, <i>Thamnophis sirtalis parietalis</i> | Bukovich IMG, Friesen CR, Parker MR; James Madison University, University of Wollongong |
| 44-9 | A breeding-like transition occurs prior to changes in environmental conditions in a lizard species | Tao CY, Cohen RE; Minnesota State University |
| 44-10 | How caterpillars assess size: The role of the TGF-beta/Activin ligand Myoglianin in triggering metamorphosis | He LL, Shin SH, Wang Z, Yuan I, Weschler R, Chiou A, Koyama T, Nijhout HF, Suzuki Y; Wellesley College, Instituto Gulbenkian de Ciência, Portugal, University of Copenhagen, Duke University |
| 44-11 | Can mating behaviors be maintained in the face of elevated prolactin levels driving parental care? Revisiting the anti-gonadal effect | Farrar VS, Flores L, Ornelas Pereira L, Mushtari S, Viernes RC, Calisi RM; University of California Davis |

Session 45

Energetics

Chair: David Swanson

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| 45-1 | Food for thought: What happens to fructose in the ruby-throated hummingbird? | Muhammad S, Morag MF, Welch KC; University of Toronto |
| 45-2 | The zombification and revival of purple sea urchins (<i>Strongylocentrotus purpuratus</i>) in response to food availability | Dolinar DP, Edwards MS; San Diego State University |
| 45-3 | Thermoregulatory tactics and water balance of flying metander <i>Centris caesalpiniae</i> males | Johnson MG, Glass JR, Harrison JF; Arizona State University |
| 45-4 | High resolution heart rate data reveal novel energy saving strategy in temperate-zone bats | Keicher L, Shipley JR, Komar E, Schaeffer PJ, Dechmann DKN; Max Planck Institute of Animal Behavior, Polish Academy of Sciences, Miami University |
| 45-5 | Lipid composition of bumble bees and their pollen diets: bees are (mostly) what they eat | Keaveny EC, Rowe E, Rule DC, Dillon ME; University of Wyoming |

Contributed Talks

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| 45-6 | The more the lazier: Overwintering aggregations reduce energy use in the ladybird beetle <i>Hippodamia convergens</i> | Szejner-Sigal A, Williams CM; University of California Berkeley |
| 45-7 | Suppress to impress: Mechanisms underlying diapause and metabolic suppression in the Colorado potato beetle | Lebenzon JE, Sinclair BJ; Western University |
| 45-8 | High carbohydrate diets result in respiratory exchange ratios above 1 and increased lipid synthesis in locusts | Tatal S, Cease AJ, Harrison JF; Arizona State University |
| 45-9 | Junk in the trunk: can trees use carbohydrate reserves that are deep in the stem? | Furze ME, Huggett BA, Chamberlain CJ, Wieringa MM, Aubrecht DM, Carbone MS, Walker JC, Xu X, Czimeczik CI, Richardson AD; Harvard University, Yale University, Bates College, Northern Arizona University, University of California Irvine |
| 45-10 | Does the high-energy aerial insectivore lifestyle of swallows produce thermogenic side effects? | Zhang Y, Yap KN, David KT, Swanson DL*; University of Memphis, Auburn University, University of South Dakota |
| 45-11 | Effects of food supplementation on blood metabolites in pre-breeding seabirds | Whelan S, Hatch SA, Elliott KH; McGill University, Institute for Seabird Research and Conservation |

Session 46

Environmental Effects on Physiology

Chair: Nicholas Teets

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| 46-1 | Oxidative stress is a potential cost of synchronized nesting aggregations in olive ridley sea turtles | Arango BG, Ensminger DC, Harfush-Meléndez M, López-Reyes EM, Marmolejo-Valencia JA, Merchant-Larios H, Crocker DE, Vázquez-Medina JP; University of California Berkeley, Centro Mexicano de la Tortuga, Universidad Nacional Autónoma de México, Sonoma State University |
| 46-2 | Do aquatic insects exploit microclimates of temperature, oxygen, and flow to mitigate low-oxygen availability? | Birrell JH, Woods HA; University Montana |
| 46-3 | Microhabitat diversity influences physiology and phenology in an Antarctic insect | Teets NM, Spacht DE, Potts LJ, Gantz JD, Lee RE, Denlinger DL; University of Kentucky, Ohio State University, Hendrix College, Miami University |
| 46-4 | Hot and short of breath: High temperature and hypoxia regulates performance and habitat range in an invasive snail | King EE, Stillman JH, Williams CM; University of California Berkeley, San Francisco State University |
| 46-5 | The effect of short-term hypoxia on HIF mRNA levels in <i>Fundulus grandis</i> | Murphy TE, Rees BB; University of New Orleans |
| 46-6 | Champions of hypoxia tolerance adjust membrane cholesterol and downregulate metabolism to cope with chronically-low oxygen | Farhat E, Turenne ED, Choi K, Devereaux MEM, Pamenter ME, Weber JM; University of Ottawa |
| 46-7 | Feeling a little crabby from hunger: branchial amino acid uptake in arthropods | Griffin RA, Boyd A, Blewett TA; University of Alberta |
| 46-8 | Metabolic effects of consumption of and stings from fire ants, an invasive predator and prey of native lizards | Tylan C, Langkilde T; Pennsylvania State University |
| 46-9 | Maternal diet affects utilization of endogenous lipids by red drum embryos and early larvae | Hou Z, Fuiman LA; University of Texas at Austin, Marine Science Institute |
| 46-11 | Understanding how fiber-induced increases in gut size help to maintain optimal digestion in rodents | Peralta Martinez KY, Trevelline BK, Martinez-Mota R, Dearing MD, Derting T, Pasch B, Kohl KD; University of Pittsburgh, Cornell University, University of Utah, Murray State University, Northern Arizona University |

Session 47

Evo-Devo: Deep Homology

Chair: Nicole Webster

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| 47-1 | Nature or nurture: autonomous or conditional specification of the nervous system in spiralian | Webster NB, Meyer NP; Clark University |
| 47-2 | The developmental basis of insect tagmatization | Chipman AD; Hebrew University |
| 47-3 | Genome editing in mosquitoes reveals evolutionary handover of regulatory gene function | Cheatle Jarvela AM, Trelstad CS, Pick L; University of Maryland College Park |

Contributed Talks

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| 47-4 | Knockdown of NvSox2 causes a homeotic shift in cell identity in <i>Nematostella vectensis</i> | Babonis LS, Enjolras C, Foster BM, Hugosson F, Ryan JF, Martindale MQ; Cornell University, University of Florida, Whitney Lab |
| 47-5 | Molecular organization of rotifer neurogenesis: not a worm and not a fly | Ivashkin EG, Voronezhskaya EE, Gribble KE; MBL, IEE RAS, IDB RAS |
| 47-6 | Gene duplication and co-option in the evolution and development of the squid eye | McCulloch KJ, Neal S, Napoli F, Daly C, Coleman J, Koenig KM; Harvard University |
| 47-7 | A universal power law for the growth and form of teeth, claws, horns, thorns, beaks, and shells | Evans AR, Pollock TI, Cleuren SGC, Parker WMG, Richards HL, Garland KLS, Wilson TE, Hocking DP, Adams JW; Monash University |
| 47-8 | Apolar mode of gastrulation leads to the formation of polarized larva in a marine hydroid, <i>Dynamena pumila</i> | Vetrova AA, Bagaeva TS, Saidova AA, Kupaeva DM, Kraus YA, Kremnyov SV; Institute of Developmental Biology RAS, University of Vienna, Moscow State University |

Session 49

Evolution of Behavior

Chair: Dale Stevens

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| 49-1 | Evolution of temperature preference in the blind cavefish <i>Astyanax mexicanus</i> | Hyacinthe C; Harvard Medical School, Blavatnik Institute |
| 49-2 | Evolution of egg laying behavior in a critically imperiled freshwater gastropod family (Cerithioidea: Pleuroceridae) | Gladstone NS, Johnson PD, Whelan NV; Auburn University, Alabama Aquatic Biodiversity Center, Warm Springs Fish Technology Center, United States Fish and Wildlife Service |
| 49-3 | Field observations provide biological context for interpreting laboratory data: The locomotory performance of Bluegill Sunfish (<i>Lepomis macrochirus</i>) as an example | Wood BM, Le E, Postupaka D, Svensson K, Uhm C, Pfister P, Ellerby DJ; Wellesley College |
| 49-5 | Controlling for roost fidelity allows inference on the role of social preference in the organization of bat groups | Sunga J, Webber QMR, Humber J, Rodrigues B, Broders H; University of Waterloo, Memorial University of Newfoundland, Government of Newfoundland and Labrador |
| 49-6 | Effect of habitat quality on aggression in convict cichlid pairs | Cruz T, Bower C, Leese JM; DeSales University |
| 49-7 | Evolution of a mosquito's hatching behavior to match its human-provided habitat | Metz HC, Miller AK, You J, Kriete A, McBride CS; Princeton University |
| 49-8 | Understanding boldness variation among hybridizing black-capped and Carolina chickadees | Heuermann TM, Kozlovsky DY, Curry RL; Villanova University |
| 49-9 | Stickleback populations experiencing northern pike invasion show more among-population level variation than those without | Stevens DR, Wund MA, Baker JA, Foster SA; Clark University, College of New Jersey |
| 49-10 | Novel molecular analysis of inversion polymorphism of ZAL3 in white-throated sparrow reveals impacts on body condition and gene expression | Baran NM, Jeong H, Merritt JR, Maney DL, Yi SV; Emory University, Georgia Institute of Technology |
| 49-11 | Evidence for the independent evolution of visual perception during seafinding by hatchling leatherback sea turtles (<i>Dermochelys coriacea</i>) | Trail SE, Salmon M; Florida Atlantic University |
| 49-12 | Locomotor play behavior in selectively bred high runner mice | Whitehead N, Kelly SA, Demes JS, Garland Jr. T; University of California Riverside, Ohio Wesleyan University |

Session 50

Evolutionary Developmental Genetics

Chair: Andrew Thompson

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| 50-1 | Cytonuclear stoichiometry in the wake of genome duplication | Fernandes Gyorfy M, Conover J, Grover C, Miller E, Wendel J, Sharbrough J, Sloan D; Colorado State University, Iowa State University |
| 50-2 | Sweet genes are made of STYLISH – Members of the STYLISH gene family control both style and nectary development in Ranunculids | Min Y, Imani JI, Kramer EM; Harvard University |
| 50-3 | The genome of the bi-annual Rio pearlfish (<i>Nematolebias whitei</i>) informs the genetic regulation of diapause and environmentally-cued hatching in extreme environments | Thompson AW, Wojtas H, Davoll M, Braasch I; Michigan State University, Clemson University |

Contributed Talks

50-4	The genetic basis of orofacial features in the blind Mexican cavefish	<i>Powers AK, Tabin C; Harvard Medical School</i>
50-5	Juvenile corals inherit mutations acquired during their parent's lifespan	<i>Vasquez-Kuntz K, Kitchen S, Conn T, Vohsen S, Chan A, Vermeij MJA, Page C, Marhaver K, Baums IB; Pennsylvania State University, CARMABI Foundation, Mote Marine Laboratory</i>
50-6	Widespread changes in gene expression accompany body size evolution in nematodes	<i>Woodruff GC, Willis JH, Phillips PC; University of Oklahoma, University of Oregon</i>
50-7	Regeneration enhancers and the uneven distribution of regenerative capacities in vertebrates	<i>Wang W, Sánchez Alvarado A; Stowers Institute for Medical Research, Howard Hughes Medical Institute</i>
50-8	The long and short of it: the plant hormone brassinosteroid regulates petal spur length in <i>Aquilegia</i> by controlling cell elongation	<i>Conway SJ, Kramer EK; Harvard University</i>
50-9	The transcription factor POU-IV is required for mechanoreceptor cell differentiation and touch-response behavior in the sea anemone <i>Nematostella</i>	<i>Tamvacakis AN, Ozment ET, Nakanishi N; University of Arkansas Fayetteville</i>

Session 51

Evolutionary Ecology

Chair: Sarah Davies

51-1	The adaptive landscape for jaw morphology in heteromyid rodents	<i>Swiderski DL, Zelditch ML; University of Michigan Ann Arbor</i>
51-2	Integrating adaptive with geographic landscapes: Trophic morphology of desert rodent assemblages	<i>Zelditch ML, Swiderski DL; University of Michigan Ann Arbor</i>
51-3	Heritability of dispersal-related traits and gene expression in a coral	<i>Davies SW, Kanke MR, Aglyamova GA, Matz MV; Boston University, Cornell University, UT Austin</i>
51-4	Evolution of craniofacial morphology in a cline of Mesoamerican fishes	<i>Berning DJ, Powers AK, Garita-Alvarado CA, Rodiles-Hernández R, Gross JB, Ornelas-García CP; University of Cincinnati, Harvard Medical School, Universidad Autónoma de México, Instituto de Biología, El Colegio de la Frontera Sur</i>
51-5	Changes in morphological traits along an urbanization gradient in the cabbage white butterfly	<i>Lenard A, Diamond SE; Case Western Reserve University</i>
51-6	Demographic history of wild mandrills during periods of climatic change in Gabon	<i>Weber A, Guibinga Mickala A, Ntie S, Mickala P, Lehmann D, Abernethy KA, Anthony N; University of New Orleans, Université des Sciences et Techniques de Masuku des Sciences et Techniques de Masuku, Agence National des Parcs Nationaux, University of Stirling, CENAREST</i>
51-7	The genomics of life-history: genomic variation between life-history ecotypes of the western terrestrial garter snake (<i>Thamnophis elegans</i>)	<i>Judson JM, Bronikowski AM; Iowa State University</i>
51-8	Signal partitioning allows butterfly wing surfaces to evolve under opposing selective pressure	<i>Fredna K, Reinke BA; Northeastern Illinois University</i>
51-9	Species interactions and climate change: does thermal tolerance determine winners and losers?	<i>Shah AA, Hamant EL, Woods HA; University of Montana</i>
51-10	Climatic correlates of the diversification in Old World tree frogs: cool-wet regions and islands as refuges and species pumps	<i>Ellepolo G, Pie MR, Meegaskumbura M; Guangxi University, Universidade Federal do Paraná</i>

Session 52

Evolutionary Morphology

Chair: David Grossnickle

52-1	Sleepy gapes caught on tape: Mammalian nasal proboscis position during yawning based on an analysis of YouTube videos	<i>Miyamae JA; Yale University</i>
52-2	Testing the prevalence of morphological convergence among mammalian forelimb skeletons	<i>Grossnickle DM, Brightly WH, Law CJ, Pevsner SK, Roston RA, Stanchak KE, Weaver LN; University of Washington, University of Bristol</i>

Contributed Talks

52-3	Inter- and intraspecific variation in <i>Artibeus</i> demonstrates size and shape partitioning among species	<i>Hedrick BP; Louisiana State University Health Sciences Center</i>
52-4	ALPACA: a new and general framework for automated landmarking of 3D biological structures	<i>Porto A, Rolfe SM, Maga AM; Seattle Children's Research Institute, Friday Harbor Laboratories, University of Washington</i>
52-5	Morphological evolution of the primate hyoid apparatus	<i>Li P, Ross CF, Luo Z-X; University of Chicago</i>
52-6	Acetabular orientation and pelvic shape in hominins	<i>Lawrence AB, Hammond AS, Ward CV; University of Missouri, American Museum of Natural History, New York Consortium in Evolutionary Primatology</i>
52-7	Inside-out view in variational modularity of an actinopterygian using 3D geometric morphometrics	<i>Vanhaesebroucke O, Larouche O, Cloutier R; Université du Québec à Rimouski, Rice University</i>
52-8	The macrostructural anatomy and functional morphology of dendrochirotid sea cucumber's (Echinodermata) calcareous rings	<i>Souto C, Martins L; Smithsonian Institution, Museu de Zoologia, Universidade de São Paulo</i>
52-9	Metacarpus evolution in non-avian dinosaurs: a 2d morphometrics perspective	<i>Leite JV, Barrett PM, Goswami A; Natural History Museum, University College London</i>
52-10	Potential constraint and release driven by ancestral terrestrial posture in land-to-sea transitions: Insights from forelimbs across four land-to-sea amniote clades	<i>Formoso KK, Habib MB; University of Southern California, Natural History Museum of Los Angeles County</i>
52-11	Causes and consequences of morphological integration in the hyperkinetic snake skull	<i>Rhoda DP, Segall M, Polly PD, Raxworthy C; University of Chicago, American Museum of Natural History, Indiana University</i>
52-12	Automated landmarking captures complex shapes in armored catfish jaws	<i>Black CR, Armbruster JW; Auburn University</i>
52-13	Charisma: An R tool to automatically determine discrete color classes for high-throughput color pattern analysis	<i>Schwartz ST, Tsai WLE, Karan EA, Alfaro ME; University of California Los Angeles</i>

Session 53

Evolutionary Physiology

Chair: Anusha Shankar

53-1	How do birds assess their own body mass? Testing how rapidly birds can respond to experimentally increased mass	<i>Hodinka BL, Williams TD; Simon Fraser University</i>
53-2	Variation in developmental trajectories associated with facultative pre-fledging mass recession in a common songbird	<i>Allen JM, Hodinka BL, Leonard KM, Williams TD; Simon Fraser University</i>
53-3	The genomic basis of local thermal adaptation in a montane insect	<i>Smeds EA, Dahlhoff EP, Rank NE; Sonoma State University, Santa Clara University</i>
53-4	Energy budgets to explain allometry: lessons from flying ninja hummingbirds	<i>Shankar A, Dávalos LM, Powers DR, Graham CH; Cornell University, Stony Brook University, George Fox University, Swiss Federal Institute WSL Birmensdorf Switzerland</i>
53-5	Revisiting the question of nucleated versus enucleated erythrocytes: A bird mammal comparison	<i>Yap KN, Zhang Y*; Auburn University, University of Memphis</i>
53-6	Divergent selection for basal metabolic rate in laboratory mice affected organ size rather than mitochondrial activity	<i>Brzęk P, Roussel D, Konarzewski M; University of Białystok, University of Lyon, France</i>
53-7	Metabolic recovery from exertion depends on the form of perturbation in lizards	<i>Leibold DC, Valencia V, Gangloff EJ, Telemeco RS; California State University - Fresno, Ohio Wesleyan University</i>
53-8	Salinity performance curves for escape responses in guppies shape distributional patterns of closely-related species along a salinity gradient	<i>Marshall CA, Zeller KR, Kane EA, Vincent J, Angeloni LM, Ghalambor CK; Colorado State University, University of Louisiana at Lafayette, Norwegian University of Science and Technology</i>
53-9	A test of altitude-related variation in aerobic metabolism of Andean birds	<i>Gutierrez-Pinto N, Londoño GA, Chappell MA, Storz JF; University of Nebraska-Lincoln, Universidad ICESI, University of California Riverside</i>
53-10	Conserved molecular responses to starvation in two Southern Ocean copepods	<i>Berger CA, Steinberg DK, Tarrant AM; Woods Hole Oceanographic Institution, MIT-WHOI Joint Program in Oceanography/Applied Ocean Science & Engineering, Virginia Institute of Marine Science</i>

Session 54

Fish Feeding I

Contributed Talks

Chair: Katrina Whitlow

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| <p>54-1 3D anatomical reconstruction of the feeding apparatus in Myxine using diceCT</p> <p>54-2 Come and spaghetti It: Morphology and feeding of the quillfish, <i>Ptilichthys goodei</i></p> <p>54-3 Turning liquid into vapor: Knifefish's powerful suction-feeding</p> <p>54-4 Feeding at the air-water interface: how prey position influences suction and ram in largemouth bass</p> <p>54-5 Cranial kinesis in actinopterygian suction feeding: mechanical correlates of prey motion in <i>Polypterus bichir</i></p> <p>54-6 Contributions of hypaxial and sternohyoid muscles to hyoid depression in bichirs</p> <p>54-8 A novel behavior upsets the adaptive peaks hypothesis in metamorphic frogs</p> | <p><i>Constantin ML, Farina SC, Gignac PM, Uyeno TA, Clark AJ; Howard University, Oklahoma State University, Valdosta State University, College of Charleston</i></p> <p><i>Pinion AK, Cohen KE, Donatelli CM, Kruppert S, Summers AP; Texas A&M University, Friday Harbor Labs, University of Washington, University of Ottawa</i></p> <p><i>Ortega-Jimenez VM, Sanford PC; Kennesaw State University</i></p> <p><i>Herbert AM, Higham TE; University of California Riverside</i></p> <p><i>Whitlow KR, Ross CF, Gidmark NJ, Westneat MW; University of Chicago, Knox College</i></p> <p><i>Rozen J, Rull M, Spence M, Konow N; University of Massachusetts Lowell</i></p> <p><i>Kinsey CT, Blob RW; Clemson University</i></p> |
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Session 55

Fish Feeding II

Chair: Todd Clardy

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| <p>55-1 The prementary bone and its role in feeding in billfishes</p> <p>55-2 Ontogeny of the feeding apparatus of the white croaker, <i>Genyonemus lineatus</i> (Sciaenidae)</p> <p>55-3 Agnathan-like heads of functionally jawless zebrafish</p> | <p><i>Habegger ML, Bright J; University of North Florida, University of Hull</i></p> <p><i>Clardy TR, Deary AL; Natural History Museum of Los Angeles County, Alaska Fisheries Science Center, NOAA</i></p> <p><i>Miyashita T, Baddam P, Smeeton J, Oel AP, Natarajan N, Gordon B, Palmer AR, Crump JG, Graf D, Allison WT; Canadian Museum of Nature, University of Alberta, Columbia University, European Molecular Biology Laboratory, University of Southern California</i></p> |
| <p>55-4 morphometrics and biomechanics of the three-dimensional four-bar linkage systems in wrasses (family: Labridae)</p> <p>55-5 Double-jointed biting of the serrasalmid sp. <i>Piaractus brachipomus</i></p> <p>55-6 The morphology of gills and the associated vessels of two larval amphibians, <i>Dicamptodon tenebrosus</i> and <i>Ascaphus truei</i>, and the lungfish <i>Lepidosiren paradoxa</i></p> <p>55-7 The Gizzard of Oz: mucus and motors and grit, oh my!: A comparative look at gizzards in fishes</p> <p>55-9 The fate of tooth replacement in Pacific Lingcod (<i>Ophiodon elongatus</i>) with pulse-chase experiments</p> | <p><i>Gartner SM, Evans K, Westneat MW; University of Chicago, Rice University</i></p> <p><i>Lomax JJ, Brainerd EL; Brown University</i></p> <p><i>Orr KP, Reiss JO; Humboldt State University</i></p> <p><i>Pos KM, Kolmann MA, Donatelli C, Cohen KE, Egan J, Hernandez LP; George Washington University, University of Michigan, University of Ottawa, University of Washington, Friday Harbor Laboratories, Western Michigan University</i></p> <p><i>Carr EM, Cohen KE, Summers AP; University of South Florida, Friday Harbor Labs, University of Washington</i></p> |

Session 56

Flight Dynamics & Mechanics

Chair: Yang Ding

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| <p>56-1 A high speed visual tracking system for analyzing in-flight insect interactions</p> <p>56-2 Force production and thoracic vibrations during defensive buzzing in carpenter bees (<i>Xylocopa: apidae</i>)</p> <p>56-3 Preliminary analysis of the aerodynamic responses of a red-tailed hawk traversing a vertical gust</p> <p>56-4 Evolutionary diversification of aerial control in the genus <i>Anolis</i></p> <p>56-5 Hummingbird load lifting performance not predicted by top speed in a wind tunnel</p> | <p><i>Ahmed I, Faruque IA; Oklahoma State University Stillwater</i></p> <p><i>Jankauski MA, Casey C, Busby K, Buchmann S; Montana State University, University of Arizona</i></p> <p><i>Swiney PA, Hedrick TL, Gosdin LR, Bellah JR, Hopkins AW, Raghav V; Auburn University, University of North Carolina at Chapel Hill</i></p> <p><i>Sathe EA, Dudley R; University of California, Berkeley</i></p> <p><i>Najar N, Fernandez L, Clark C; University of California Riverside, University of Aberdeen</i></p> |
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Contributed Talks

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| 56-6 | Escape maneuvers in calliope hummingbirds with visual feedback removed at varied timings | Anwar MZ, Agrawal S, Cheng B, Tobalske BW, Luo H; Penn State University, University of Montana, Missoula, MT |
| 56-7 | The influence of lateral and frontal optic flow on flight control in Anna's hummingbirds | Baliga VB, Dakin R, Altshuler DL; University of British Columbia, Carleton University |
| 56-8 | Functional modeling of hummingbird musculoskeletal system via optimization-based synthesis of wing skeletal model, motion kinematics and muscle forces | Agrawal S, Anwar Z, Song J, Hedrick T, Luo H, Tobalske B, Cheng B; Penn State, Royal Veterinary College, University of London, University of North Carolina at Chapel Hill, Vanderbilt University, University of Montana |
| 56-9 | Does load bearing constrain avian wing morphology? | Rader JA, Waldrop LD, Hedrick TL; UNC Chapel Hill, Chapman University |
| 56-10 | Aerodynamics and energetics of raptors: a comparative analysis between an owl and a hawk | Krishnan K, Gurka R*; Coastal Carolina University |
| 56-11 | Power requirements for flapping flight with heavy and highly articulated wings | Fan XZ, Swartz S, Breuer K; Brown University, Brown University |
| 56-12 | Evidence for a proximal-distal gradient in muscle responses to a wind gust perturbation in the Egyptian fruit bat | Rowley KM, Morris A, Bortoni A, Young I, Boerma D, Breuer K, Swartz SM; Brown University, American Museum of Natural History |

Session 57

Foraging Behavior and Predator/Prey

Chair:

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|--------------|--|---|
| 57-1 | Effects of acute temperature change on the feeding behaviors of <i>Gymnothorax mordax</i> | Moretto WI, Stahl AK, Mehta RS; University of California Santa Cruz |
| 57-2 | Use it or lose it: The impact of prolonged darkness and air exposure on the visual system of an amphibious fish | Rossi G, Labbé D, Wright P; University of Guelph |
| 57-3 | Brain size evolution precedes innovations in foraging strategy among woodpeckers | Cárdenas-Posada G, Iwaniuk AN, Fuxjager MJ; Brown University Providence, Wake Forest University, University of Lethbridge, Brown University |
| 57-4 | Butterflyfish effect: The relationship and influence of four-eye butterflyfish on corals infected with stony coral tissue loss disease | Noonan KR, Childress MJ; Clemson University |
| 57-6 | Mapping spatiotemporal changes of North American beaver (<i>L. Castor canadensis</i>) damming complexes | Kennedy J, Chen C, Mahadevan L, Nagpal R; Harvard University School of Engineering and Applied Sciences, Harvard College |
| 57-7 | Prey choices and behavior of water mite predators of mosquito larvae from nearshore habitats of the Laurentian Great Lakes | Vasquez A A, Walker X N, Ram J L, Miller C J; Wayne State University |
| 57-8 | Predator-avoidance response in larval black-bellied salamanders (<i>Desmognathus quadramaculatus</i>) to predator cues from native and nonnative salmonids | Dempsey BL, Bidwell JR; East Tennessee State University |
| 57-9 | Field experiments uncover variable anti-predator behaviors used by spotted lanternfly nymphs | Kane SA, Bien T*, Hsieh ST; Haverford College, Temple University |
| 57-10 | Effectiveness of <i>Cyprinodon bovinus</i> pupfish territorial defense against <i>Gambusia nobilis</i> egg predation: a tale of two endangered fishes | Snekser JL, Ashe TM, Itzkowitz M; Canisius College, LIU Post, Lehigh University |
| 57-11 | Attack of the killer copepod | Wagner G, Morgan N, Yen J; Georgia Tech |

Session 58

Foraging Behavior

Chair: Kathryn Feller

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| 58-1 | Mass variation pattern differences among temperate hibernating bats | Balzer EW, Grottoli A, Broders H; University of Waterloo |
| 58-2 | Follow the fracas: Global patterns of variation in disturbance foraging behavior of birds | Pollock HS, Hauber ME, Strejc B, Tarwater CE; UIUC, University of Wyoming |
| 58-3 | Prey size selection and visual acuity in toe-biters (<i>Belostomatidae</i>) | Feller KD, Mierow T, Gonzalez-Bellido PT; Union College, University of Minnesota |

Contributed Talks

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| 58-4 | Preference for colored nectar in <i>Phelsuma laticauda</i> | Chiari Y, Moreno N, Roy R, Kostanecki A, Brockman S, Holl C, Solhaug EM, Minami A, Hampton M, Bee M, Hegeman A, Carter C; George Mason University, University of Minnesota |
| 58-5 | The presence of others may shape the economic decision making of a food-storing arboreal squirrel | Robin AN, Nonacs P; University of California Los Angeles |
| 58-6 | Feeding preferences of <i>Pugettia gracilis</i> (Graceful Kelp Crab) | Johnson KH, Dobkowski KA; Bates College |
| 58-7 | Generational variation in nutrient regulation for an outbreaking herbivore | Le Gall M, Cease AJ; Arizona State University |
| 58-8 | Does learning style affect performance and plasticity in shoaling fish? | O'Reilly L, Dalesman S, Akanyeti O; Aberystwyth University |

Session 59

Global Change and Population Ecology

Chair: Emily Roberts

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| 59-1 | Direct sunlight reduces the cost of keeping altricial avian offspring warm | Mainwaring MC, Martin TE, Wolf BO, Tobalske BW; University of Montana, University of New Mexico |
| 59-2 | Noise as a potential mechanism underlying the effects of urbanization on the avian gut microbiome | Berlow M, Derryberry E, Wada H; University of Tennessee Knoxville, Auburn University |
| 59-3 | The effects of predicted activity time on population-level measures of productivity in squamates: a comparative analysis | Neel LK, Fornshell D, Angilletta MJ; Arizona State University |
| 59-4 | Potential of thermal tolerance plasticity as a coping mechanism with global warming in amphibians | Ruthsatz K, Dausmann KH, Peck MA, Glos J; Technical University of Braunschweig, University of Hamburg, Royal Netherlands Institute for Sea Research |
| 59-5 | Snow modulates winter energy use and cold stress across an elevation gradient in a montane ectotherm | Roberts KT, Rank NE, Dahlhoff EP, Stillman JH, Williams CM; University of California Berkeley, Sonoma State University, Santa Clara University |
| 59-6 | Consequences of pre-winter temperatures for diapausing pupae | Nielsen ME, Lehmann P, Gotthard K; Stockholm University |
| 59-7 | Heritability of critical thermal maximum temperature in <i>Fundulus heteroclitus</i> | Carrasquillo AL, Crawford DL, Oleksiak MF; University of Miami |
| 59-8 | Assessing environmental tolerance of <i>Mercenaria mercenaria</i> along the east coast of the United States | Himes AR, Rivest EB, McDowell JR, Reece KS, Snyder RA; Virginia Institute of Marine Science, William & Mary |
| 59-9 | Simulated ocean and aerial warming have opposing effects on the growth of the barnacle, <i>B. glandula</i> : An energy budget model approach | Roberts EA, Gilman SE; Claremont McKenna College, Scripps College |
| 59-10 | Effects of rising temperatures on physiological functions, protein expression, and cell death in an Echinoid species | Johnstone JB, Rahman MS; Texas A & M, University of Texas Rio Grande Valley |

Session 60

Gut Microbiomes

Chair: Tosha Kelly

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| 60-1 | Reduction of the adult gut microbiome decreases wheel-running behavior in mice selectively bred for high voluntary wheel running | McNamara MP, Cadney MD, Castro AA, Hillis DA, Kallini KM, Macbeth JC, Schmill MP, Schwartz NL, Hsiao A, Garland T; Univ of California, Riverside |
| 60-2 | Effects of early-life exposure to adult feces and natural substrate on the survival, phenotype, and gut microbiome of Western Fence Lizards | Underhill D, Putnam N, Valencia V, Van Laar TA, Telemeco RS; California State University Fresno, University of California Davis |
| 60-3 | No guts about it: captivity, but not neophobia phenotype, affects cloacal microbiome of house sparrows | Kelly TR, Vinson AV, Lattin CR; Louisiana State University |
| 60-4 | How the interaction between host and gut microbiota promotes threespine stickleback's adaptation to distinct trophic niches | Härer A, Rudman SM, Rennison DJ; University of California, Washington State University |
| 60-5 | Defining the origin of the prenatal gut microbiome in the house mouse | Gardner SA, Campbell P; University of California Riverside |

Contributed Talks

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| 60-6 | Contribution of the gut microbiome to toxin tolerance in mushroom feeding <i>Drosophila</i> | Giambrone SA, Beveridge J, Haynes L, Fish O, Lose B, Reed L, Scott Chialvo C; University of Alabama, Appalachian State University |
| 60-7 | Live yeasts accelerate <i>Drosophila melanogaster</i> larval development | Jiménez-Padilla Y, Lachance M-A, Sinclair BJ; Western University |
| 60-8 | Unraveling the predictive role of temperature in the gut microbiome of an abundant marine invertebrate | Ketchum RN, Smith EG, Vaughan GO, McParland D, Al-Mansoori N, Burt JA, Reitzel AM; University of North Carolina at Charlotte, NYUAD |

Session 62

Hosts, parasites & pathogens: ecology and evolution

Chair: Dana Hawley

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| 62-1 | Does female songbird odor vary by blood parasite identity or parasite load? | Talbot KT, Soini HO, Novotny MV, Ketterson ED; Indiana University, Indiana University |
| 62-2 | Simulating disease risk for juvenile salmonids using a mechanistic framework to model the spring density of the parasite <i>Ceratomyxa shasta</i> | Robinson HE, Alexander JD, Bartholomew JL, Hallett SL, Hetrick NJ, Perry RW, Som NA; Humboldt State University, Oregon State University, US Fish and Wildlife Service, US Geological Survey, Humboldt State University |
| 62-3 | When you eat matters: The effects of feeding frequency on tadpole growth and susceptibility to enemies | Verdi R, Tredo S, Hua J; Binghamton University |
| 62-4 | Replicated evolution in the threespine stickleback (<i>Gasterosteus aculeatus</i>) – <i>Schistocephalus solidus</i> host-parasite System | Wohlleben AM, Steinel N, Baker JA, Foster SA; Clark University, UMass Lowell |
| 62-5 | Resistance to ectoparasitic mites yields metabolic trade-offs in fruit flies | Benoit JB, Bose J, Talbot H, Lewis DA, Polak M; University of Cincinnati |
| 62-6 | Thermal mismatch in an insect host-parasitoid-endosymbiont system: causes and consequences | Malinski KH, Kingsolver JG, Willett CS; University of North Carolina, Chapel Hill |
| 62-7 | Investigating the disease ecology of Ranaviruses (Family Iridoviridae) in ectothermic vertebrates of southern China | Herath JCB, Meegaskumbura M; Guangxi University |
| 62-8 | Host phylogeny matters: Examining sources of variation in infection risk by blood parasites across a tropical montane bird community in India | Gupta P, Vishnudas CK, Robin VV, Dharmarajan G; University of Georgia, Indian Institute of Science Education and Research Tirupati |
| 62-10 | Chytrid fungi transcriptomic signatures indicate different infection strategies in newts | Torres-Sánchez M, McGrath-Blaser S, Villate J, Longo AV; University of Florida |
| 62-12 | Molecular identification of juvenile <i>Neoechinorhynchus</i> spp. (phylum: Acanthocephala) infecting ostracod and snail hosts provides insight into acanthocephalan host use | Koch RW, Shannon RP, Detwiler JT, Bolek MG; Oklahoma State University, University of Manitoba |
| 62-13 | Examining skin microbiome of Trinidadian guppy and ectoparasite infection dynamics | Kramp R, Rudzki E, Kohl K, Stephenson J; University of Pittsburgh |
| 62-14 | Diversity and prevalence of trematode parasites in the common periwinkle on the coast of Massachusetts | Ershova NA; University of Chicago |

Session 63

Immune-based Trade-offs

Chair: Eve Robinson

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| 63-1 | Immunological response to leg autotomy in the wolf spider <i>Tigrosa helluo</i> | Valentini AL, Garcia M, Vargas R, Steffenson M; St. Edward's University |
| 63-2 | To what extent do life history characteristics and other ecological traits predict avian immune defences? A systematic review | Peng WX, de Cuba AG, de Boer WF, Matson KD; Wageningen University |
| 63-3 | Context-based costs of innate immunity? Trade-offs between reproductive effort and bactericidal capacity vary with timing of breeding in a migratory bird | Chang van Oordt DA, Taff CC, Ryan TA, Vitousek MN; Cornell University |
| 63-4 | The effect of colony relocation on Italian honeybee immunological response | Ranchod PN, Weier D, Steffenson M; St. Edward's University |

Contributed Talks

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| 63-5 | Refining assay recipes to measure immunological responses | <i>Garcia M, Fotinos E, Steffenson M; St. Edward's University</i> |
| 63-6 | Evaluation of the trade-off between molt and innate immunity in the domestic chicken (<i>Gallus gallus domesticus</i>) | <i>DeRogatis AM, Klasing KC; University of California Davis</i> |
| 63-7 | Effects of simulated climate warming on the development of immune defenses in juvenile leopard frogs | <i>Saenz V, Rollins-Smith L, Hall EM, Reinert L, Ohmer ME, Richards-Zawacki C; University of Pittsburgh, Vanderbilt University</i> |
| 63-8 | Immunological and health correlates of avian malaria infection and resilience in the Hawaii Amakihi (<i>Hemignathus virens</i>) | <i>Names G, Schultz E, Klasing K; University of California Davis, Wittenberg University</i> |
| 63-9 | Sex-based trade-offs in the innate and acquired immune systems of <i>Sternotherus minor</i> | <i>Lopez-Perez JE, Goessling JM, Meylan PA; Southeastern Louisiana University, Eckerd College</i> |
| 63-10 | Mating enhances immune function of <i>Drosophila melanogaster</i> populations against bacterial pathogens | <i>Bansal N, Sit B, Singh A, Hegde T, Dutta R, Prasad NG; University of Nebraska-Lincoln, IISER Mohali</i> |

Session 64

Immunity

Chair: Vania Regina de Assis

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|-------------|--|---|
| 64-1 | Differential gene expression among house finch populations that differ in tolerance to <i>Mycoplasma gallisepticum</i> | <i>Henschen AE, Dalloul RA, Hawley DM, Adelman JS; University of Memphis, Virginia Tech, University of Georgia</i> |
| 64-2 | Immune gene expression covaries with gut microbiome composition in stickleback | <i>Fuess LE, den Haan S, Ling F, Weber J, Steinel NC, Bolnick DI; Texas State University, Central European University, Northwest A&F University, University of Wisconsin-Madison, University of Massachusetts Lowell, University of Connecticut</i> |
| 64-3 | The expansion and loss of pattern recognition receptors across the phylum Cnidaria | <i>Emery M, Dimos B, Mydlarz L; University of Texas at Arlington</i> |
| 64-4 | Body size shapes immune cell proportions in birds and non-volant mammals, but not bats | <i>Cornelius Ruhs E, Becker DJ, Oakey SJ, Droke HF, Ogunsina O, Fenton MB, Simmons NB, Martin LB, Downs CJ; University of South Florida, Indiana University, Western University, American Museum of Natural History, SUNY College of Environmental Science and Forestry</i> |
| 64-5 | Heterospecific competitors and seasonality can affect host physiology and behavior, key determinants of disease transmission | <i>Eleftheriou A, Kuenzi AJ, Luis AD; University of Montana Missoula, Montana Tech of the University of Montana</i> |
| 64-6 | Maternal disease history shapes how offspring respond to infection | <i>Love AC, Kodali J, Grisham K, DuRant SE; University of Arkansas, Oklahoma State University</i> |
| 64-7 | Ectoparasites impact on stress and immune response in Florida invasive cane toads (<i>Rhinella marina</i>) | <i>Assis VR, Tilton Jr B, Gomes FR, Ward CK, Mendonça MT; University of Sao Paulo, Auburn University</i> |
| 64-8 | Relationships between thermal preference, parasites, and antibodies in the red-eared slider turtle | <i>Smail SJ, Stuart V, Zimmerman LM*; Millikin University</i> |
| 64-9 | Protective effects of intact ocular microbiomes in house finches are unrepeatable and not dependent on pathogen dose | <i>Weitzman CL, Rostama B, Belden L, May M, Hawley DM; Virginia Tech, University of New England</i> |

Session 65

Impact of Climate Change on Physiology

Chair: Helen Chmura

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|-------------|---|---|
| 65-1 | Ontogenetic behavior of a tropical shark under future ocean acidification scenarios | <i>Villanueva I, Di Santo V; Stockholm University</i> |
| 65-2 | Sub-lethal effects from global environmental stressors on the physiology of <i>Crassostrea virginica</i> during the larval stage and settlement process | <i>Schatz A, McDowell J, Rivest EB; Virginia Institute of Marine Science, William & Mary</i> |
| 65-3 | Temperature preference and aerobic scope in <i>Zebrasoma flavescens</i> and the response to rising sea temperatures | <i>van Hall ES, Korsmeyer KE; Hawaii Pacific University</i> |
| 65-4 | Different drivers, common mechanism: The distribution of a reef fish is restricted by local scale oxygen and temperature limits on aerobic metabolism | <i>Duncan MI, James NC, Potts WM, Bates AE; Stanford University, South African Institute for Aquatic Biodiversity, Rhodes University, Memorial University</i> |

Contributed Talks

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| <p>65-5 Population-specific variability in the thermal performance of Fraser River Chinook salmon</p> <p>65-6 Incubation temperature and maternal effects on thermal physiology in <i>Ambystoma mexicanum</i></p> <p>65-7 Does body size correspond to environmental temperature in reptiles over geologic time scales?</p> <p>65-8 Assessing the functional consequences of climate change: tissue-specific responses to heat in a wild bird</p> <p>65-9 Soil freeze date and onset of sub-zero heterothermy in hibernating arctic ground squirrels track climate change in Arctic Alaska</p> <p>65-10 Timing and severity of stressful temperature exposures influence egg development and hatching success in multiple Ixodid ticks</p> <p>65-11 Sensitivity of thermal tolerance to precipitation and humidity in a high-latitude click beetle</p> <p>65-12 Widow Wars: Testing the Mechanisms Underlying Invasion Success of a Globally Invasive Spider</p> | <p><i>Van Wert JC, Hendriks BJ, Ekström A, Patterson DA, Cooke SJ, Hinch SG, Eliason EJ; University of California Santa Barbara, University of British Columbia, University of Gothenburg, Simon Fraser University, Carleton University</i></p> <p><i>Spranger RR, Sinervo BR; University of California Santa Cruz</i></p> <p><i>ElShafie SJ; University of California Berkeley</i></p> <p><i>Woodruff MJ, Rosvall KA; Indiana University Bloomington</i></p> <p><i>Chmura HE, Burrell G, Buck CL, Barnes BM, Williams CT; University of Alaska Fairbanks, Northern Arizona University</i></p> <p><i>Ajayi OM, Oyen KJ, Benoit JB; University of Cincinnati</i></p> <p><i>Riddell EA, Mutanen M, Ghalambor CK; Iowa State University, University of Oulu, Colorado State University</i></p> <p><i>Aragon Traverso JH, Melian AD, Sanabria EA, Quiroga LB, Espinoza RE; Instituto de Ciencias Básicas, Facultad de Filosofía Humanidades y Artes, Universidad Nacional de San Juan, California State University, Universidad Nacional de Cuyo, Consejo Nacional de Investigaciones Científicas y Técnicas</i></p> |
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Session 66

Insect Wing Structure-Function

Chair: Nick Burnett

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| <p>66-1 Shooting the gap: how bees protect their wings in windy, dynamic obstacle courses</p> <p>66-2 Dimensional analysis reveals limits on peak efficiency of flapping wing flight due to structural damping</p> <p>66-3 Numerical simulation of high-fidelity dragonfly wings for "Fly-by-Feel"</p> <p>66-4 Reconstructing full-field flapping wing dynamics from sparse measurements</p> <p>66-5 The evolution of wing shape and movement in bombycoid moths reveals two distinct strategies for agile flight</p> <p>66-6 Influence of flexural rigidity on force production in flapping wings</p> <p>66-7 Finite element analyses of flapping wings meets inertial sensing</p> <p>66-8 Whole-wing microtomographic imaging of grasshopper wings</p> <p>66-9 A model for multi-agent group motion inspired by insect visuomotor feedback</p> <p>66-10 Sticky flapper: three-dimensional flapping flight with bristled wings</p> <p>66-11 Acceleration-reaction forces in high-frequency flapping insect wings, a systematic numerical study</p> <p>66-12 Wing flexibility of cicadas during takeoff: A pandemic story</p> | <p><i>Burnett NP, Badger MA, Combes M; University of California Davis</i></p> <p><i>Lynch J, Gau J, Sponberg S, Gravish N; University of California San Diego, Georgia Institute of Technology</i></p> <p><i>Maeda M, Walker SM, Fabian JM, Siwanowicz I, Lin HT, Bomphrey RJ; Royal Veterinary College, University of Leeds, Flinders University, HHMI Janelia Research Campus, Imperial College London</i></p> <p><i>Johns W, Davis L, Jankauski M; Montana State University</i></p> <p><i>Aiello BR, Sikandar UB, Minoguchi H, Kimball KC, Hamilton CA, Kawahara AY, Sponberg S; Georgia Institute of Technology, University of Idaho, Florida Museum of Natural History</i></p> <p><i>Reade JE, Schwab RK, Jankauski MA; Montana State University</i></p> <p><i>Mamo AH, Weber AI, Mohren TL, Babaei M, Daniel TL; University of Washington, Carnegie Mellon University</i></p> <p><i>Salcedo MK, Shevchenko PD, Socha JJ; Virginia Tech, Argonne National Laboratory</i></p> <p><i>Billah MA, Faruque IA; Oklahoma State University</i></p> <p><i>Kasaju VT, Santhanakrishnan A; Oklahoma State University</i></p> <p><i>van Veen WG, van Leeuwen JL, Muijres FT*; Wageningen University & Research</i></p> <p><i>Socha JJ, Pulliam JN, Salcedo MK, Hernandez AM, Jackson BE; Virginia Tech, Harvard University, Longwood University</i></p> |
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Session 67

Larval Ecology

Contributed Talks

Chair: Jonathan Allen

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| <p>67-1 A hierarchy of sensory cues control larval settlement in the actinula larvae of <i>Ectopleura crocea</i> (Hydrozoa)</p> <p>67-2 Larval stage, temperature, and phytoplankton patches affect sea star (<i>Pisaster ochraceus</i>) swimming behavior</p> <p>67-3 Larval cloning in brittlestars</p> <p>67-4 Plasticity in egg size of the tropical marine polychaete <i>Hydroides elegans</i></p> <p>67-5 Will carpenter bee (<i>Xylocopa californica</i>) nest temperatures exceed larval CT_{max}?</p> <p>67-8 Maternal environment drives larval rockfish gene expression patterns</p> | <p><i>Birch S, Plachetzki D; University of New Hampshire, Durham</i></p> <p><i>Leveque-Eichhorn L, Grunbaum D, George SB; University California Berkeley, Georgia Southern University</i></p> <p><i>Allen JD; William and Mary</i></p> <p><i>Genovese CB, Moran AM, Jewell M, Marko P; University of Hawaii at Manoa</i></p> <p><i>Busby MK, Davidowitz G, Bronstein JL; University of Arizona</i></p> <p><i>Baker JB, Saksa KV, Kashef NS, Stafford DM, Sogard SM, Hamilton SL, Logan CA; Moss Landing Marine Laboratories, CSU Monterey Bay, Marine Science Institute UCSC, NMFS South West Fisheries Science Center</i></p> |
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Session 68

Life History and Mating Systems

Chair: David Delaney

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| <p>68-2 “Males” that look “male” and “females” that look like “hermaphrodites”: Evolution of sexual systems in Australian nightshades</p> <p>68-3 Fecundity and self-compatibility variation among lineages and across ontogeny in a self-fertilizing fish</p> <p>68-4 Age predicts risky investment better than residual reproductive value in a long-lived vertebrate</p> <p>68-5 Maternal effects throughout development in fishes inhabiting extreme environments</p> <p>68-6 Resource acquisition, allocation, and energy production change in tandem through development to support flight or reproduction in wing-dimorphic crickets</p> <p>68-8 Mate choice vs mate preference: Color-assortative mating pattern in a polymorphic poison frog</p> <p>68-9 Powering a punch: Male-biased sexual dimorphism in human fist-propelling performance</p> <p>68-10 Rapid evolution of sperm midpiece size across the animal tree of life</p> <p>68-11 Beyond the binary: sexual variation in threespine stickleback (<i>Gasterosteus aculeatus</i> L.)</p> <p>68-12 Pseudogenized amelogenin reveals early tooth loss in the evolution of true toads</p> | <p><i>Martine CT, McDonnell AJ; Bucknell University, Chicago Botanic Garden</i></p> <p><i>Gresham JD, Earley RL; Emory University, University of Alabama</i></p> <p><i>Delaney DM, Hoekstra LA, Janzen FJ; University of Colorado Boulder, Oklahoma State University, Kellogg Biological Station</i></p> <p><i>Coffin JL, Onnen J, Tobler M; Kansas State University</i></p> <p><i>Treidel LA, Williams CM; UC Berkeley</i></p> <p><i>Yang Y, Richards-Zawacki CL; Washington University, University of Pittsburgh</i></p> <p><i>Morris JS, Link J, Martin JC, Carrier DR; Wofford College, University of Utah</i></p> <p><i>Kahl AF; Stockholm University</i></p> <p><i>Schutz H, Jamniczky HA, Anderson RJ, Warwick EG, Barry TN; Pacific Lutheran University, University of Calgary, University of Notre Dame, University of Lethbridge</i></p> <p><i>Abramyan J, Shaheen J; University of Michigan - Dearborn</i></p> |
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Session 69

Life in Moving Fluids I

Chair: Kakani Katija

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| <p>69-1 Sense-induced flow: Challenging Vogel's current induced flow hypothesis with in situ experiments on a deep glass sponge reef</p> <p>69-2 Soft corals vibrating under flow to improve food capture?</p> <p>69-4 The effects of external flow on the feeding currents of sessile microorganisms</p> | <p><i>Matveev E, Kahn AS, Aragonés Suarez P, Guillas KC, Yahel G, Leys SP*; University of Alberta, Moss Landing Marine Labs, San Jose State University, Rupp Academic Institute</i></p> <p><i>Boudina M, Gosselin FP*, Etienne S; Polytechnique Montreal</i></p> <p><i>Pepper RE, Riley EE, Baron M, Hurot T, Tor Nielsen L, Koehl MAR, Kjørboe T, Andersen A; University of Puget Sound, Technical University of Denmark, Ecole Normale Supérieure Paris-Saclay, Ecole Polytechnique, University of California Berkeley</i></p> |
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Contributed Talks

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| 69-5 | The effect of wavelength in seal whisker undulations | Lyons KM, Heck K, Fercak O, Haddock WA, Cal RB, Martin WN, Murphy CT, Franck JA; University of Wisconsin-Madison, Portland State University, Brown University, US Navy |
| 69-6 | Swimming of the mosquito larva: principles and tricks of locomotion at intermediate Reynolds numbers | Jin B, Luo H, Ding Y*; Beijing Computational Science Research Center, Vanderbilt University |
| 69-7 | ViscoSens: The role of multiple sensory modalities in steady swimming | Hainer JC, Maki H, Lutek K, Znotinas KR, Standen EM; University of Ottawa |
| 69-8 | EyeRIS (Remote Imaging System): A novel, in situ lightfield imaging system that enables time-resolved three-dimensional visualizations of particles and animals in the deep sea | Katija K, Roberts PLD, Daniels J, Henthorn R, Klimov D, Ruhl H, Sherman AD; Monterey Bay Aquarium Research Institute |

Session 70

Life in Moving Fluids II

Chair: Karakas

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| 70-1 | How kelp in drag lose their ruffles: Environmental cues, growth kinematics, and mechanical constraints | Koehl MAR, Silk WK; University of California Berkeley, University of California Davis |
| 70-2 | Shell shape and size defines the swimming and sinking characteristics of pelagic snails | Karakas F, Maas AE, Murphy DW; University of South Florida, Bermuda Institute of Ocean Sciences |
| 70-3 | Why so many fins? A first look at how Polypterus senegalus use their finlets | Wolf Z, Lauder GV; Harvard University |
| 70-4 | Fish locomotion: reconstructing fish midline kinematics from multiple inertial measurement units | White CF, Lauder GV; Harvard University |
| 70-6 | Control surface-body size relationships in baleen whale species | Adams DA, Bierlich KC, Dale J, Johnston DW, Goldbogen JA, Friedlaender AS, Segre P, Blob RW, Price SA; Clemson University, Duke University, Stanford University, University of California Santa Cruz |
| 70-7 | Minimum drag on a three-dimensional North Atlantic right whale model via neutral trim pose | Wu C, Howle LE, Nowacek DP; Duke University |
| 70-8 | Impact force of high diving of animals (dolphins, penguins, frogs) and humans | Pandey A, Yuk J, Chang B, Fish FE, Jung S*; Cornell University, Clark University, West Chester University |
| 70-9 | Estimating whole-body kinematics of swimming bottlenose dolphins | Antoniak G, Xargay E, Barton K, Popa B-I, Shorter KA; University of Michigan Ann Arbor, CSTAR Pte Ltd Singapore |
| 70-10 | A data driven approach for estimating hydrodynamic drag of bottlenose dolphins | Zhang D, Wang Y, Lauderdale LK, Gabaldon J, Miller LJ, Barton K, Shorter KA; University of Michigan, Chicago Zoological Society |

Session 71

Limb Biomechanics

Chair: Andrew George

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| 71-1 | Strategies of single arm foraging in Octopus rubescens in the absence of visual feedback | Sivillini DM, Weertman WL, Busch EL, Ullmann JF, Smith JR, Gire DH; University of Washington, Alaska Pacific University, Yale University |
| 71-2 | Hindlimb skeletal anatomy and kinematics vary with swimming behavior in ducks | Taylor-Burt KR, Biewener AA; Franklin & Marshall, Harvard U |
| 71-3 | Intermetatarsal mobility in the American alligator | Turner ML, Gatesy SM; Brown University |
| 71-4 | Three-dimensional kinematic analyses reveal asymmetries in Xanthichthys auromarginatus (Balistidae) median fin biomechanics during steady balistiform swimming | George AB, Westneat MW; Field Museum of Natural History, University of Chicago |
| 71-5 | Flipping frogfish fins: Using XROMM to study frogfish pectoral fins during locomotion | Amplio HE, Flammang BE, Camp C; Rutgers University-Newark, NJIT, University of Liverpool |
| 71-6 | Effects of tendon-network mechanisms on avian terrestrial locomotion | Bribiesca-Contreras F, Daley MA, Badri-Spröwitz A; Max Planck Institute for Intelligent Systems, University of California Irvine |
| 71-7 | Investigating chukar ontogeny can shed light on flight evolution and form-function relationships | Klein SM, Chase HT, Tobalske BW; University of Montana Missoula |
| 71-8 | Determinants of maximum wrist extension in humans and chimpanzees | Rainbow MJ, Mack ZM, Lee ECS, Orr CM; Queen's University, University of Colorado |

Contributed Talks

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| 71-9 | The impact of cranial-lateral scapular shape variations on glenohumeral ligaments | Li EY, Lee ECS, Young NM, Rainbow MJ; Brown University, Queen's University, University of California San Francisco |
| 71-10 | Sprawling locomotion aspects in a therian mammal? 3-Dimensional forelimb kinematics of Tamandua | Scheidt A, Geiger SM, Wagner FC, Mülling CKW, Nyakatura JA; Humboldt University of Berlin, University of Leipzig |
| 71-11 | 3D glenohumeral range-of-motion in living and fossil primates, predicted in silico from skeletal morphology | Lee ECS, Young NM, Rainbow MJ; Queen's University, University of California San Francisco |

Session 72

Locomotion: Body Stiffness & Posture

Chair: Robert Cieri

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| 72-1 | Ground reaction forces in monitor lizards (Varanidae) and the scaling of locomotion in sprawling tetrapods | Cieri RL, Dick TJM, Clemente CJ; University of the Sunshine Coast |
| 72-2 | Free swimming kinematics and whole-body mechanics of the Atlantic mackerel, <i>Scomber scombrus</i> | Pfeiffenberger JA, Anderson EJ, Tytell ED; Tufts University, Grove City College |
| 72-3 | Can one control strategy unite all carangiform swimmers? | Akanyeti O, Fetherstonhaugh S; Aberystwyth University |
| 72-4 | Vertical locomotion and associated manual and pedal postures in arboreal mammals | Toussaint SLD, Youlatos D, Nyakatura JA; Humboldt University of Berlin, Aristotle University of Thessaloniki |
| 72-5 | Stepping up: Musculoskeletal modelling of sprawling and erect forelimbs | Brocklehurst RJ, Fahn-Lai P, Regnault S, Pierce SE; Harvard University, University of Surrey |
| 72-6 | Biomechanical modelling of musculoskeletal leverage gives insight into locomotion of Nile crocodiles | Wiseman ALA, Bishop PJ, Demuth OE, Cuff AR, Michel KB, Hutchinson JR*; Royal Veterinary College |
| 72-7 | Ex vivo 3D measurements of shoulder mobility and muscle moment arms in sprawling and upright amniotes | Fahn-Lai P, Regnault S, Biewener AA, Pierce SE; Harvard University, Harvard University and University of Surrey |
| 72-8 | Ontogenetic changes in limb kinematics, forces, and joint moments in American alligators | Iijima M, Munteanu VD, Kinsey CT, Elsey RM, Blob RW; Clemson University, Louisiana Department of Wildlife and Fisheries |
| 72-9 | Modeling internal forces in limbless organisms during locomotion | Van Stratum B, Clark J, Shoele K; Florida State University |
| 72-10 | Constraining quadrupedal launch: Range of motion in <i>Coloborhynchus robustus</i> | Griffin B, Martin-Silverstone E, Demuth O, Palmer C, Rayfield EJ; University of Bristol |
| 72-11 | Compromise between limb work and joint work minimization accounts for elbows-back, knees-forward arrangement in quadrupeds, and the 3-segment Z-leg configuration | Usherwood JR, Granatosky MC, McGowan CP; Royal Veterinary College, New York Institute of Technology, University of Idaho |
| 72-12 | Primate nuchal anatomy and function | McGechie F, Grider-Potter N, Nalley TK, Fricano E, Middleton KM, Holliday CM, Ward CV; University of Missouri, Rocky Vista University, Western University of Health Sciences |

Session 73

Locomotion: Challenges & Obstacles

Chair: Chen Li

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| 73-1 | Effects of leg loss depend on the leg lost in cockroaches | Saintsing AJ, Full RJ; University of California Berkeley |
| 73-2 | Simultaneous wing opening and leg flailing enables strenuous ground self-righting in cockroaches | Othayoth R, Li C*; Johns Hopkins University |
| 73-3 | Large spatiotemporal scale measurement of cockroach traversal of large obstacles | Othayoth R, Francois E, Li C; Johns Hopkins University |
| 73-4 | Scaling of burrowing resistances with sediment depth: a geomechanical perspective | Chen Y, DeJong JT, Jaeger RA, Martinez A*; University of California Davis, California Department of Water Resources |
| 73-5 | Body-leg coordination in lizard locomotion along the body elongation and limb reduction continuum | Zhong B, Goldman D, Bergmann P; Georgia Tech, Clark University |
| 73-6 | Effect of motivation on sequential jump strategy in fox squirrels | Wang LK, Ruopp R, Hunt N, Nguyen A, Full RJ; University of California Berkeley, University of Nebraska Omaha |
| 73-7 | Turning in treacherous terrain: Slip and fall risk and locomotion priority in guinea fowl | Whitacre TD, Goldsmith HL, Hubicki CM, Daley MA; University of California Irvine, Royal Veterinary College, Florida State University |

Contributed Talks

73-8	Frequent encounters of the compliant kind: the cursorial Namib day gecko maintains speed and alters posture during substrate transitions	<i>Naylor ER, Higham TE; University of California Riverside</i>
73-9	The role of basilisk lizard toe fringes in effective water running	<i>Bagheri H, Huang Z, Lentink D, Marvi H; Arizona State University, Stanford University</i>
73-10	Discovering simple mechanical models from motion data: A novel representation shown in ground righting geckos	<i>McInroe BW, Baryshnikov YM, Koditschek DE, Full RJ; University of California, University of Illinois, University of Pennsylvania</i>
73-11	Kinematics of running across hard and granular surfaces in specialist and generalist lizards	<i>Tucker EL, Mantilla DC, Hsieh ST; Temple University</i>
73-12	Enhancing legged robot navigation of rough terrain via use of a tail	<i>Soto D, Goldman DI; Georgia Institute of Technology</i>
73-13	Legged locomotion at low Reynolds numbers: limitations on insects and microrobots	<i>St. Pierre R, Bergbreiter S; University at Buffalo, Carnegie Mellon University</i>

Session 74

Locomotion: Climbing & Complex Terrain

Chair: Hosain Bagheri

74-1	Juvenile pandas use head motion to maintain balance during climbing	<i>Zhao W, Ayala J, Schulz A, Rong H, McGowan C, Hu D; Georgia Tech, Chengdu Research Base of Giant Panda Breeding, University of Idaho</i>
74-2	Acrobatic archosaurs: kinematic comparisons of climbing behaviors in turtles and alligators	<i>Greenslit NW, Erskine OM*, Iijima M, Blob RW, Palecek AM; Clemson University</i>
74-3	Climbing strategies of cicadas across vertical 'gaps' of low friction	<i>Pulliam JN, Salcedo MK, Weiss TM, Hernandez AM, Socha JJ; Virginia Tech, Harvard University</i>
74-4	A small squirrel (<i>Tamias swinhoei</i>) sheds light on the complex biomechanical adaptations to fast arboreal locomotion	<i>Wölfer J, Michel J, Aschenbach T, Nyakatura JA; Humboldt-Universität zu Berlin</i>
74-5	Body size influences transition to dynamic gap crossing movements in Australian tree snakes	<i>Graham M, Clemente CJ, Socha JJ; Virginia Tech, University of the Sunshine Coast</i>
74-6	Centipede locomotion on bumpy terrain	<i>Erickson E, Diaz K, Carruthers A, Ozkan-Aydin Y, Chong B, Goldman DI; Georgia Tech</i>
74-7	Snakes traversing complex 3-D terrain	<i>Fu Q, Astley HC, Li C; Johns Hopkins University, University of Akron</i>
74-8	<i>C. elegans</i> maneuvering strategies in heterogeneous environments	<i>Diaz K, Chong B, Ding JL, Lu H, Goldman DI; Georgia Tech</i>
74-9	Tiger salamanders (<i>Ambystoma tigrinum</i>) increase foot contact surface area on challenging substrates during terrestrial locomotion	<i>Vega CM, Ashley-Ross MA; Wake Forest University</i>
74-10	Stochastic dynamics model statistically predicts beam obstacle traversal	<i>Zheng B, Xuan Q, Li C; Johns Hopkins University</i>
74-11	An energy landscape based dynamic model to simulate locomotion in complex 3-D terrain	<i>Xuan Q, Li C; Johns Hopkins University</i>

Session 75

Locomotion: Gaits & Gait Changes

Chair: SLD Toussaint

75-1	The water to land transition, submerged: How octopuses and other animals integrate movement on substrate and in water to locomote in aquatic environments	<i>Hale ME, Paletta MG; University of Chicago</i>
75-3	Biomechanical energetics of terrestrial locomotion: California sea lion vs. northern elephant seal	<i>Kerr SJ, Nicastro AJ, Zeligs J, Skrovan S, Fish FE; West Chester University, Moss Landing Marine Labs</i>
75-4	Fin motion patterns in swimming stingrays	<i>Tumminelli AN, Bartol IK; Old Dominion University</i>
75-5	Muscle power production during intermittent swimming in bluegill	<i>Coughlin DJ, Santarcangelo K, Wilcock EB, Ellerby DJ; Widener University, Wellesley College</i>
75-6	Locomotor spectra in basal vertebrates	<i>Struble MK, Gibb AC; Northern Arizona University</i>

Contributed Talks

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|------|---|---|
| 75-7 | Dynamic optimization estimation of maximum running speed capacity in bipedal archosaurs | Bishop PJ, Falisse A, De Groote F, Hutchinson JR; Royal Veterinary College, KU Leuven |
| 75-8 | A reduced 'pelvic step' partially explains short stride length during human bipedalism | Thompson NE, Rubinstein D, Parrella-O'Donnell W, Brett M, Demes B, Larson SG, O'Neill MC; NYIT College of Osteopathic Medicine, Lancaster General Hospital, Stony Brook University, Midwestern University |
| 75-9 | Swing it like a piglet | Mielke F, Van Wassenbergh S, Van Ginneken C, Aerts P; University of Antwerp |

Session 76

Microbiomes: More Than Guts

Chair: Emily Rivest

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|------|---|---|
| 76-1 | Methodology for sampling the microbiome of lizard eggs | Murphy KM, Liles MR, Higgins KV, Mendonca MT, Warner DA; Auburn University |
| 76-2 | Caecilian harbor a distinctive microbiome: Ichthyophis bannanicus (Amphibia, Gymnophiona) and anuran larvae compared | Rajput AP, Meegaskumbura M; Guangxi University |
| 76-4 | Parental care drives microbiome transmission in oviparous skin-feeding caecilians | Kouete MT, Bletz MC, LaBumbard B, Woodhams DC, Blackburn DC; University of Florida, UMass |
| 76-5 | Interactions between oyster physiology and microbiome are influenced by seasonal baselines and water manipulations | Rivest EB, Song B, Audemard C, Carnegie RB; Virginia Institute of Marine Science, William & Mary |
| 76-6 | Pass me the microbes, please! Bearded fireworms source part of their microbiome from bleached and healthy corals and vice versa | Grimes CJ, Labonté JM, Lopez JV, Schulze A; Texas A&M University at Galveston, Nova Southeastern University |
| 76-7 | Do bumble bees cultivate yeast to augment protein in the larval diet? | Waybright SA, Dillon ME; University of Wyoming |

Session 77

Molecular Evolution

Chair: Aide Macias-Muñoz

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|------|---|--|
| 77-1 | Opsin evolution and color vision in jumping spiders | Steck M, Sung JY, Outomuro D, Maddison WP, Morehouse N, Porter ML; University of Hawai'i at Mānoa, University of Cincinnati, University of British Columbia |
| 77-2 | Potential genomic loss of hemoglobin genes in the blind Mexican cavefish, <i>Astyanax mexicanus</i> as a consequence of life in hypoxic caves | Boggs TE, Gross JB; University of Cincinnati |
| 77-3 | Evolution of novel self-identities by point mutation in an allorecognition molecule | Huene AL, Chen TM, Nicotra ML; University of Pittsburgh |
| 77-4 | How much convergence exists in vision-related genes of independently evolved eyes in Cnidaria? | Macias-Muñoz A, Piccioni N, Murad R, Mortazavi A, Oakley TH; University of California Santa Barbara, University of California Irvine |
| 77-5 | Genomic analysis of Actinopterygian hypoxia-inducible factor alpha reveals "missing ohnologs" | Townley IK, Rees BB; Saint George's School, University of New Orleans |
| 77-6 | Sequencing and assembly of the <i>Cerianthus borealis</i> genome | Spillane JL, MacManes MD, Plachetzki DC; University of New Hampshire |
| 77-7 | AniProtDB: A collection of metazoan proteomes for comparative studies | Barreira SN, Nguyen AD, Moreland RT, Baxeavanis AD; NHGRI/NIH |
| 77-8 | The visual genes associated with eye reduction and loss in bat flies (Streblidae, Nycteribiidae) | Atkins ML, Dittmar K, Dick C, Lutz HL, Speer KA, Davis SR, Aardema ML, Porter ML; University of Hawai'i at Mānoa, National Science Foundation, Western Kentucky University, Field Museum of Natural History, Smithsonian Institution, American Museum of Natural History, Montclair State University |
| 77-9 | Co-diversification of scorpion mammalian predators and mammal-specific sodium channel toxins in scorpion venom | Santibanez-Lopez CE, Ballesteros JA, Baker CM, Gavish-Regev E, Sharma PP; Eastern Connecticut State University, University of Wisconsin-Madison, Hebrew University of Jerusalem |

Contributed Talks

77-10 Evolution of molluscan opsin repertoire

McElroy KE, Serb JM; Iowa State University

Session 78

Movement, Migration and Dispersal Behaviors I

Chair: Ben Vernasco

- 78-1 Passerine stopover strategy at a desert edge depends on the time it takes to start accumulating fuel before departure
- 78-2 Homing behavior in native range *Rhinella marina*
- 78-3 Do parental roles shape species and sex difference in poison frog space use and navigation?
- 78-4 Assessing the impact of social cues on the termination of migration in a nomadic migrant, the pine siskin (*Spinus pinus*)
- 78-5 Social cues advance timing of migratory preparations in a seasonal nomad
- 78-6 Quantitative analysis of bird migration over Israel
- 78-7 Landscape structure and movement in the desert grassland whiptail *Aspidoscelis uniparens*

ZinBmeister D, Sapir N*; University of Haifa

Shaykevich DA, Pašukonis A, O'Connell LA; Stanford University

Pašukonis A, Serrano Rojas SJ, Fischer MT, Loretto MC, Shaykevich D, Rojas B, Roland A, Marcillo A, Ringler E, Ringler M, Coloma LA, O'Connell L; Stanford University, Max Planck Institute of Animal Behavior, University of Jyväskylä, INSERM, Centro Jambatu for Research and Conservation of Amphibians, Bern University

Vernasco BJ, Cornelius JM, Watts HE; Washington State University, Oregon State University

Bobo JB, Vernasco BJ, Watts HE, Cornelius JM; Eastern Michigan University, Washington State University, Oregon State University

Schekler I, Sapir N; University of Haifa

Reynolds HS, Sunnarborg J; University of Kansas

Session 79

Movement, Migration and Dispersal Behaviors II

Chair: Ben Vernasco

- 79-1 Age-class differences in wintering distributions among broad-winged hawks
- 79-2 Age dependent search behavior in the Colorado Checkered Whiptail *Aspidoscelis neotesselata*
- 79-4 Methods of estimating lizard space use: a comparison of methods across species, sex, and age classes
- 79-5 Morphology, vision, and the risk of collision mortality in birds
- 79-7 Effect of temperature and group size on the collective response of fish to a threat
- 79-8 Stay or leave? Answers from migratory waggle dances in natural colonies of *Apis dorsata*
- 79-9 Analysis of environment dependent locomotion of bottlenose dolphins using Mask R-CNN

Heveran PH, Goodrich LJ, Leese JM; DeSales University, Hawk Mountain Sanctuary

Pedersen RW, Liu EF; Colorado State University, University of Kansas

Kusaka C, Valdivia J; Erell Institute

Jackson EK, Elmore JA, Loss SR, Winger BM, Dakin R; Carleton University, Oklahoma State University, University of Michigan

Kuruville M, Berdahl A, Dell A, Knouft J; University of Washington, National Great Rivers Research and Education Center, Saint Louis University

Vijayan S, Somanathan H; Indian Institute of Science Education and Research Thiruvananthapuram

Zhang Z, Zhang D, Gabaldon J, West N, Barton K, Shorter KA; University of Michigan Ann Arbor, Dolphin Quest

Session 80

Muscle-Tendon Structure-Function

Chair: Brooke Christensen

- 80-1 Elastic energy storage across speeds during steady state hopping of desert kangaroo rats (*Dipodomys deserti*)
- 80-2 Muscles modified for elastic energy storage enhance jump performance in frogs
- 80-3 Restricting jumping during growth does not alter energy storage capacity
- 80-4 In-vivo muscle-tendon unit length-change for the mouse soleus and tibialis anterior
- 80-5 The effect of recruitment intensity on the plateau width of the muscle force-length relationship

Christensen BA, Schwaner MJ, Lin DC, McGowan CP; University of Idaho, Moscow, Washington State University

Mendoza E, Azizi E; University of California Irvine

Cox SM, DeBoef A, Salzano MQ, Katugam K, Piazza SJ, Rubenson J; University of California Irvine, Pennsylvania State University

Shah K, Hardiman E, Shehaj A, Konow N; University of Massachusetts Lowell

DeLap SJC, Rimkus B, Shehaj A, Taylor-Burt K, Konow N; UMass Lowell, Harvard University

Contributed Talks

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|--------------|---|--|
| 80-6 | A little damping goes a long way | <i>Heim S, Millard M, Le Mouel C, Badri-Spröwitz A; Max Planck Institute for Intelligent Systems, University of Heidelberg, University of Münster</i> |
| 80-7 | Architectural elasticity in pennate muscle | <i>Petersen JC, Eng CM, Marsh RL, Azizi E, Roberts TJ; Brown University, University of California Irvine</i> |
| 80-8 | Impact of whole-muscle shear and fascicle curvature on architectural gear ratio | <i>Brainerd EL, Jimenez YE, Weller HI; Brown University</i> |
| 80-9 | Open-source software for modeling biological latch mediated spring actuated systems | <i>Cook A, Pandhigunta K, Didcock RL, Castro JT, Acevedo MA, Walker A, Acharya R, Crofts SB, Bhamla MS, Anderson PSL, Patek SN, Ilton M; Harvey Mudd College, Georgia Institute of Technology, University of Illinois at Urbana-Champaign, Duke University</i> |
| 80-10 | Functional morphology and biomechanics of trap-jaw ants in the Daceton genus group | <i>Gibson JC, Suarez AV; University of Illinois at Urbana-Champaign</i> |
| 80-11 | Strike kinematics of the araneoid trap jaw spider <i>Pararchaea alba</i> | <i>Kallal RJ, Wood HM; National Museum of Natural History, Smithsonian Institution</i> |
| 80-12 | A new muscle model including a titin element | <i>Jeong SW, Rice NA, Daley MA, Nishikawa KC; Northern Arizona University, University of California Irvine</i> |

Session 81

Neuroanatomy and Neurobiology

Chair: Emily Peele

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|--------------|---|---|
| 81-1 | Morphology and neuroanatomy of the femoral chordotonal organ in the Oleander hawkmoth, <i>Daphnis nerii</i> | <i>Virdi S, Sane S P; Tata Institute of Fundamental Research</i> |
| 81-2 | Intraspecific variation in the avian sensory system and an assessment of minimal sample size for comparative studies | <i>Martin M, Iwaniuk AN, Logue D; University of Lethbridge</i> |
| 81-3 | Ontogenetic trends in the endocranial flexure of archosaurs | <i>King JL, Rayfield EJ, Benton MJ; University of Bristol</i> |
| 81-4 | Comparative neuromorphology and function of Purkinje cells in geckos, mice, and chickens | <i>Liu YL, Bradley S, Patel AV, Bailey CDC, Vickaryous MK; University of Guelph</i> |
| 81-5 | oculomotor nuclei size reflects behavior in nocturnal and diurnal raptors | <i>Cunha F, Gutiérrez-Ibáñez C, Wylie DR, Iwaniuk AN; University of Lethbridge, University of Alberta</i> |
| 81-6 | Ontogenetic shifts in the nervous system of the sockeye salmon, <i>Oncorhynchus nerka</i> | <i>Rheinsmith S, Quinn T, Yopak K; University of North Carolina Wilmington, University of Washington</i> |
| 81-7 | Older and Wiser? Ontogenetic shifts in brain size and brain organization in the Atlantic sharpnose shark, <i>Rhizoprionodon terraenovae</i> | <i>Laforest KV, Peele EE*, Yopak KE; University of North Carolina Wilmington</i> |
| 81-8 | Injury-mediated neurogenesis in the brain of the leopard gecko (<i>Eublepharis macularius</i>) | <i>Austin LE, Graham C, Vickaryous MK; University of Guelph</i> |
| 81-9 | Investigating the role of the transcription factor Cut in the lens secreting Semper cells of insect compound eyes | <i>Rathore S, Meece M, Cook T, Buschbeck E; University of Cincinnati, Wayne State University</i> |
| 81-10 | Comparative oxytocin and vasopressin neurocircuitry in relation to mating system in <i>Eulemur</i> | <i>Sharma A, Grebe NM, Freeman SM, Bales KL, Patisaul HB, Drea CM; Duke University, University of California Davis, North Carolina State University</i> |

Session 82

Neuroethology

Chair: Andrew Gordus

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|-------------|--|---|
| 82-1 | Constitutive gene expression differs in three brain regions important for cognition in neophobic and non-neophobic house sparrows (<i>Passer domesticus</i>) | <i>Lattin CR, Johnson KM, Kelly TR; Louisiana State University, California Polytechnic State University</i> |
| 82-2 | Conserved neural circuitry for frog vocalizations | <i>Yamaguchi A, Peltier M; University of Utah</i> |
| 82-3 | Neural expression of two immediate early genes do not differ in response to novel objects in neophobic and non-neophobic house sparrows (<i>Passer domesticus</i>) | <i>Kimball MG, Kelly TR, Stansberry KR, Lattin CR; Louisiana State University</i> |

Contributed Talks

82-4	A common fungicide, Pristine®, impairs olfactory associative learning in honey bees (<i>Apis mellifera</i>)	<i>DesJardins NS, Fisher AL, Harrison JF, Smith BH; Arizona State University</i>
82-5	Characterization of visually-guided behaviors by the nudibranch, <i>Berghia stephanieae</i>	<i>Quinlan PD, Cho AK, Katz PS; University of Massachusetts</i>
82-6	Untangling the web of behaviors used in spider orb weaving	<i>Gordus A, Corver A, Wilkerson N, Miller J; Johns Hopkins University</i>
82-7	Axial touch sensation and its effects on motor output and swimming behavior in larval zebrafish	<i>Menelaou E, Katz HR, Hale ME; University of Chicago, Marine Biological Laboratory</i>
82-8	Spike timing changes between power muscles in pitch and roll turns of a hawk moth, <i>M. sexta</i>	<i>Putney J, Sponberg S; Georgia Tech</i>
82-9	Neural regulation of tadpole aggression	<i>McKinney JE, Ludington S, O'Connell LA; Stanford University</i>
82-10	Characterizing vertebrate odor space	<i>Zung JL, McBride CS; Princeton University</i>
82-12	Neural correlates of vertebrate affiliative evolution	<i>Nowicki JP, Sailer LS, Ophir AG, Gardner MG, Coker DC, O'Connell LA; Stanford University, Cornell University, Flinders University, King Abdullah University of Science and Technology</i>

Session 83

Osmoregulation

Chair: Michelle Monette

83-1	Gill transcriptomic response to seawater is altered by acute stress in Atlantic salmon smolts	<i>Monette MY, Velotta JP; Western Connecticut State University, University of Denver</i>
83-2	A data-independent acquisition (DIA) assay library for quantitation of environmental effects on the kidney proteome of <i>Oreochromis niloticus</i>	<i>Root L, Cnaani A, Campo A, MacNiven L, Kültz D; University of California Davis, Agricultural Research Organization</i>
83-3	Functional expression of insect Na ⁺ -dependent cation-chloride cotransporters in Sf9 cells	<i>Duong PC, Holmes HL, Piermarini PM, Romero MF, Gillen CM; Kenyon College, Mayo Clinic, Ohio State University</i>
83-4	Physiological plasticity of the mayfly, <i>N. triangulifer</i> , in response to salinity stress in freshwater ecosystems	<i>Orr SE, Buchwalter DB; North Carolina State University</i>
83-5	Effects of diet on aquaporin abundance in the disease-vector mosquito, <i>Aedes aegypti</i>	<i>Picinic BN, Paluzzi JP, Donini A; York University</i>
83-6	Physiological effects of salinity stress in wild American alligators (<i>Alligator mississippiensis</i>)	<i>Faulkner PC, Elsey R, Hala D, Petersen LH; Texas A&M University at Galveston, Louisiana Department of Wildlife and Fisheries</i>
83-7	How does an amphibious fish osmoregulate without gills?	<i>Ridgway MR, Tunnah L, Bernier NJ, Wright PA; University of Guelph</i>

Session 84

Parental Care

Chair: Ivana Schoepf

84-1	Do females work harder? Sexual differences in parental care in the Little swift (<i>Apus affinis</i>), a monomorphic species	<i>Bloch I, Troupin D, Sapir N; University of Haifa</i>
84-2	Maternal care increases with the presence of extra pair offspring in wild song sparrows	<i>Lane SJ, Brewer VB, VanDiest IJ, Linkous CR, Mabry KE, Sewall KB; Virginia Tech, Oregon State University, Kennesaw State University, New Mexico State University</i>
84-3	Why do mothers care? Assessing the benefits of female–neonate associations in a viviparous lizard from the Argentine Puna	<i>Valdecantos S, Wenner SM, Robertson JM, Espinoza MH, Lobo Terán C, Espinoza RE*; Universidad Nacional de Salta and Consejo Nacional de Investigaciones Científicas y Técnicas, California State University Northridge, Valley International Preparatory High School, Universidad Nacional de Salta</i>
84-4	Sex and strife: parental cooperation in a songbird species with flexible biparental care	<i>Enns JL, Purdey L, Stojkovic L, Williams TD; Simon Fraser University</i>
84-5	Negotiations over offspring care: a test of alternative hypotheses in the clown anemonefish	<i>Barbasch TA, Branconi R, Francis R, Pacaro M, Srinivasan M, Jones GP, Buston PM; Boston University, James Cook University</i>
84-6	Experimental evidence of haemosporidian infection effects on maternal care behavior in a wild passerine	<i>Schoepf I, Olson S, Moore IT, Bonier F; Queen's University, Virginia Tech</i>
84-8	The interplay between sperm-mediated and care-mediated paternal effects in threespined sticklebacks	<i>Hellmann JK, Carlson ER, Bell AM; University of Dayton, University of Illinois</i>

Contributed Talks

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| 84-9 | Angry birds: the personality of parental aggression and its fitness consequences in an island passerine | Suckow N, Pollock HS, Kastner M, Hauber ME, Rogers HS; UIUC, Iowa State University, Iowa State University |
| 84-10 | Noisy neighbors: how do human activity and habitat disturbance impact the nest site selection of tree swallows and eastern bluebirds? | Howerin HM, Foltz SL, Moore IT, Hernandez J; Radford University, Virginia Tech |
| 84-11 | Heterospecific but not conspecific parasitism delays fledging in host prothonotary warblers | Scharf HM, Stenstrom KH, Hauber ME, Schelsky WM; University of Illinois at Urbana-Champaign |
| 84-12 | Early post-natal maternal effects on voluntary physical activity, exercise physiology, and associated traits in mice | Cadney MD, Schwartz NL, Schmill MP, Castro AA, McNamara MP, Hillis DA, Garland TJR; University of California Riverside |
| 84-13 | Chickadees increase provisioning effort to compensate for poor prey quality during the nestling period | Senécal S, Riva JC, O'Connor RS, Nozais C, Vézina F; Université du Québec à Rimouski |

Session 85

Phenotypic Plasticity

Chair: Kate Augustine

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| 85-1 | Evolution and plasticity of thermal performance in 12 New Zealand stick insect species (Phasmatodea) | Augustine KE, Cubillos CA, Roberts HE, Sinclair BJ, Buckley TR; Manaaki Whenua, Western University |
| 85-2 | Symbiosis in the time of climate change: Bleaching of <i>Exaipasia pallida</i> in response to concurrent warming and acidification | Romanovich LA, Rade RG, Fetcher N, Voltzow J; University of New England, University of Scranton, Wilkes University |
| 85-3 | Thermal tolerances of the Caribbean sea urchins <i>Eucidaris tribuloides</i> , <i>Echinometra lividis</i> , and <i>Echinometra lucunter</i> (Echinodermata: Echinoidea): Potential impacts of climate change | Collins-Jencarelli C, Green L, Hranitz J, Venn C, Klinger T; Bloomsburg University |
| 85-4 | Variation in the evolution and expression of phenotypically plastic structures | Miller K, Fuentes P, O'Brien DM, Angelini DR; Colby College |
| 85-5 | Is phenotypic plasticity a common driver of shell shape variation in freshwater gastropods? | Whelan NV; United States Fish and Wildlife Service, Auburn University |
| 85-6 | Morphological plasticity, not social behavior, may maintain diet breadth in leaf-footed bugs | Zlotnik S, Allen PE, Miller CW; University of Florida, Council on International Education Exchange |
| 85-7 | Gene-environment interactions shape transcriptomic and organismal responses to combined ethanol and temperature environments in the fruit fly <i>Drosophila melanogaster</i> | El-Shesheny IA, Matoo OB, O'Brien K, Meiklejohn CD, Montooth KL; University of Nebraska-Lincoln, Tanta University, University of Nebraska-Lincoln, Ohio State University |
| 85-8 | Transcriptional responses to thermal and oxygen stress in a montane leaf beetle | Elmore JW, Stillman JH, Dahlhoff EP, Rank NE; Sonoma State University, Santa Clara University, University of California Berkeley, San Francisco State University |
| 85-9 | Adaptive plasticity as an indirect fitness benefit of mate choice in variable environments | Kelly PW, Pfennig DW, Pfennig KS; University of North Carolina at Chapel Hill |

Session 86

Photosynthesis, Respiration, and Ventilation

Chair: Jon Harrison

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|-------------|---|---|
| 86-1 | Leaf anatomical evolution in three origins of CAM photosynthesis | Leiblich A, Heyduk K*, Edwards E; University of Hawai'i, Yale University |
| 86-2 | Time scales of mixing in an imperforate scleractinian coelenteron | Williams SD, Patterson MR; Mote Marine Laboratory, Northeastern University, Boston |
| 86-3 | How to be a giant: hypermetric scaling of leg tracheal systems in cockroaches and scarab beetles suggests oxygen transport to the legs limits maximal insect size | Harrison JF, Wagner JM, Aivazian V, Duell ME, Klok CJ, Weed M, Munoz E, Vandenbrooks JM, Fezzaa K, Socha JJ; Arizona State University, Argonne National Labs, Virginia Tech |
| 86-4 | Clade-specific metabolic allometries in the non-avian reptiles | Giancarli SM, Dunham AE, O'Connor MP; Drexel University, University of Pennsylvania |
| 86-5 | Development of apneustic breathing in Weddell seal (<i>Leptonychotes weddellii</i>) pups | Fiskum EM, Pearson LE, Weitzner EL, Petch S, Rotella J, Schroth-Glanz M, Glanz H, Liwanag HEM; California Polytechnic State University, San Luis Obispo, Montana State University |

Contributed Talks

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| 86-6 | Anatomy, variation, and asymmetry of the bronchial tree in the African grey parrot (<i>Psittacus erithacus</i>) | Lawson AB, Hedrick BP, Echols MS, Schachner ER; Louisiana State University Health Sciences Center, Medical Center for Birds |
| 86-7 | Anatomy, ontogeny, and evolution of the respiratory system in Alligator mississippiensis and <i>Struthio camelus</i> | Schachner ER, Hedrick BP, Richbourg HA, Hutchinson JR, Farmer CG; Louisiana State University, University of California San Francisco, Royal Veterinary College, University of London, University of Utah |
| 86-8 | Experimental morphology of the alligator diaphragm | Young BA, Greer S, Cramberg M; Kirksville College of Osteopathic Medicine |

Session 87

Phylogenetics

Chair: Jesus Ballesteros

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| 87-1 | It's the cute ones you have to watch out for: phylotranscriptomic analysis of velvet worms (phylum Onychophora) and the continued recalcitrance of Peripatidae | Baker CM, Buckman-Young RS, Giribet G; Harvard University |
| 87-2 | The oldest modern bird fossil, and the early evolutionary history of crown group birds | Field DJ, Benito J, Chen A, Jagt J, Ksepka DT; University of Cambridge, Natural History Museum Maastricht, Bruce Museum |
| 87-3 | Evaluating the use of ultraconserved elements to determine species boundaries and population structure in the octocoral genus <i>Alcyonium</i> | Erickson KL, Quattrini AM, McFadden CS; Harvey Mudd College, Smithsonian Institution |
| 87-4 | On consilience and the phylogeny chelicerate arthropods | Ballesteros JA, Sharma PP; University of Wisconsin-Madison, |
| 87-5 | Large bodied Felidae from Pakistan | Kuhn BF, Röbner GE; University of Johannesburg, Bayerische Staatssammlung für Paläontologie und Geologie |
| 87-6 | Gazing at origins and losses: the evolution of mantle eyes and eyespots in bivalves (<i>Bivalvia</i> : Pteriomorpha) | Audino JAA, Serb JM, Marian JEA; Iowa State University, University of São Paul |
| 87-7 | Molecular systematics and phylogeography of the blue monkey, <i>Cercopithecus mitis</i> , in Central and East Africa | Larkin-Gero ER, Leroy A, Hart JA, Hart TB, Brown M, Detwiler KM; Florida Atlantic University, Santa Ana College, Frankfurt Zoological Society, DRC, UC Santa Barbara |
| 87-8 | Phylogenetic and population genetic analyses of the western terrestrial garter snake (<i>Thamnophis elegans</i>) reveal distinct evolutionary lineages and biogeographic patterns across western North America | Hallas JM, Parchman TL, Feldman CR; University of Nevada Reno |
| 87-9 | BUSCO-based phylogenomics resolves major cephalopod clades and placement of new pygmy lab models | Deng LC, Edsinger E; Salk Institute |
| 87-10 | Phylogeny and biogeography of the New Zealand mite harvestman genus <i>Rakaia</i> , based on ultraconserved elements (UCEs) | Morisawa R, Derkarabetian S, Boyer SL; Macalester College, Harvard University |

Session 88

Physiology of Immunity and Reproduction

Chair: Charles "Matt" Watson

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|------|--|--|
| 88-1 | Body temperature as indicator and driver for costs associated with avian humoral immune response | Bryla A, Zagkle E, Sadowska ET, Cichon M, Bauchinger U; Jagiellonian University, Nencki Institute of Experimental Biology |
| 88-2 | Systemic hormonal and immune regulation induced by intraperitoneal LPS injection in bullfrogs (<i>Lithobates catesbeianus</i>) | Figueiredo AC, Titon SCM, Titon BJ, Vasconcelos-Teixeira R, Barsotti AMG, Gomes FR; Universidade de São Paulo - Instituto de Biociências |
| 88-3 | Social and reproductive state influences the immune response in an African cichlid fish | King TP, Maruska KP; Louisiana State University |
| 88-4 | Examining the combined effects of cold storage and CO2 narcosis on bumble bee queen reproduction | Treanore ED, Amsalem E; Pennsylvania State University |
| 88-5 | Farming fecund crickets: fruitful female fertility from feeding crickets royal jelly | Muzzatti MJ, MacMillan HA, Bertram SM; Carleton University |
| 88-6 | First collection and characterization of semen in a West Indian manatee (<i>Trichechus manatus</i>) | Coward JR, Collins DM, Mignucci-Giannoni AA, Alejandro-Zayas T, Rivera-Guzman AL, Larkin IV; University of Florida, Inter American University of Puerto Rico |

Contributed Talks

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| 88-7 | Molecular basis for copulatory plug in garter snakes | <i>Ghione CR, Coradini A, Ehrenreich I, Dean M; University of Southern California</i> |
| 88-8 | Temperature, oxygen, and the origins of viviparity | <i>Watson CM, Cox CL; Midwestern State University, Florida International University</i> |
| 88-9 | Behavioural adaptations in egg laying ancestors facilitate evolutionary transitions to live birth | <i>Pettersen AK, Cornwallis CK, Uller T, Feiner N, Noble DWA, While GM; Lund University, Australian National University, University of Tasmania</i> |
| 88-10 | Do thermal fluctuations affect gene expression differently than constant conditions? | <i>Breitenbach AT, Paitz RT, Bowden RM; Illinois State University</i> |

Session 89

Plasticity, Epigenetics, Stress, and Novelty

Chair: *Eric Gangloff*

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|-------------|---|--|
| 89-1 | The role of plasticity in facilitating colonization of novel environments | <i>Barts N, Nieves N, Trojan S, Arias-Rodriguez L, Kelley J, Tobler M; Kansas State University, Washington State University, Universidad Juarez Autonoma de Tabasco</i> |
| 89-2 | The creative role(s) of stress in evolution: from co-option to novelty | <i>Love AC, Wagner GP; University of Minnesota, Yale University</i> |
| 89-3 | Epigenetic potential in house sparrow (<i>Passer domesticus</i>) introductions | <i>Hanson HE, Wang C, Zimmer C, Schrey AW, Liebl AL, Ravinet M, Jiang RHY, Maddox JD, Martin LB; University of South Florida, Georgia Southern University, University of South Dakota, University of Nottingham, Field Museum of Natural History, Universidad Científica del Perú, American Public University System</i> |
| 89-4 | Plasticity in thermoregulatory behavior and performance in response to hyperoxia in a high-elevation specialist lizard, <i>Iberolacerta bonnali</i> | <i>Spears S, Kouyoumdjian L, Pettit C, Aubret F, Gangloff EJ; Ohio Wesleyan University, Station d'Ecologie Theorique et Experimentale du CNRS</i> |
| 89-5 | Adaptation and plasticity in the multivariate thermal phenotype of common wall lizards | <i>Gangloff EJ, Bodensteiner BL, Kouyoumdjian L, Muñoz MM, Aubret F; Ohio Wesleyan University, Yale University, Station d'Ecologie Theorique et Experimentale du CNRS</i> |
| 89-6 | Temporal variation of cytokine gene expression during the inflammatory response in toads | <i>Floreste FR, Ferreira LF, Titon Jr B, Titon SCM, Muxel SM, Gomes FR, Assis VR; University of Sao Paulo, Santo Andre Foundation University Center</i> |
| 89-7 | Both gene expression and physiology respond plasticity to thermal stress in a tropical forest lizard | <i>Rosso AA, Logan ML, McMillan WO, Cox CL; Georgia Southern University, University of Nevada Reno, Smithsonian Tropical Research Institute, Florida International University</i> |
| 89-8 | How to exhibit "positive tolerance": Lessons from the mammalian uterus | <i>Stadtmauer DJ, Wagner GP; Yale University</i> |
| 89-9 | Genetic constraints, gene expression plasticity, and the importance of extreme weather events in the evolutionary response to climate change | <i>Logan ML, Cox CL; University of Nevada Reno, Florida International University</i> |

Session 90

Pollution and Ecotoxicology

Chair: *Michael Bertram*

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|-------------|---|--|
| 90-1 | Disruption of male mating strategies in a chemically compromised environment | <i>Bertram MG, Tomkins P, Saaristo M, Martin JM, Michelangeli M, Tomkins RB, Wong BBM; Swedish University of Agricultural Sciences, Monash University, University of California Davis, Department of Environment, Land, Water and Planning (DELWP)</i> |
| 90-2 | Potential impacts of lithium mining on vulnerable species and ecosystems | <i>Paterniti MC, Davis JE; Radford University</i> |
| 90-3 | Physiological and genetic effects of deepwater horizon oil and dispersant on a developing marine sponge model (<i>Cinachyrella</i> sp) | <i>Desplat Y, Warner JF, Smith E, Vijayan N, Blackwelder P, Lopez JV; Nova Southeastern University, University of North Carolina at Wilmington</i> |
| 90-4 | Fluoxetine impacts behaviors of non-target organisms in acidified ocean | <i>Lo HKA, Chua VA*, Chan KYK; Hong Kong University of Science and Technology, Swarthmore College</i> |

Contributed Talks

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| 90-5 | Effects of different roadway deicing salts on host-parasite interactions: the importance of salt type | Buss N, Nelson KN, Hua J, Relyea RA; Binghamton University, Rensselaer Polytechnic Institute |
| 90-6 | Effect of anthropogenic sodium on chemical defense and coloration in monarch butterflies | Kobiela ME, Zambre A, Snell-Rood EC, Agrawal AA; University of Nebraska Lincoln, University of Minnesota Twin Cities, Cornell University |
| 90-7 | Effects of road salt and its alternatives on freshwater invertebrates | Stander RM, Cahill AE; Albion College |
| 90-8 | Analysis of microplastic pollution on three Texas state park beaches | Hayden MJ, Wicksten MK; Texas A&M University |
| 90-9 | Environmentally relevant pesticide cocktail and heat stress co-exposure affect osmoregulation and antioxidant system of goldfish gill and kidney | Lacy B, Rivera M, Rahman MS, Rahman MS; University of Texas Rio Grande Valley |
| 90-10 | Parasitoid wasp community dynamics in vineyards following insecticide application | Schindler BY, Gavish-Regev E, Keasar T; University of Haifa, Hebrew University of Jerusalem |
| 90-11 | Nighttime atmospheric oxidation of floral scent impacts the ability of hawkmoths to locate a floral scent source | Chan JK, Thornton JA, Riffell JA; University of Washington |

Session 91

Population Genetics and Phylogeography

Chair: Misha Matz

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| 91-1 | Using population genomics to understand the influence of biogeographic barriers on <i>Templetonia hookeri</i> (Fabaceae), an endemic legume of the Australian monsoon tropics | Williams TM, Antoine AO, Martine CT; Bucknell University |
| 91-2 | Genetic consequences of coral range expansion | Fifer JF, Yamakita T, Yasuda N, Davies SW; Boston University, Japan Agency for Marine-Earth Science and Technology, University of Miyazaki |
| 91-3 | Genetic markers associated with hard clam resistance to QPX disease | Farhat S, Tanguy A, Espinosa EP, Guo X, Boutet I, Smolowitz R, Murphy D, Rivara GJ, Allam B; Stony Brook University, Sorbonne Université, Rutgers University, Roger Williams University, Cape Cod Cooperative Extension, Cornell Cooperative Extension |
| 91-4 | A tale of two morphs: Phylogeography of <i>Neopurcellia salmoni</i> , with the first report of male polymorphism in the harvestman suborder Cyphophthalmi | Tardelli Canedo P, Baker CM, Morisawa R, Pessereau EJ, Boyer SL; Macalester College, Harvard University |
| 91-5 | Strong genome-wide association signal for coral's ability to host heat-tolerant symbionts | Matz MV, Fuller ZL; University of Texas at Austin, Columbia University |
| 91-6 | Population genomics of <i>Saccoglossus kowalevskii</i> | Redak CA, Stevison LS, Halanych KM; Auburn University |
| 91-7 | Using the effect of new mutations to better understand the genetic basis of thermal sensitivity | Miller CL, Dugand R, Franklin CE, McGuigan KM; University of Queensland |
| 91-8 | Population connectivity of an endangered gastropod across the Mediterranean | Cunha TJ, Pavón A, Espinosa F, García-Gómez JC, Giribet G, de Medeiros B; Museum of Comparative Zoology, Harvard University, Smithsonian Tropical Research Institute, Universidad de Sevilla |
| 91-9 | Mitochondrial effects on sex-specific aging and age-related phenotypes in a copepod without sex chromosomes | Flanagan BA, Li N, Edmonds S; University of Southern California |
| 91-10 | The effects of mitochondria on sex-specific transcriptomic responses to aging in the copepod <i>Tigriopus californicus</i> | Li N, Flanagan BA, Edmonds S; University of Southern California Los Angeles |

Session 92

Reproduction

Chair: Jamie Cornelius

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|-------------|--|---|
| 92-1 | The Garden of Eden revisited: Snakes, sex, and scents - A tribute to David Crews | Mason RT, Bentz EJ; Oregon State University, Cornell University |
| 92-2 | Do tadpole-transporting frogs use stagnant water odor to find pools in the rainforest? | Serrano-Rojas SJ, Pašukonis A; Stanford University |
| 92-3 | Do female lizards choose nest sites based on the predictability of substrate moisture? | Warner DA, Pruett JE, Fargevielle A, Klabacka RL; Auburn University |

Contributed Talks

92-4	Effects of male dusky dolphin mating behaviors on durations and rates of copulation	<i>Trickey AK, Orbach DN; Texas A&M University Corpus Christi</i>
92-5	Gliding treefrog reproduction: Possible functions of diverse male behavior in terrestrial breeding aggregations	<i>Güell BA, Gomez EK, Warkentin KM; Boston University</i>
92-6	Protein and DNA labeling techniques suggest that diploid populations of sexually reproducing <i>Lumbriculus</i> cross-fertilize	<i>Tweeten KA, Scollick JA; St. Catherine University</i>
92-7	Longitudinal study of sea turtle nesting behavior on a large Gulf of Mexico rookery	<i>Lasala JA, Bernhard MC, Mazzarella KT; Mote Marine Laboratory</i>
92-8	Breeding habitat, mating system, and mating success in the sponge-dwelling goby <i>Elacatinus lori</i>	<i>Francis RK, Catalano KA, Majoris JE, D'Aloia CC, Ruger T, Bogdanowicz S, Buston PM; Boston University, Rutgers University, King Abdullah University, University of New Brunswick, University of Exeter, Cornell University</i>
92-9	How does variation in the resource landscape influence mating dynamics in the insect <i>Narnia femorata</i> ?	<i>Greenway EV, Miller CW; University of Florida</i>
92-10	Drivers of seasonal opportunistic breeding in the north temperate zone	<i>Cornelius JM, Hahn TP; Oregon State University, University of CA-Davis</i>
92-11	Winners versus losers: reproductive characteristics of a nonnative and native mussel species in Bolinao, Pangasinan, Philippines	<i>Cabiguin MM, Meñez MAJ; Marine Science Institute University of the Philippines</i>
92-12	A pheromone antagonist deters female sea lamprey from more senescent mates	<i>Buchinger TJ, Fissette SD, Bussy U, Li K, Huerta B, Buchinger EG, Brant CO, Johnson NS, Li W; Michigan State University, US Geological Survey Hammond Bay Biological Station</i>
92-13	Is energetics or competition a stronger driver of the seasonal timing of reproduction by male smallmouth bass?	<i>Laroche RAS, Weinersmith K, Angeloni LM, Wiegmann DD, Egan SP; Rice University, Colorado State University, Bowling Green State University</i>

Session 93

Sensory Biology and Neuroethology

Chair: Amanda Franklin

93-1	Does an ecologically-relevant odor influence visual motion selectivity in the hawkmoth nerve cord?	<i>Gage S, Aiello BA, Sharma V, Sprayberry J, Sponberg S; Georgia Tech, Muhlenburg College</i>
93-2	The sensory space of the threespine stickleback	<i>Mobley RB, Boughman JW; Michigan State University</i>
93-3	Associating functional morphology of the lumbosacral organ and locomotion modalities in avians	<i>Kamska V, Contreras FB, Daley M, Badri-Spröwitz A; MPI for Intelligent Systems, University of California Irvine</i>
93-4	Behavioral effects to heat in larval <i>Drosophila</i> with and without TRPA1 receptors in sensory neurons and the medicinal blow fly (<i>Phaenicia sericata</i>)	<i>deCastro N, Marguerite NT, Bernard J, Harris D, Cooper RL; University of Kentucky</i>
93-5	Mirror camouflage: Busting the myth	<i>Franklin AM, Rankin KJ, Ospina-Rozo L, Medina I, Garcia JE, Dong CM, Ng L, Wang L-Y, Aulsebrook AE, Stuart-Fox D; University of Melbourne, RMIT University</i>
93-6	Ecological predictors of eye size in deep-sea shrimp	<i>Schweikert LE, Thomas KN, Moreno VM, Casaubon A, Golightly C, Bracken-Grissom HD; Florida International University, Natural History Museum, Florida Institute of Technology, Tennessee Technological University</i>
93-7	The effect of habitat on visual sensitivity across animal phyla	<i>Murphy MJ, Westerman EL; University of Arkansas</i>
93-8	Distinguishing between additive and epigenetic effects in light absorbance of mutant retinochromes	<i>Smedley GD, McElroy KE, Serb JM; Iowa State University</i>
93-9	Investigating sensory system variation in the developing butterfly: A molecular approach	<i>Ernst DA, Westerman EL; University of Arkansas</i>
93-10	Population coding of visual motion detection and control of avoidance behaviours in locusts	<i>Zhang S, Gray JR; University of Saskatchewan</i>
93-11	Escape flight performances of night-active malaria mosquitoes: the role of visual and airflow cues of an approaching object	<i>Cribellier A, Spitzen J, Straw AD, van Leeuwen JL, Muijres FT; Wageningen University, Freiburg University</i>
93-12	The innate floral template of a generalist pollinator	<i>Mishra A; National Center for Biological Science</i>

Session 94

Contributed Talks

Sensory Biology I

Chair: Alexandra Kingston

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| 94-1 | Dragon-drop: The passive mechanism and active control of the dragonfly's aerial righting behaviour | <i>Fabian ST, Zhou R, Lin HT; Imperial College</i> |
| 94-2 | <i>Drosophila melanogaster</i> increase steering errors when relying on restricted-area optic flow fields | <i>Palermo N, Hershman M, Proenca M, Theobald J; Florida International University</i> |
| 94-3 | Tradeoffs in spatial integration of optic flow for visual velocity estimation in flying insects | <i>Lingenfelter B, van Breugel F*; University of Nevada</i> |
| 94-4 | Halteres increase takeoff speed in calyptatae | <i>Jordan KA, Yarger AM, Fox JL; Case Western Reserve University</i> |
| 94-5 | Developing a mechanical model for intraspinal mechanosensing in avians | <i>Mo A, Kamska V, Contreras FB, Daley M, Badri-Spröwitz A; MPI for Intelligent Systems, University of California Irvine</i> |
| 94-6 | The wobbly compass needle: are the peculiarities of magnetic orientation behavior partially explained by low signal relative to noise? | <i>Johnsen S, Lohmann KL, Warrant EJ; Duke University, University of North Carolina at Chapel Hill, Lund University</i> |
| 94-7 | A snapping shrimp has the fastest vision of any aquatic animal | <i>Kingston ACN, Chappell DR, Speiser DI; University of Tulsa, University of South Carolina</i> |
| 94-8 | The sensory apparatus of dragonfly wings: sensor distribution and morphologies | <i>Uhrhan MJ, Fabian JM, Siwanowicz I, Lin HT; Imperial College, Flinders University, HHMI Janelia Research Campus</i> |
| 94-9 | Neural encoding and structural properties interact to determine optimal placement of sparse, spiking sensors on an insect wing | <i>Weber AI, Daniel TL, Brunton BW; University of Washington</i> |
| 94-10 | Using finite element analysis to investigate the role of the swim bladder in directional hearing by the plainfin midshipman (<i>Porichthys notatus</i>) | <i>Balebail S, Sisneros JA; University of Washington</i> |
| 94-11 | Flexibility of reflexes: How Johnston's organs modulate the antennal set-point in flying hawkmoths | <i>Natesan D, Dave SD, Saxena N, Sane SP; National Centre for Biological Sciences, KTH Royal Institute of Technology, Case Western Reserve University</i> |
| 94-12 | Bumblebees land by adjusting the set-point of optical expansion rate in a stepwise manner | <i>Goyal P, Cribellier A, Croon G, Lankheet M, Leeuwen J, Pieters R, Muijres F; Wageningen University and Research, Delft University of Technology</i> |

Session 95

Sensory Biology II

Chair: Elias Lunsford

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| 95-1 | Bumblebee sweet taste is encoded by a population of gustatory receptor neurons | <i>Parkinson RH, Kessler S, Miriyala A, Wright GA; University of Oxford, University of Lausanne, University of Oxford</i> |
| 95-2 | Taste bud abundance and distribution on the paired fins of damselfish | <i>Hardy AR, Hale ME; University of Chicago</i> |
| 95-3 | Chemosensory basis of feeding behavior in pacific white shrimp, <i>Litopenaeus vannamei</i> | <i>Eap D, Correa S, Ngo-Vu H, Derby CD; Georgia State University</i> |
| 95-4 | Opsin expression during development in <i>Gonodactylaceus falcatus</i> : Investigating the role of ultraviolet sensitivity in stomatopod larvae | <i>Palecanda S, Steck M, Porter ML; University of Hawai'i at Manoa</i> |
| 95-5 | Deciphering the mechanistic links between larval ecology and host-seeking behavior in mosquitoes | <i>Chandrasegaran K, Vinauger C; Virginia Tech</i> |
| 95-6 | Evolution of eye loss shapes lateral line sensitivity of blind cavefish during swimming: new insights from neurophysiology | <i>Lunsford ET, Keene AC, Liao JC; University of Florida Gainesville, Whitney Laboratory for Marine Bioscience, Florida Atlantic University</i> |
| 95-7 | Auditory threshold differences in recently diverged cave populations of the Mexican tetra <i>Astyanax mexicanus</i> | <i>Enriquez MS, Swanson N, McGaugh SE, Gluesenkamp A, Mensinger AF; University of Minnesota, San Antonio Zoo</i> |
| 95-8 | Ocular transmission across frog and toad diversity | <i>Thomas KN, Gower DJ, Streicher JW, Bell RC, Fujita MK, Schott RK, Douglas RH; Natural History Museum, California Academy of Science, National Museum of Natural History, Smithsonian Institution, University of Texas at Arlington, York University, University of London</i> |

Contributed Talks

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| 95-9 | Visual adaptations in the transition from aquatic to terrestrial light environments in the life cycle of southern leopard frogs | Schott RK, Bell RC, Ellis LR, Thomas KN, Streicher JW, Gower DJ, Fujita MK; York University, National Museum of Natural History, California Academy of Sciences, Cornell University, Natural History Museum, University of Texas Arlington |
| 95-10 | Studying a black box: investigating processing of a receptorless sense | Havens LT, Taylor BK, Lohmann KJ; University of North Carolina Chapel Hill |
| 95-11 | G-protein coupled receptors in chemosensory organs of decapod crustaceans | Rump MT, Kozma MT, Derby CD; Georgia State University, Colorado State University |
| 95-12 | The role of vision and flow sensing in the schooling behavior of giant danios | Tidswell BK, Tytell ED; Tufts University |

Session 96

Sensory Ecology

Chair: Mark Hauber

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| 96-1 | The limits of egg recognition: Testing the acceptance thresholds of American robins in response to egg-shaped objects in the nest | Hauber ME, Winnicki SK, Hoover JP, Hays IR; University of Illinois at Urbana-Champaign, Rutgers-Newark |
| 96-2 | Differences in categorical color perception between two estrildid finches | Nowicki S, Caves EM, Green PA, Zippel MN, Bharath D, Peters S, Johnsen S; Duke University, University of Exeter, Indian Institute of Science |
| 96-3 | Symbiotic magnetic sensing in animals: evidence from metagenomics | Fitak RR; University of Central Florida |
| 96-4 | Neuronal evolution across the Puerto Rican anole radiation | Storks L, Leal M; University of Missouri |
| 96-5 | Electroreception in amphiuma salamanders | Keathley CM, Moon BR; University of Louisiana at Lafayette |
| 96-6 | Magnetoreception and the radio sun | Granger J, Johnsen S; Duke University |
| 96-7 | Lens morphology is influenced by ecology in frogs and toads (Amphibia: Anura) | Mitra AT, Womack MC, Gower DJ, Clark B, Streicher JW, Bell RC, Schott RK, Fujita MK, Thomas KN; University College London, Natural History Museum, Utah State University, California Academy of Sciences, York University, University of Texas |
| 96-8 | Light environment drives the evolution of color vision genes in butterflies and moths | Sondhi Y, Ellis EA, Bybee SM, Theobald JC, Kawahara AY; Florida International University, Florida Museum of Natural History, University of Florida |
| 96-9 | Can branchiopod crustaceans detect predators and/or prey using multimodal sensory integration? | Legg A, Lessios N; Assumption University |
| 96-10 | Finding fruit: Olfactory search strategies in a neotropical bat | Brokaw AF, Page RA, Smotherman M; Texas A&M University, Smithsonian Tropical Research Institution |
| 96-11 | The role of pheromones in mound-building behavior in termites | Ramaswamy SS, Sane SP; National Centre for Biological Sciences, SASTRA University |
| 96-12 | Brain transcriptomic responses of Yarrow's spiny lizard, <i>Sceloporus jarrovi</i> , to conspecific visual or chemical signals | Romero-Díaz C, Xu C, Campos SM, Kusumi K, Hews DK, Martins EP; Arizona State University, Georgia State University, Indiana State University |

Session 97

Sensory Structure-Function

Chair: Kathryn Stanchak

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| 97-1 | Evolution of the lizard middle ear | Sánchez-Martínez PM, Daza JD*, Hoyos JM; Pontificia Universidad Javeriana, Sam Houston State University |
| 97-2 | Biomechanical and morphological fidelity of CT based 3D models for Zebrafish conductive hearing system | Marcé-Nogué J, Liu J; Universitat Rovira i Virgili, Institut Català de Paleontologia Miquel Crusafont, University of California Berkeley, University at Buffalo |
| 97-3 | Three-dimensional imaging of tympanic membranes in a parasitoid fly enables a new model of hearing | Mikel-Stites MR, Salcedo MK, Socha JJ, Staples AE; Virginia Tech |
| 97-4 | The role of the stapes in the evolution of reptilian hearing | Jenkins KM, Bhullar BAS; Yale University |

Contributed Talks

97-5	a 3d finite element model for sound transmission in an amphibian middle ear	<i>Fleming RC, Hoke KL; Colorado State University</i>
97-6	Rapid recoil of filiform insect antennae	<i>McCarter MG, Loudon C; University of California Irvine</i>
97-7	An overview and definition of cirri in fishes	<i>Geldof DL, Summers AP, Cohen KE; University of Washington, Friday Harbor Labs</i>
97-8	The best of both worlds: regional specialization in the mechanosensory system of the silverjaw minnow, <i>Ericymba buccata</i>	<i>Jones AE, Conway KW, Webb JW; University of Rhode Island, Texas A&M University</i>
97-9	Immunohistochemical exploration of hypothesized mechanosensory features in the avian lumbosacral spinal cord	<i>Stanchak KE, Miller KE, Lumsden EW, Davis CG, Brunton BW, Perkel DJ; University of Washington, California Polytechnic State University</i>
97-10	Ecomorphology and morphological diversity of trigeminal nerve-mediated somatosensation in sauropsids	<i>Lessner EJ, Holliday CM; University of Missouri</i>
97-11	Using diceCT to quantify in situ olfactory rosette morphology among elasmobranchs	<i>Clark AE, Meredith TL, Porter ME; Florida Atlantic University</i>
97-12	Morphology of the larval olfactory organ in the Koh Tao Island caecilian (<i>Ichthyophis kohtaoensis</i>)	<i>Patmore JM, Reiss JO; Humboldt State University</i>
97-13	An outside-in comparative study of visual systems in the <i>Drosophila melanogaster</i> subgroup	<i>Zhao A, Iyer N, Kim E, Reiser M; Janelia</i>
97-14	Eye-body allometry across biphasic ontogeny in anuran amphibians	<i>Shrimpton SJ, Streicher JW, Gower DJ, Bell RC, Fujita MK, Schott RK, Thomas KN; Natural History Museum, University College London, California Academy of Sciences, National Museum of Natural History, Smithsonian Institution, University of Texas at Arlington, York University</i>

Session 98

Skull & Jaw Functional Morphology & Evolution

Chair: Kelsey Stilson

98-1	Bird brains, jaw muscles, and the origin of avian cranial kinesis	<i>Wilken AT, Sellers KC, Cost IN, Middleton KM, Witmer LM, Holliday CM; University of Chicago, University of Missouri, Albright College, Ohio University</i>
98-2	How woodpeckers manage to retract their beak quickly after it got stuck in wood	<i>Van Wassenbergh S, Pauly E, Abourachid A; University of Antwerp, Muséum National D'Histoire Naturelle</i>
98-3	Under pressure: the relationship between cranial shape and in vivo maximal burrowing force in caecilians (<i>Gymnophiona</i>)	<i>Lowie A, Herrel A, De Kegel B, Wilkinson M, Measey GJ, O'Reilly JC, Kley N, Gaucher P, Brecko J, Kleinteich T, Adriaens D; Ghent University, MNHN, NHM, Stellenbosch University, Ohio University, Stony Brook University, CNRS, RBINS, Kiel University</i>
98-4	Morphological adaptations of the skull and teeth in kingsnakes (<i>Serpentes: Colubridae</i>) for skink predation	<i>Zobek CM, D'Amore D, Dillman CB; Cornell University, Daemen College</i>
98-5	Morphological variation of cranial elements in the western massasauga (<i>Sistrurus tergeminus</i>)	<i>Jacisin JJ, Fielder C, Hibbitts TJ, Ryberg WA, Walkup DK, Meik JM, Lawing AM; Texas A&M University, Tarleton State University</i>
98-7	Theoretical functional morphology reveals morphological evolution of the first jaws tracks a Pareto optimal front	<i>Deakin WJ, Anderson PSL, den Boer W, Hill JJ, Rücklin M, Donoghue PCJ, Rayfield EJ; University of Bristol, University of Illinois Urbana-Champaign, Swedish Museum of Natural History, Smithsonian Institution, Naturalis Biodiversity Center</i>
98-8	Myology of the Reptilia	<i>Holliday CM, Wilken AT, Sullivan SP, Sellers KC, Cost IN, Middleton KM; University of Missouri, University of Chicago, Albright College</i>
98-9	Skull shape, muscle orientation, and joint loading in a biomechanical transformation: Evolution of the suchian skull	<i>Sellers KC, Clark JM, Middleton KM, Holliday CA; University of Missouri, George Washington University</i>
98-10	Finite element modeling the effect of symphyseal tissue properties and the intramandibular joint on <i>Tyrannosaurus rex</i> mandibular biomechanics	<i>Fortner JD, Wilken AT, Sellers KC, Cost IN, Holliday CM; University of Missouri - Columbia, University of Chicago, Albright College</i>
98-11	Cranial shape variation in minks: Separating two highly similar species	<i>Gálvez-López E, Cox PG; University of York</i>
98-12	Reticulated pythons roll their hemimandibles and splay their quadrates to engulf enormous prey	<i>Capano JG, Kaczmarek EB, Lomax JJ, Turner ML, Brainerd EL, Ryerson WG; Brown University, Saint Anselm College</i>

Session 99

Social Behavior I

Chair: Erica Westerman

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| 99-1 | Indirect genetic effects on social network structure: An extended-extended phenotype | <i>Wice EW, Saltz JB; Rice University</i> |
| 99-2 | Neurogenomics of the bonding brain | <i>Tripp JA, Berrio A, McGraw LA, Matz M, Davis J, Thomas J, Young LJ, Phelps SM; University of Texas-Austin, Duke University, Emory University, CDC, NIH</i> |
| 99-3 | Sexually dimorphic gene expression associated with sexually dimorphic learning in <i>Bicyclus anynana</i> butterflies | <i>Westerman EL, Agcaoili GA, Ernst DA; University of Arkansas Fayetteville</i> |
| 99-4 | Social networks of the Atacamen Pacific iguana, <i>Microlophus atacamensis</i> | <i>Staley C, Utsumi K; Colorado State University, University of Kansas</i> |
| 99-5 | Effects of social information and social sampling methods on environmental assessments | <i>Aguiñaga J, Gomulkiewicz R, Watts HE; Washington State University</i> |
| 99-6 | Assessing behavioral and reproductive plasticity in a social orchid bee | <i>Saleh NW, Henske J, Ramirez S; University of California Davis, Ruhr University Bochum</i> |
| 99-7 | Mechanisms of life history tradeoffs in a socially flexible bee | <i>Hunter FK, Kapheim KM; Utah State University</i> |
| 99-8 | The effects of unfamiliar male odor during squeak playback on male mouse vocalizations | <i>Brunner LR, Hurley LM; Indiana University</i> |

Session 100

Social Behavior II

Chair: David Murphy

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| 100-1 | Status resolution: Behavioral differences across two social contexts in bluebanded gobies | <i>White KJ, Pradhan DS; Idaho State University</i> |
| 100-2 | Female social status, morphology and endocrinology in a hermaphroditic fish | <i>Wade KL, Pradhan DS, Grober MS; Idaho State University, Georgia State University</i> |
| 100-3 | Consistency of behavioral phenotypes and underlying physiology | <i>Cavigelli SA, McMahon EK, Farhan S; Pennsylvania State University</i> |
| 100-4 | Initiation of sex change to male in socially subordinate mangrove rivulus hermaphrodites | <i>Quertermous HM, Earley RL; University of Alabama</i> |
| 100-5 | Do female social networks influence timing of egg-laying in European starlings? | <i>Leonard KM, Williams TD; Simon Fraser University</i> |
| 100-6 | Alpha female baboons have the lowest glucocorticoid levels: What we can learn from comparing rank metrics | <i>Levy EJ, Gesquiere LR, McLean E, Franz M, Warutere JK, Sayialel SN, Mututua RS, Wango TL, Oudu VK, Altmann J, Archie EA, Alberts SC; Duke University, Oxford College of Emory University, Freie Universitaet Berlin, Amboseli Baboon Research Project, University of Nairobi, Princeton University, University of Notre Dame</i> |
| 100-7 | The collective response of antarctic krill schools to various laboratory flow conditions | <i>Murphy D, Garayev K, Mee T; University of South Florida</i> |
| 100-8 | The transgenerational effects of personally-acquired and socially-acquired predation cues in three-spined sticklebacks (<i>Gasterosteus aculeatus</i>) | <i>Afseth C, Hellmann J, Anderson S, Shim A, Bell A; University of Illinois at Urbana-Champaign, University of Dayton</i> |

Session 101

Species Distributions in the Anthropocene

Chair: Natalie Hamilton

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|--------------|--|---|
| 101-1 | Passerine feather molt extent is affected by temporal and spatial variation of climate | <i>Kiat Y, Sapir N; University of Haifa</i> |
| 101-2 | Observations of ecological discordance at Bering Strait during a marine heat wave | <i>Douglas HD; Grambling State University</i> |
| 101-3 | Modeling the response of California coastal sage scrub to over a century of climate change | <i>Knight QK, Viteri M, Hill A, Hadly E; Spelman College, Stanford University</i> |

Contributed Talks

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| 101-4 | Predicting range shifts under future climate conditions in threatened species using the Townsend's big-eared bat, <i>Corynorhinus townsendii townsendii</i> (Cooper, 1837), as an example organism | Hamilton NM, Pence A, Morrison ML; Texas A&M University |
| 101-5 | What drives range size variation: Effects of morphology on range size in the Musteloidea | Slibeck BB; Columbia University |
| 101-6 | Ground truthing microclimate models: Can we use large-scale macroclimate to predict temperatures organisms experience in the soil? | Garzella CS, Dillon ME; University of Wyoming |
| 101-7 | Climate warming expected to alter thermal performance and trigger range shift in outbreaking South American locusts | Youngblood JP, Cease AJ, Talal S, Angilletta MJ, Copa F, Medina H, Rojas J, Trumper E, Harrison JF; Arizona State University, Universidad Autónoma Gabriel René Moreno, SENASA, SENAVE, Instituto Nacional de Tecnología Agropecuaria |
| 101-8 | Latitudinal pattern in microevolution rates of thermal tolerance of marine organisms | Ye M, Collin R, Chan KYK; Swarthmore College, Smithsonian Tropical Research Institute |
| 101-9 | Are populations of the salamander <i>Bolitoglossa altamazonica</i> declining at low elevations due to rising temperatures? | Medina-Baez OA, Aponte-Gutiérrez AF, Veselka AJ, Watling JI; John Carroll University, Universidad Nacional de Colombia |

Session 102

Spines & Sutures

Chair: AL Camp

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| 102-1 | Vertebral column bending and intervertebral space shape in fishes | Abu-Bader L, Summers AP, Kruppert S, Donatelli CM; College of William and Mary, University of Washington Friday Harbor Laboratories |
| 102-2 | From head to tail, embryo to adult: the life cycle of the notochord of Atlantic salmon, <i>Salmo salar</i> | Long JH, Eilertsen M, Fjelldal PG, Helvik JV, Karlsen T, Nordvik K, Rusten I, Støren E, Totland GK, Wiig H, Kryvi H; Vassar College, University of Bergen, Institute of Marine Research |
| 102-3 | Rainbow trout use 3D vertebral flexion during suction feeding | Camp AL; University of Liverpool |
| 102-4 | Range-of-motion in dorsal vertebra of ancient tetrapods | Carter AM, Johnson EH, Hsieh S-T, Dodson P; University of Pennsylvania, Cornell University, Temple University |
| 102-5 | Analysing form and function of the cervicothoracic transition in cetartiodactyls confirms the 'functional elongation hypothesis' of the giraffe neck | Nyakatura JA, Müller MA, Merten L, Böhmer C; Humboldt Universität zu Berlin, Muséum National d'Histoire Naturelle |
| 102-6 | Sutural structure in a telescoped skull: the maxillo-frontal suture in <i>Tursiops truncatus</i> | Roston RA, Mirando AJ, McLellan WA, Pabst DA, Hilton MJ, Roth VL; University of Washington, Duke University, UNC Wilmington |
| 102-8 | Finite-element modeling of fossil taxa: how close is close enough? Sensitivity analyses on the skull of <i>Megapnosaurus</i> | Button DJ, Porro LB, Barrett PM; Natural History Museum, University College London |
| 102-9 | A bone of contention – The search for wormians in squamates | Laver RJ, Hunziker J, Bauer AM, Daza JD; Australian National University, Sam Houston State University, Villanova University |

Session 103

Structure-Function of Habitat Transitions

Chair: H Dutel

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| 103-1 | Ancestral state reconstruction of amphibious species within the order cyprinodontiformes | Bagby MW, Ross MA, Giammona F; Wake Forest University |
| 103-2 | Do environmental gradients elicit behavioural gradients in an amphibious fish | Lutek K, Foster KL, Znotinas KR, Standen EM; University of Ottawa, Ball State University, Department of Fisheries and Oceans Canada |
| 103-3 | Functional evolution of the skull during the fish-tetrapod transition: insight from living vertebrates | Dutel H, Porro LB, Fabre A-C, Martin-Silverstone E, Berks H, Fagan MJ, Rayfield EJ; University of Bristol, University College London, Natural History Museum, University of Hull |
| 103-4 | Building a tetrapod: skull topology across the water-to-land transition | Rawson JRG, Esteve-Altava B, Porro LB, Dutel H, Rayfield EJ; University of Bristol, Pompeu Fabra University, University College London |
| 103-5 | Kinematic comparisons between mudskipper fins and salamander limbs during terrestrial locomotion | Quigley ZM, Blob RW, Kawano SM; George Washington University, Clemson University |

Contributed Talks

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| 103-6 | Changes in sternohyoid contraction pattern with terrestrialization in the axolotl | <i>Rizwan M, Spence M, Rull M, Konow N, Albert A, Panessiti C; University of Massachusetts Lowell</i> |
| 103-7 | Tongue in cheek: altered basihyal kinematics during food processing in terrestrializing Axolotls | <i>Spence M, Rizwan M, Rull M, Konow N; University of Massachusetts Lowell</i> |
| 103-8 | Tongue kinematics change across terrestrialization in ambystomatid salamanders | <i>Rull M, Bouvier C, Konow N; UMass Lowell</i> |
| 103-9 | Choose your own adventure: Performance and kinematics of multiple climbing and swimming strategies in lizards | <i>Cheu AY, Bergmann PJ; Clark University</i> |
| 103-10 | Hydrodynamics of a biomechanical compliant lower limb with skeletal skin: A numerical study | <i>Huang J, Wang T, Liang J, Yang X; Beihang University, Massachusetts Institute of Technology</i> |

Session 104

Suckling, Swallowing & Chewing

Chair: Francois Gould

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| 104-1 | Hyoid movements are correlated with contractile patterns of the hyoid musculature during infant feeding | <i>Mayerl CJ, Steer KE, Chava AM, Bond LE, Edmonds CE, Gould FDH, Stricklen BM, Hieronymous TL, Vinyard CJ, German RZ; NEOMED, Rowan School of Osteopathic Medicine</i> |
| 104-2 | Heterogeneity of variance partitioning between kinematics and electromyography (EMG) of swallowing following nerve lesion in pigs | <i>Gould FDH, Lammers AR, Mayerl CM, German RZ; Rowan School of Osteopathic Medicine, Cleveland State University, NEOMED</i> |
| 104-3 | Capsaicin improves swallow safety during infant feeding | <i>Edmonds CE, German RZ, Gould FDH, Steer KE, Adjerid K, Bond LE, Mayerl CJ; Northeast Ohio Medical University, Rowan School of Osteopathic Medicine</i> |
| 104-4 | Time-shifting correlations in jaw-tongue coordination during feeding in pigs | <i>Montuelle SJ, Olson R, Gerstner G, Curtis H, Williams SH; Ohio University Heritage College of Osteopathic Medicine, Center for Research and Interdisciplinarity Paris, University of Michigan School of Dentistry</i> |
| 104-5 | Sucking and lapping in mammals: a false dichotomy? | <i>Olson RA, Montuelle SJ, Curtis H, Williams SH; Ohio University, Ohio University Heritage College of Osteopathic Medicine</i> |
| 104-6 | The effect of oral anesthesia on jaw and tongue kinematics during feeding in Macaca mulatta | <i>Laurence-Chasen JD, Arce-McShane FI, Hatsopoulos NG, Ross CF; University of Chicago</i> |
| 104-7 | The role of inferior alveolar nerve afferents in control of jaw kinematics in Didelphis virginiana | <i>Stilson KT, Li P, Laurence-Chasen JD, Olson S, Luo Z, Ross CF; University of Chicago</i> |
| 104-8 | How do different feeding delivery parameters affect swallowing behavior in infant pigs? | <i>Adjerid K, Mayerl CJ, Gould FDH, Edmonds CE, Steer KE, Bond LE, German RZ; Northeast Ohio Medical University, Rowan University School of Medicine</i> |
| 104-9 | Does sensation within the oral cavity determine occlusal movement and duration? | <i>Beery SM, Chubb E, Olson R, Montuelle SJ, Curtis H, Williams SH; Ohio University</i> |

Session 105

Swimming: Maneuvering & Stability

Chair: Freddie Ortiz

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| 105-1 | Maneuverability of hatchling Sepia officinalis | <i>Ganley A, Bartol I; Old Dominion University</i> |
| 105-2 | The contribution of the body, pectoral fins and ribbon fin to turning in a gymnotiform swimmer | <i>Hawkins OH, Ortega-Jimenez V, Sanford C; Kennesaw State University</i> |
| 105-3 | Pectoral fin kinematics and electromyography in Karman gaiting trout | <i>Gibbs BJ, Akanyeti O, Liao JC; University of Florida, Whitney Lab for Marine Bioscience, Aberystwyth University</i> |
| 105-4 | Center of mass and center of buoyancy dynamics in the bluegill (Lepomis macrochirus) | <i>Fath M, Polavaram T, Donahue J, Nguyen S, Tytell E; Tufts University, Boston College</i> |
| 105-5 | Flight of Daedalus: Kinematics of demersal swimming in the fish superfamily Cottoidea | <i>Ortiz FD, Buser T, Hall K, Kolmann M, Donatelli C; Denison University, Oregon State University, University of Washington, Friday Harbor Labs, University of Michigan, University of Ottawa</i> |
| 105-6 | Modeling nonlinearities of refuge tracking in Eigenmannia virescens | <i>Yang Y, Wilkinson MG, Whitcomb LL, Cowan NJ; Johns Hopkins University</i> |

Contributed Talks

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| 105-7 | Fin kinematics during acceleration and turning in fishes: using a novel method to regularly produce irregular behaviors | <i>Clark AD, Tytell ED; Tufts University</i> |
| 105-8 | Flooded forests in flow; trout exploit wakes behind multi-cylinder arrays | <i>Liao JC, Rajeev E, Canestrelli A, Ray B; University of Florida Gainesville</i> |
| 105-9 | Hydrodynamics of a biomechanical compliant flipper with skeletal skins: A numerical study | <i>Huang J, Wang T, Yang X, Liang J; Beihang University, Technical University of Munich, Massachusetts Institute of Technology</i> |
| 105-10 | Locomotor costs of a fibrosis based immune response in sticklebacks | <i>Matthews DG, Maciejewski MF, Wong G, Lauder GV, Bolnick DI; Harvard University, University of Connecticut, University of Illinois Urbana-Champaign</i> |
| 105-11 | Tuna robotics: using machine learning and inertial measurement sensors for sensory feedback during swimming | <i>Chen W, Zhu J, Stankovic J, Lauder GV, Bart-Smith H; University of Virginia, Harvard University</i> |

Session 106

Symbiosis and Immunity

Chair: Hanny Rivera

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| 106-1 | Identifying Candidate PPOs in Corals: Is the melanin synthesis cascade more similar to humans or insects? | <i>Van Buren EW, Ponce IE, Mydlarz LD; University of Texas at Arlington</i> |
| 106-2 | Differential regulation of innate immunity between symbiotic states in a facultative coral | <i>Rivera HE, Williams LM, Gilmore TD, Davies SW; Boston University</i> |
| 106-3 | Ecological simulation of baseline immunity indicates potential disease susceptibility in <i>Astrangia poculata</i> | <i>Harman TE, Strychar KB, Barshis DJ, Hamsher SE, Hauff-Salas B; Grand Valley State University, Old Dominion University, Grand Valley State University, Our Lady of the Lake University</i> |
| 106-4 | The freshwater sponge, <i>Ephydatia muelleri</i> , and its chlorophyte symbiont: a model to understand intracellular symbiosis | <i>Hill AH, Hall C, Camilli S, Dwaah H, Kornegay B, Lacy CA, Hill M; Bates College, University of Virginia, Princeton University, Tufts University, University of Richmond</i> |
| 106-5 | Characterizing symbiosis-specific proteins in a cnidarian-dinoflagellate symbiosis using aptamer Cell-SELEX | <i>Maruyama S, Weis VM; Oregon State University</i> |
| 106-6 | Comparative genomics reveals differences between coral-associated and free-living bacteria | <i>Pac JM, Maranto D, Medina M, Kerwin AH; McDaniel College, Pennsylvania State University</i> |

Session 107

Temperature and Metabolism

Chair: Andrea Rummel

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| 107-1 | Thermal plasticity in a combustion impaired dragonfly phenotype | <i>Stupski SD, Schilder RJ; Pennsylvania State University</i> |
| 107-2 | Costs of averting diapause associated with slow decline of metabolic rates at low temperature in the apple maggot fly <i>Rhagoletis pomonella</i> | <i>Toxopeus J, Gadey L, Andaloori L, Sanaei M, Ragland GJ; St. Francis Xavier University, University of Colorado Denver</i> |
| 107-3 | Metabolic rate of two co-existing Ursidae species: Asiatic black bears and sun bears | <i>David ZA, Owen MA, Durrant B, Choun V, Officer K, Griego M, Whiteman J; Old Dominion University, Institute for Conservation Research, San Diego Zoo Global, Free the Bears Cambodia, University of Massachusetts-Amherst</i> |
| 107-4 | Liver proteome responses to hibernation and body temperature variability in a basoendothermic mammal | <i>Khudyakov J, Treat M, Shanafelt M, Deyarmin J, van Breukelen F; University of the Pacific, University of Nevada Las Vegas, National Institutes of Standards and Technology</i> |
| 107-5 | Not all endotherms are homeotherms: the importance of high-quality, accurate thermoregulatory datasets | <i>Breit AM, Levesque DL; University of Maine</i> |
| 107-6 | Dehydrations suppresses digestion-induced thermophyly in Children's pythons, <i>Antaresia childreni</i> | <i>Azzolini JL, DeNardo DF; Arizona State University</i> |
| 107-7 | Physiological adaptation to local temperature differences among bat wing muscles | <i>Rummel AD, Swartz SM, Marsh RL; Brown University</i> |
| 107-8 | Interactive effects of air temperature and density on flight physiology of honey bees | <i>Glass JR, Harrison JF; Arizona State University</i> |
| 107-9 | Temperature, nutrition and life history among New Zealand stick insects | <i>Cubillos CA, Augustine KE, Sinclair BJ, Buckley TR; University of Auckland, Landcare Research, Western University</i> |

Contributed Talks

- 107-10** Comparison of temperature preference and metabolic thermal sensitivity between two juvenile coastal shark species
Skelton ZR, Wegner NC, Prinzing TS, Hastings PA; University of California San Diego, National Oceanic and Atmospheric Administration, Simon Fraser University
- 107-11** The biophysical basis of thermal tolerance in fish eggs
Martin BM, Dudley PN, Kashef NS, Stafford DM, Reeder WJ, Tonina D, Del Rio AM, Foott JS, Danner EM; University of Amsterdam, UC Santa Cruz, University of Idaho, UC Davis, USFW, NOAA

Session 108

Thermobiology

Chair: Melissa May

- 108-1** Tissue-specific regulation of diapause in the Asian longhorned beetle, *Anoplophora glabripennis*
Torson AS, Roe AD, Doucet D, Sinclair BJ; University of Western Ontario, Natural Resources Canada
- 108-2** Rapid gain and slow loss of heat tolerance in *Mytilus californianus* reflects an adaptive response to timing of heat stress events in the field
Moyen NE, Crane RL, Somero GN, Denny MW; Stanford University
- 108-3** Proteomic signatures of California mussels acclimated to varying emersion temperatures and algal rations
May MA, Todgham AE, Tomanek L; Florida Gulf Coast University, University of California, Davis, California Polytechnic University
- 108-4** Testing for trans-generational effects of high temperature exposure in *Manduca sexta*
Alston MA, Kingsolver JG, Willett CS; University of North Carolina at Chapel Hill
- 108-5** Computer assisted analysis to improve throughput and precision of knockdown time assays
Perez-Galvez FR, Awde D, McCabe EA, Teets NM; University of Kentucky
- 108-6** A simple and dynamic thermal gradient device for measuring thermal performance in small ectotherms
Ritchie MW, Dawson JW, MacMillan HA; Carleton University
- 108-7** Ability of RCH to protect against physiological damage from sublethal chilling in *Drosophila melanogaster*
Unfried LN, Teets NM; University of Kentucky
- 108-8** Sensitivity of tardigrades (*Hypsibius exemplaris*) to ecologically relevant cold
Lyons AM, Roberts KT, Byassee P, Williams CM; University of California Berkeley
- 108-9** Ice-binding proteins and freeze tolerance in the bay mussel (*Mytilus trossulus*)
Box ICH, Marshall KE; University of British Columbia
- 108-10** Invaders sourced from islands: thermal matching, potential or plasticity?
Claunch NM, Goodman CM, Reed RN, Romagosa CM, Taylor EN; University of Florida, University of South Florida, United States Geological Survey, California Polytechnic State University
- 108-11** Genetic variation in phenotypic plasticity of thermal limits in *Drosophila melanogaster*
Awde DN, Teets NM; University of Kentucky

Session 109

Thermoregulation

Chair: Danielle Levesque

- 109-1** Thermoregulatory properties of bank voles affected by age and artificial selection
Grosiak M, Koteja P, Bauchinger U, Sadowska ET; Jagiellonian University, Institute of Environmental Sciences
- 109-2** Age-related differences in core body temperature and oxidative stress under limited food availability
Zagkle E, Grosiak M, Bauchinger U, Sadowska ET; Jagiellonian University
- 109-3** Delayed spring conditions force Arctic snow buntings to maintain winter thermogenic capacity while breeding
Le Pogam A, Drolet J, Young K G, Régimbald L, Roy G, Robitaille F, Laplante M-P, Berteaux D, Tam A, McRae C, Love OP, Vézina F; Université du Québec à Rimouski, University of Western Ontario, Department of National Defence, University of Windsor
- 109-4** Thermoregulatory phenotypes in mammals: the missing link between basal metabolism and life history?
Levesque DL; University of Maine
- 109-5** Ruby-throated hummingbirds (*Archilochus colubris*) abandon an energy emergency torpor strategy when they fatten for migration in late summer
Eberts ER, Guglielmo CG, Welch KC; University of Toronto at Scarborough, University of Western Ontario
- 109-6** Physiological and behavioral flexibility in heat budget-management during hovering in hummingbirds
Powers DR, Lapsansky AB, Tobalske BW; George Fox University, University of Montana
- 109-7** Development of thermoregulatory capability in Weddell seal pups
Pearson LE, Weitzner EL, Tomanek L, Liwanag HEM; California Polytechnic State University

Session 110

(Un)Correlated Evolution

Chair: Leigha Lynch

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| 110-1 | Climbing behavior and skeletal anatomy of the salt marsh harvest mouse | <i>Woldt K, Sustaita D, Pratt RB; California State University</i> |
| 110-2 | On the coevolution of mammae number and litter size | <i>Stewart TA, Yoo I, Upham NS; University of Chicago, Arizona State University</i> |
| 110-3 | Evolutionary analysis of SARS-CoV-2: Is haplotype variation linked to mortality? | <i>Fraser CJ, Butler MA; University of Hawai'i at Manoa</i> |
| 110-4 | Environmental factors shaping visible and near-infrared light manipulation in Christmas beetles | <i>Ospina-Rozo L, Stuart-Fox D; University of Melbourne</i> |
| 110-5 | Carnivoran relative brain volume does not correlate with environmental and dietary variation | <i>Lynch LM, Allen KL; Midwestern University Glendale, Washington University in St. Louis School of Medicine</i> |
| 110-6 | Tight evolutionary rate correlations between mammalian mitochondrial- and nuclear-encoded aerobic respiration proteins | <i>Weaver RJ, Havird JC; University of Texas at Austin</i> |
| 110-7 | The odd un-couple: Hypoxia tolerance uncorrelated with acid tolerance in populations of <i>Tigriopus californicus</i> | <i>Deconinck AD, Willett CS; University of North Carolina at Chapel Hill</i> |
| 110-8 | A mouthful of fry and eggs: does mouth-brooding influence head and body shape evolution in cichlid fishes? | <i>Gross D, Davoll ME, Freehill D, Nelligan N, Benton B, Larouche O, Loganathan A, Weller HI, Williams K, Price SA; Clemson University, Rice University, Brown University</i> |
| 110-9 | Shared acoustic allometry in the largest and smallest known birds | <i>Eliason CM, Riede T, Laverde-R O, Goller F, Clarke JA; Field Museum of Natural History, Midwestern University, Pontificia Universidad Javeriana, University of Utah, University of Texas Austin</i> |
| 110-10 | Evolution of fruit scent in neotropical pepper plants: a test of the dispersal syndrome hypothesis | <i>Santana SE, Kaliszewska ZA, Leiser-Miller LB, Lauterbur ME, Arbour JH, Davalos LM, Riffell JA; University of Washington, University of Arizona, Middle Tennessee State University, State University of New York at Stony Brook</i> |
| 110-11 | The nocturnal letter-winged kite (<i>Elanus scriptus</i>) and diurnal birds of prey: visual anatomy differences are not like night and day | <i>Keirnan AR, Weisbecker V, Iwaniuk AN; Flinders University, University Lethbridge</i> |

Session 111

Vertebrate Evo-Devo

Chair: Matt Rockman

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| 111-1 | Defining regulators of endochondral growth in cichlid skull evolution | <i>Johnson SL, Heubel BP, Bredesen CA, Long A, Schilling TF, Le Pabic P*; University of North Carolina Wilmington, University of Delaware, University of California Irvine</i> |
| 111-2 | Placode induction and patterning cues in the embryonic chicken scleral ossicle system | <i>Giffin JL, Franz-Odenaal TA; Mount Saint Vincent University</i> |
| 111-3 | The evolutionary change of morphogenesis of dinosaur-type femoral head | <i>Egawa S, Bishop PJ, Pintore R, Griffin CT, Tsai HP, Botelho JF, Smith-Paredes D, Kuratani S, Norell MA, Nesbitt SJ, Hutchinson JR, Bhullar BAS; Yale Peabody Museum, RIKEN BDR, Royal Veterinary College, Virginia Tech, Missouri State University, Yale Peabody Museum, Pontificia Universidad Católica, American Museum of Natural History</i> |
| 111-4 | Influence of brain-skull interactions in the evolution of the amphibian skull | <i>MacKenzie EM, McKinnell I, Maddin H; Carleton University</i> |
| 111-5 | Pharmaceutical inhibition of BMP signaling pathway severely disrupts cartilage morphology during zebrafish larval development | <i>Zinck NW, Jeradi S, Franz-Odenaal TA; Dalhousie University, Mount Saint Vincent University</i> |
| 111-6 | The many faces of evolution: heterochronic developmental mechanisms for adaptive radiations | <i>Abzhanov A; Imperial College London</i> |
| 111-7 | Odyssey of strange fish: Investigating 'ancient fish' genomes and development to illuminate vertebrate evolution | <i>Braasch I, Spotted Gar Genome Consortium, Bowfin Genome Consortium; Michigan State University</i> |

Contributed Posters

All contributed talks and posters for SICB 2021 were pre-recorded and uploaded the SICB Pathable platform. They are available “on demand” to registered attendees from Jan 3-Feb 28.

Poster 1	DCE Best Student Paper: Lynn Riddiford Award
Poster 2	DEE Best Student Paper: Huey Award
Poster 3	DNNSB Best Student Paper
Poster 4	DVM Best Student Paper: Karel F. Liem Award
Poster 5	Adaptation: Physiology, Morphology and Behavior
Poster 6	Animal Communication
Poster 7	Biomaterials, Adhesion, Sensing, and Internal Flows
Poster 8	Character Evolution and Development
Poster 9	Comparative Genomics and Proteomics
Poster 10	Comparative Morphology
Poster 11	Complementary to S5: An Evolutionary Tail: Evo-devo, Structure, and Function of Post-anal Appendages
Poster 12	Dental and Cranial Biomechanics
Poster 13	Development and Evolution
Poster 14	Education
Poster 15	Endocrinology 1
Poster 16	Endocrinology 2
Poster 17	Evolutionary Developmental Genetics
Poster 18	Evolutionary Ecology
Poster 19	Evolutionary Morphology
Poster 20	Evolutionary Physiology
Poster 21	Feeding Biomechanics
Poster 22	Foraging Behavior
Poster 23	Global Climate Change and Land-Use Change
Poster 24	Hosts, Pathogens, and Parasites
Poster 25	Hot and Cold
Poster 26	Human Impacts on Behavior
Poster 27	Immunity and Immune-based Trade-offs
Poster 28	Macroevolution, Cladistics and Phylogenetics
Poster 29	Metabolism and Physiology I
Poster 30	Metabolism and Physiology II
Poster 31	Microbiome
Poster 32	Movement, Migration and Dispersal
Poster 33	Musculoskeletal Biomechanics and Robotics
Poster 34	Neurobiology and Sensory Biology
Poster 35	Parental and Reproductive Biology
Poster 36	Sensory Biology
Poster 37	Social Behavior
Poster 38	Species Diversity and Distribution
Poster 39	Species Interactions
Poster 40	Swimming and Flying
Poster 41	Terrestrial Locomotion

Contributed Posters

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

Poster 1

DCE Best Student Paper: Lynn Riddiford Award

Chair: Kathleen Hunt

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| P1-1 | Examination of c-fos activity in the brain of male red-sided garter snakes following exposure to the female pheromone | Kaley S, Krohmer RW; Saint Xavier University |
| P1-2 | The Crustacean juvenile hormone: Characterization of the methyl farnesoate signaling genes in the <i>Gecarcinus lateralis</i> Y-organ transcriptome | Bentley VL, Mykles DL; Colorado State University |
| P1-3 | Avian stress hormones along an elevation gradient in west Texas | Martinez V, Grace JK; Texas A&M University |
| P1-4 | Validation of waterborne corticosterone measurement in juvenile leopard frog: Dos and don'ts | McClelland SJ, Woodley SK; Moravian College, Duquesne University |
| P1-5 | Mathematical modeling of growth in insects | Shao HS, Suzuki Y; Wellesley College |
| P1-6 | Seasonal distribution of arginine vasotocin in the forebrain of male red-sided garter snakes | Sweis J, Krohmer RW; Saint Xavier University |
| P1-7 | Multi-year progesterone profiles during pregnancy in baleen of humpback whales (<i>Megaptera novaeangliae</i>) | Lowe CL, Hunt KE, Rogers MC, Robbins J, Neilson J, Gabriele C, Teerlink S, Seton R, Buck CL; Northern Arizona University, George Mason University, Smithsonian-Mason School of Conservation, Alaska Fisheries Science Center Auke Bay Laboratories, NOAA Fisheries, Center for Coastal Studies, Glacier Bay National Park, Protected Resources Division, National Oceanographic and Atmospheric Administration, College of the Atlantic |

Poster 2

DEE Best Student Paper: Huey Award

Chair: Cameron Ghalambor

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| P2-1 | Impacts of <i>Egria menziesii</i> , a foundational alga, on intertidal communities in S. California and N. Washington | Zuelow AN, Burnaford JL; California State University |
| P2-2 | Finding the right home: Depth as a driver of speciation in the genus <i>Sebastes</i> | Olivares-Zambrano D, Aguilar A, Hyde J; California State University Los Angeles, NOAA Southwest Fisheries Science Center |
| P2-3 | Interactive effects of ecologically relevant temperature regimes and <i>p,p'</i> -DDE exposure on patterns of gonadal gene expression in the American alligator (<i>Alligator mississippiensis</i>) | Moore J, Bock S, Bertucci E, Bae J, Parrott B; Benedict College, University of Georgia, Augusta University |

Poster 3

DNNSB Best Student Paper

Chair: Michael Baltzley

- | | | |
|-------------|--|---|
| P3-1 | A locust visual neuron responds to object trajectory changes in the vertical plane | Santa Rita ZS, Gray JR; University of Saskatchewan |
| P3-2 | Motor output in hawk moths is encoded at the millisecond-scale across all muscles | Niebur T, Putney J, Sponberg S; Georgia Institute of Technology |
| P3-3 | Hypothalamic POMC neural modulation of infant vocalization in mice | Bosque Ortiz GM, Leao D, Dietrich MO; Yale University, Federal University of Rio Grande do Sul Porto Alegre |
| P3-4 | The effects of levetiracetam on glutamatergic synaptic transmission: crayfish and <i>Drosophila</i> NMJs | McCubbin S, de Castro NS, Cooper RL; University of Kentucky, Lafayette Senior High School |
| P3-5 | A nerve roadmap to the bluegill spiny dorsal fin | Rodriguez C, Sayegh N, Chamanlal A, Maia A; Rhode Island College |
| P3-6 | A systems change framework for evaluating academic equity and inclusion in an ecology and evolution graduate program | Wallace KJ, York JM; University of Texas at Austin |

Poster 4

DVM Best Student Paper: Karel F. Liem Award

Chair: Rick Blob

- | | | |
|-------------|---|--|
| P4-1 | Sensing in bat wings: A comparative analysis of sensory hair density in bat wing membranes | Sierra MM, Rummel AD, Kobayashi T, Swartz SM; Brown University |
| P4-2 | Stuck on you: How pelvic girdle morphology influences adhesion | Palecek-McClung AM, Huie JM, Cohen KE, Donatelli CM, Summers AP; Clemson University, George Washington University, University of Washington, Friday Harbor, WA, University of Ottawa |
| P4-3 | The versatile skulls of herbivorous fishes: the functional morphology of pacu and piranhas jaws and teeth | Poulin E, MacLeod L, Kolmann MA; University of Washington, University of Michigan |
| P4-4 | Predicting primate hip function based on bony morphology using path analysis | Aguilar LK, Collins CE, Hammond AS; American Museum of Natural History, Harvard University, Sacramento State University, New York Consortium of Evolutionary Primatology (NYCEP) |
| P4-5 | Smaller, smaller, and smaller | Heide OA, Perez CA, Herrera-Martínez A, Thomas R, Daza JD; Sam Houston State University, University of Missouri, University of Puerto Rico |

Poster 5

Adaptation: Physiology, Morphology and Behavior

Chair: Frances Bonier

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|--------------|--|---|
| P5-1 | The effects of multiple environmental factors on the hatching and emergence success of loggerhead sea turtles (<i>Caretta caretta</i>) | Gravelle JM, Wyneken J; Florida Atlantic University |
| P5-2 | Redesigning the quantification of reptile behavior in Y-mazes | Nazarian LA, Bukovich IMG, Parker MR; James Madison University |
| P5-3 | Skin lipids in Burmese pythons: comparison of data analysis approaches to multidimensional data | Lincoln JM, Bukovich IMG, Rucker HR, Baedke PE, Bartoszek I, Parker MR; James Madison University, Conservancy of Southwest Florida |
| P5-4 | Lower heart rates for ribbed mussels in exposed areas of a salt marsh at Tybee Island, Georgia | Erber JE, George SB; Georgia Southern University |
| P5-5 | Temperature changes during oogenesis impact the offspring size of a tropical slipper limpet | Ly SH, Collin R; Northeastern University, Smithsonian Tropical Research Institute |
| P5-6 | Energy use during the development of two species of Antarctic sea spider | Toh MWA, Lobert GT, Moran AL; University of Hawai'i at Mānoa |
| P5-7 | Experimental evaluation of <i>Abarenicola pacifica</i> burrowing behavior: implication for <i>Zostera marina</i> restoration and expansion success using seeds | Crow RS, Dethier M, Wyllie-Echeverria S; University of Virginia, Friday Harbor Laboratories, University of Washington |
| P5-9 | Temperature and oxygen tolerance limits of an aquatic insect depend strongly on water flow | Frakes JL, Birrell JH, Shah AA, Woods HA; University Montana |
| P5-10 | Does basal cold tolerance constrain plasticity in individual <i>Drosophila</i> ? | O'Neill EA, Davis HE, MacMillan HA; Carleton University |
| P5-11 | Does a prolonged exposure to low pH water and low food quality affect juvenile Dungeness crab behavior? | Hayes HG, Street E, Manos SA, Thompson N, Schram JB, Galloway AWE; University of Oregon, Oregon Institute of Marine Biology, North Bend High School |
| P5-12 | Hatching delays in extreme salinities in the intertidal copepod <i>Tigriopus californicus</i> | Bock AK, Burton RS; University of California San Diego |

Poster 6

Animal Communication

Chair: Tina Barbasch

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|-------------|---|---|
| P6-1 | Song variation and diversity in grasshopper sparrows of the Caribbean | Warfield J, Dalal A, Hill R, Kaiser SA, Lohr B; University of Maryland Baltimore County, Cornell University |
| P6-2 | Grasshopper sparrow warble song: Syllable classification and quantification | Hill RA, Lohr B; University of Maryland Baltimore County |

Contributed Posters

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|-------------|---|---|
| P6-3 | Dominance rank, age, and parasitism predict male vervet monkey (<i>Chlorocebus pygerythrus</i>) genital skin colouration | <i>Snyder KP, Greenberg D, Mastromonaco G, Schoof VAM; York University, McGill University, Toronto Zoo, York University</i> |
| P6-4 | Association of cap plumage color, cap size, and physiological traits in White-breasted Nuthatches (<i>Sitta carolinensis</i>) | <i>Artime LE, Wilcoxon TE; Millikin University</i> |
| P6-5 | Modeling evolution of firefly-like signal vocabularies during species radiation | <i>Nguyen C, Huang I, Peleg O; University of Colorado Boulder, Santa Fe Institute</i> |
| P6-6 | Unique fluorochrome increases social attraction in crested auklets (<i>Aethia cristatella</i>) and reveals a link to ecology | <i>Douglas HD, Ermakov I, Gellermann W; University of Alaska Fairbanks, Grambling State University, University of Utah</i> |

Poster 7

Biomaterials, Adhesion, Sensing, and Internal Flows

Chair: Lindsay Waldrop

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|--------------|---|---|
| P7-1 | Flexible armor: overlap and microstructure of poacher (Agonidae) armor | <i>Brainard CR, Summers D, Cohen KE, Kruppert S, Summers AP, Kolmann MA; UMBC, Harvard University, University of Washington, University of Michigan</i> |
| P7-2 | Are spider egg sacs extra hydrophobic? | <i>Karkosiak KQ, Coonfield AJ, Ediriweera CU, Maksuta DD, Blackledge TA; University of Akron</i> |
| P7-3 | Body and armor stiffness of the spearnose poacher <i>Agonopsis vulsa</i> (Actinopterygii; Agonidae) | <i>Jackson BJ, Naughton L, Donatelli C, Porter M, Summers A, Kruppert S; Idaho State University, Bucknell University, Friday Harbor Laboratories, Florida Atlantic University, University of Washington</i> |
| P7-4 | Anisotropic structural and mechanical properties of shark skin | <i>Hagood ME, Porter ME; Florida Atlantic University</i> |
| P7-5 | Mineral architecture in cartilaginous shark vertebrae | <i>Knaub J, Heerdegen I, Ruddy B, Ingle D, Porter ME; Florida Atlantic University, Texas A&M University Galveston</i> |
| P7-6 | Circulatory resistivity increases costs of circulatory transport in peristaltic systems | <i>Kim B, Orlovic I, Yee R, He Y, Waldrop LD; Chapman University, University of North Texas</i> |
| P7-7 | Sex-specific variation in the structure and mechanical properties of shark skin | <i>Alexander JRS, Hagood ME, Porter ME; Florida Atlantic University</i> |
| P7-8 | A histological study of the blue-dashed rockskipper (<i>Blenniella periophthalmus</i>) | <i>Buo C, Garner AM, Londrville RL; University of Akron</i> |
| P7-9 | Geometric morphometrics of climbing kinematics in waterfall climbing goby fishes | <i>Griner JG, Palecek AM, Diamond KM, Schoenfuss HL, Blob RW; Clemson University, Seattle Children's Research Institute, St. Cloud State University</i> |
| P7-10 | Odor capture by hair arrays in multiple configurations | <i>Yang S, Dao A, Nyugen-Phuoc K, He Y, Waldrop LD; Chapman University, University of North Texas</i> |
| P7-11 | Efficient localization of weakly electric fish with an electrode array | <i>Bhat A, Madhav M, Jayakumar R, Cowan N, Fortune E; Carnegie Mellon University, Johns Hopkins University, New Jersey Institute of Technology</i> |

Poster 8

Character Evolution and Development

Chair: Mackenzie Gerring

- | | | |
|-------------|--|--|
| P8-1 | Light it up! Cuticular fluorescence in arachnids may be more common than previously thought | <i>Hochberg R, Le A, Mendez L, Shelley S, Laudier D; University of Massachusetts Lowell, Laudier Histology, NY</i> |
| P8-2 | Phenotypic impacts of warming environments: Morphological differentiation in a Death Valley pupfish parallels plastic developmental response to high temperature | <i>Cleveland CS, Del Core AA, Lema SC; Cal Poly San Luis Obispo</i> |
| P8-4 | Proteomic and developmental studies of aplacophoran sclerites to study the origins of molluscan mineralized structures | <i>Yap-Chiongco MK, Kocot KM; University of Alabama, Alabama Museum of Natural History</i> |
| P8-5 | Cephalopod photophores: Estimating the origins of complex convergent traits | <i>Vincent BA, Lau ES, Ramamurthy SV, Oakley TH; University of California Santa Barbara</i> |
| P8-6 | Classification of unknown deep-sea snailfishes through morphological and genetic evidence | <i>Woodworth B, Fregosi L, Suplicz S, Palmeri J, Gerring ME; State University of New York at Genesee</i> |

Poster 9

Comparative Genomics and Proteomics

Chair: *Robery Haney*

- | | | |
|--------------|--|---|
| P9-1 | Chromosome-level assemblies of the hard clam and its parasite QPX | <i>Farhat S, Tanguy A, Allam B; Stony Brook University, Sorbonne Université</i> |
| P9-2 | Genomic and transcriptomic data define a diverse assemblage of small cysteine-rich proteins in the common house spider genome | <i>Haney RA, Abedini Z, Haney EB, Garb JE; Ball State University, St. Lawrence University, University of Massachusetts Lowell</i> |
| P9-3 | A comparative study on transposable elements in the genus aurelia | <i>Zhang P, Rozbu M, Jacobs D; University of California Los Angeles, Asian University for Women</i> |
| P9-4 | Identification of histone post-translational modifications in three tissues of Mozambique tilapia (<i>Oreochromis mossambicus</i>) | <i>Mojica EA, Fu Y, Kültz D; University of California Davis</i> |
| P9-6 | A modified CRISPR system for transcriptional activation of tilapia endogenous genes | <i>Kim C, Kültz D; University of California Davis</i> |
| P9-7 | Characterizing the genetic origin of novelty in a charismatic non-model system: bioluminescent ostracods ('sea fireflies') | <i>Mesrop LM, Goodheart JA, Minsky G, Oakley TH; University of California Santa Barbara, University of California San Diego</i> |
| P9-8 | A tale of four toadfishes: Using a comparative genomics approach to investigate phenotypic evolution in the Batrachoididae | <i>Lau ES, Varney RM, Oakley TH; University of California Santa Barbara, University of Alabama</i> |
| P9-9 | A phylogenetic analysis of the tempo and mode of cell type evolution | <i>Mah JL, Dunn CW; Yale University</i> |
| P9-10 | Temperature effects on metabolic enzymes from Antarctic and sub-tropical marine bryozoans | <i>Seman B, Ryan JF, Santagata S; Long Island University, University of Florida</i> |
| P9-11 | Dosage balance of the crested gecko (<i>Correlophus ciliatus</i>) ZZ/ZW sex chromosomes | <i>Keating SE, Pinto B, Gamble T; Marquette University</i> |

Poster 10

Comparative Morphology

Chair: *Kelly Diamond*

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|---------------|--|--|
| P10-1 | Anatomy of the hyoid musculature in the snow leopard (<i>Panthera uncia</i>) | <i>Assar S, Durhman M, Townsend KEB, Echols MS; Midwestern University, Scarlet Imaging</i> |
| P10-2 | Barb density measures often compound barb density and barb angle | <i>Dolkas GA, Wimberger PH; University of Puget Sound</i> |
| P10-4 | Maternal influence on offspring body size in the alfalfa leafcutting bee, <i>Megachile rotundata</i> | <i>Bowsher JH, Wilson ES, Rinehart J, Murphy CE, Wong C, Grula CC, Rinehart JP; North Dakota State University, University of California Davis, USDA-ARS</i> |
| P10-5 | Reproductive trade-offs in the Soapberry Bug <i>Jadera haematoloma</i> (Herrich-Schäffer, 1847) (Insecta: Hemiptera: Rhopalidae) | <i>Guruvadoo AR, Miller CW, Forthman M; University of Florida, California Department of Food and Agriculture</i> |
| P10-6 | New morphometric and structural descriptions of the Florida manatee spermatozoon | <i>Cowart JR, Collins DM, Stanton D, Larkin IV; University of Florida, University of Florida Institute of Food and Agricultural Sciences, Citrus Research and Education Center</i> |
| P10-7 | Biology-guided neural networks (BGNN) for discovering phenotypic traits | <i>Bart H, Greenberg J, Karpatne A, Mabee P, Maga AM*; Tulane, Drexel, Virginia Tech, Battelle, Seattle Children's Research Institute</i> |
| P10-8 | Machine learning-based segmentation and landmarking of 2D fish images | <i>Diamond KM, Avants BB, Maga AM; Seattle Children's Research Institute, University of Pennsylvania</i> |
| P10-9 | Geometric morphometrics of the goatfishes (Mullidae) to explore ecomorphological patterns | <i>Lungstrom LL, Nash CM, Westneat MW; University of Chicago</i> |
| P10-10 | (Almost) the same at any size: Scaling of the axial skeleton in herons (Ardeidae) | <i>Moore AJ; Stony Brook University</i> |
| P10-11 | Comparative biogeography and geometric morphometrics of the balistoid fishes | <i>Kang KJ, Nash CM, George AB, Westneat MW; University of Chicago, Field Museum of Natural History</i> |

Poster 11

Complementary to S5: An Evolutionary Tail: Evo-devo, Structure, and Function of Post-anal Appendages

Chair: *Janneke Schwaner*

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|--------------|--|--|
| P11-1 | Functional anatomy of tail regeneration in the California alligator lizard, <i>Elgaria multicarinata</i> | <i>Campos CB, Correa MG, Collins CE; California State University</i> |
| P11-2 | Self-righting in squirrels during unexpected falls – towards the crucial function of bushy tails in arboreal mammals | <i>Fukushima T, Siddall R, Byrnes G, Nyakatura J, Toussaint S, Jusufi A; Max Planck Institute for Intelligent Systems, Siena College, Humboldt Universität zu Berlin</i> |
| P11-3 | Tail length in fox squirrels (<i>Sciurus niger</i>) at Saint Mary's College | <i>Smith SK, Young VKH; Saint Mary's College</i> |
| P11-4 | Modeling flight dynamics in gliding lizards | <i>Clark JV, Clark CM; Stanford University, Harvey Mudd College</i> |
| P11-5 | Anatomical correlates of climbing behavior in <i>Peromyscus</i> | <i>Lissner J N, Press L, Meier P T; Muhlenberg College</i> |
| P11-6 | A tale of two tails: Developmental evolution of a key innovation in the fish caudal region | <i>Fitch OE, Thompson AW, Braasch I; Michigan State University</i> |
| P11-7 | Induced antiangiogenesis diminishes vascularity in regenerating axolotl tails but does not limit early tail regrowth | <i>Bollinger L, Dickie R; Towson University</i> |
| P11-8 | Effects of Insulin-like Growth Factors (IGF1 and IGF2) on brown anole lizard tail regeneration | <i>Lindsey AG, Beatty AE, Schwartz TS; Auburn University</i> |

Poster 12

Dental and Cranial Biomechanics

Chair: *Stacy Farina*

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|---------------|--|---|
| P12-1 | How important is modeling tooth enamel in FEA comparisons of whole skulls? Comparing common simplifications with biologically realistic models | <i>Herbst EC, Bastiaans D, Miedema F, Scheyer TM, Lautenschlager S; University of Zurich, State Museum of Natural History Stuttgart, University of Birmingham</i> |
| P12-3 | Comparison of grasping and biting forces among rodent species in the Suisun Marsh, California | <i>Calderon JA, Sustaita D; California State University San Marcos</i> |
| P12-4 | The quantitative analysis of coronal suture separation due to cranial trauma | <i>Baker SA, Lewis PJ; Sam Houston State University</i> |
| P12-5 | Comparing apples to oranges: Tooth performance of frugivorous piranhas and pacus (Serrasalminidae) | <i>Dawkins CD, Kruppert SK, Donatelli CD, Crofts SC, Kolmann MAK; Cornell University</i> |
| P12-6 | From pellets to palates: harder foods make hardier heads among post-weaning rats | <i>Mitchell DR, Menegaz RA; University of North Texas Health Science Center</i> |
| P12-7 | Tiny teeth in mega filter-feeders - vestigial or functional? | <i>Teeple JB, Paig-Tran EWM; California State University Fullerton</i> |
| P12-8 | The role of cranial mechanical linkages in gill ventilation of dorso-ventrally and laterally compressed fishes | <i>Stephens S, Gabriel AN, Kaczmarek E, Brainerd EL, Olsen A, Hernandez LP, Camp A, Farina SC; Howard University, Brown University, George Washington University, University of Liverpool</i> |
| P12-9 | Ventilatory shunting and its relationship to urohyal shape in flatfishes | <i>Simmons MJ, Elcock J, Evans K, Farina SC; Howard University, University of Washington, Rice University</i> |
| P12-10 | Ventilatory pressures generated by gill chambers of the chimaera <i>Hydrolagus coliei</i> | <i>Kamau-Weng J, Farina S; Northeastern University, Howard University</i> |

Poster 13

Development and Evolution

Chair: *Kathy Gillen*

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|--------------|--|---|
| P13-1 | Epigenetics and the evolution of form | <i>DeLorenzo L, Powder KE; Clemson University</i> |
| P13-2 | Using laboratory culture of the nudibranch <i>Berghia stephanieae</i> to study reproductive development and feeding behavior | <i>Taraporevala N, Goodheart J, Masterson P, Johnston H, Babonis L, Lyons D; University of California San Diego, Cornell University</i> |
| P13-4 | Craniofacial sexual dimorphism in cichlids is species-specific and occurs during development | <i>Brandon AA, Martin KT, Powder KE; Clemson University</i> |
| P13-5 | Masters of versatility: Placode development in an emerging experimental model, the chicken scleral ossicle system | <i>Drake PM, Franz-Odenaal TA; Dalhousie University, Mount Saint Vincent University</i> |

Contributed Posters

P13-6	A three-dimensional interactive embryological atlas of <i>Anolis sagrei</i> based on micro-CT	<i>Arnaoudoff LA, Sanger TS; Loyola University Chicago</i>
P13-7	Regeneration in <i>Lumbriculus variegatus</i> entails differential expression of telomerase reverse transcriptase	<i>Fischer F, LaRocca-Stravalle Z, Gillen K; Kenyon College</i>
P13-8	Mouthpart scaling relationships and foraging behavior in bumblebees	<i>Lee Y, Just J, Young M, McMahon T, Gonzalez J, O'Brien DM, Angelini DR; Colby College, Harvard University</i>
P13-9	Investigating the functions of hyaluronan and chitin and their evolutionary importance across vertebrates	<i>Allen CB, Root ZD, Medeiros D; University of Colorado Boulder</i>
P13-10	Functional analysis of endothelin ligand genes in the development of the zebrafish neural crest cell population	<i>Bennett CE, Braasch I; Michigan State University</i>
P13-11	Effects of astakine and serotonin on adult neurogenesis	<i>Baldwin SC, Benton JL, Beltz BS; Wellesley College</i>

Poster 14

Education

Chair: Tyson Hedrick

P14-1	Evaluating automated image analysis for pinniped assessments	<i>Das N, Josephson B, Murray K; Stockton University, National Oceanic and Atmospheric Administration</i>
P14-2	Increasing diversity through community college student engagement: A student run organization model	<i>Robin AN, Lessig E, Frausto C; University of California Los Angeles , University of Texas at Austin</i>
P14-4	2D and 3D video digitizing with a web browser	<i>Byrd MA, Hedrick TL*; University of North Carolina at Chapel Hill</i>
P14-5	Introducing undergraduates to their first research experience using a virtual format	<i>Stover KK, Hanna JB, Benson MA, Liu T, Pankey CL; WVSOM</i>
P14-6	"Hormones & Society" in Endocrinology: Bringing social justice issues into a STEM classroom	<i>Lynn SE, Benowitz-Fredericks ZM; College of Wooster, Bucknell University</i>
P14-7	Project Field Equity (Fe): A three-pronged approach to preventing SVSH and maximizing inclusivity in biological fieldwork	<i>Lyons AM, Tribble CM, Beal D, Wefferling K, Wrensford K, Lee J, Pak N, Williams CW; University of California Berkeley</i>
P14-8	Teaching a hands on, interactive course remotely in a socially distanced world	<i>Biondi AA, Flammang BE; New Jersey Institute of Technology</i>

Poster 15

Endocrinology 1

Chair: Tessa Solomon-Lane

P15-1	Examining neophobia and startle behavior in response to nutritional stress during development	<i>Musulman AM, Coutts VM, Wada H; Auburn University</i>
P15-2	Cortisol level of redbfin shiners (<i>Notropis umbratilus</i>) varies among riparian areas with different land use practices	<i>Vignos AM, Wilcoxon TE; Millikin University</i>
P15-3	Differential gene expression of anti-damage regulators at the upper limit of the thermoneutral zone in zebra finches	<i>Coutts VM, Beatty A, Schwartz T, Cooper C, Hurley L, Griffith S, Wada H; Auburn University, Macquarie University</i>
P15-4	Hyperosmolality induces nuclear translocation of osmotic stress transcription factor 1 in <i>Oreochromis mossambicus</i> cells	<i>MacNiven L, Hamar J, Kültz D; University of California Davis</i>
P15-5	Carbohydrate breakdown reflects wear-and-tear during a combined fast and chronic stress in house sparrows (<i>Passer domesticus</i>)	<i>Beattie UK, Ysrael MC, Romero LM; Tufts University</i>
P15-6	Examining the effects of conventional and organic agriculture on capacity to cope in larval grey treefrogs (<i>Hyla versicolor</i>)	<i>Bryant AR, Gabor CR; Texas State University</i>
P15-7	The plasticity of social status: systemic stress hormones in a hermaphroditic fish	<i>Rivas MG, White KJ, Pradhan DS; Idaho State University</i>
P15-8	Rapid effects of acute stress on reproductive neuroendocrinology and gonad function in the big brown bat (<i>Eptesicus fuscus</i>)	<i>Alonge MM, Greville LJ, Ma X, Faure PA, Bentley GE; University of California, McMaster University</i>

Poster 16

Endocrinology 2

Chair: Brian Walker

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|--------------|--|---|
| P16-1 | Modulation of extra-pineal melatonin in response to an immune challenge with LPS in <i>Rhinella icterica</i> toads | Cyrino JC, Figueiredo AC, Gomes FR, Titon SCM*; University of Sao Paulo |
| P16-2 | Stress in a dynamic environment: How a cold water fish might cope with climate change | Wooding AP, Kline BC, Christensen KR, Keeley ER, Pradhan DS; Idaho State University |
| P16-3 | rainfall and puberty status predict energy balance in Amboseli baboons | Young GK, Gesquiere L, Alberts SC; Duke University |
| P16-4 | Stress axis correlates of juvenile social behavior and group structure in a highly social fish | Cantelon CL, Kwun C, Harmon IP, McCabe EA, Solomon-Lane TK; , Pitzer, Scripps, and Claremont McKenna Colleges |
| P16-5 | Stuck in a bucket: The effect of confinement stress on cortisol levels in brook trout (<i>Salvelinus fontinalis</i>) | Christensen KR, Wooding AP, Whitworth R, Rivas MG, Pradhan DS; Idaho State University |
| P16-6 | Prolonged fasting increases DNA methylation in northern elephant seal pups | Gibson EF, Torres-Velarde JM, Crocker DE, Vazquez-Medina JP; University of California Berkeley, Sonoma State University |
| P16-7 | Immune and hormonal regulation in the postprandial period of Bullfrogs (<i>Lithobates catesbeianus</i>) | Figueiredo AC, Titon SCM, Cyrino JC, Nogueira LAK, Gomes FR; University of São Paulo, Universidade Federal de São Paulo |

Poster 17

Evolutionary Developmental Genetics

Chair: Karen Crawford

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|---------------|--|---|
| P17-1 | Species-specific roles of Sox10 in the neural crest gene regulatory network | Camacho-Avila AC, Rogers CD; California State University Northridge, UC Davis School of Veterinary Medicine |
| P17-2 | Cis-regulatory control of stage-specific notochord gene expression by Brachyury | Negron-Pineiro LJ, Di Gregorio A; New York University College of Dentistry |
| P17-3 | Brachyury evolution and expression in the moon jellyfish <i>Aurelia</i> | Xu S, Zhang P, Jacobs DK; University of California Los Angeles |
| P17-4 | Investigating the roles of the canonical Wnt and Notch signaling pathways in establishment of the tardigrade anteroposterior axis | Chavarria RA, Smith FW; University of North Florida |
| P17-5 | Investigating the mechanism by which the class IV POU transcription factor regulates the maturation of distinct mechanoreceptor cell types in Cnidaria | Apulu NJ; University of Arkansas |
| P17-6 | Filling in the gaps: Fibroblast growth factor 10 induced intercalary regeneration in salamanders | Gibson MG, Crawford K; St. Mary's College of Maryland |
| P17-7 | Thirty-five genes found upregulated in <i>Berghia stephanieae</i> distal cerata | Bigasin AR, Goodheart JA, Lyons DC; University of California San Diego |
| P17-8 | Hedgehog signaling pathway in penaeid shrimp: Developmental expression and evolution of splice junctions | Hertzler PL, DeBoer RA; Central Michigan University |
| P17-9 | Deciphering the origin of metamorphosis through epigenetics | Tan MT, Chen T, Suzuki Y; Wellesley College |
| P17-10 | Evolution of hatching gland and hatching enzymes in annual killifishes | Wojtas H, Davoll M, Braasch I, Thompson AW; Michigan State University, Clemson University |
| P17-11 | Conserved and divergent aspects of leg development in Tardigrada | Game M, Smith FW; University of North Florida |
| P17-12 | Tendon development in lamprey and its implications for vertebrate morphological evolution | Brewer ME, Root ZR, Medeiros DM; University of Colorado Boulder |

Poster 18

Evolutionary Ecology

Chair: Nick Barts

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|--------------|---|---|
| P18-1 | Effect of lay order and breeding site on eggshell maculation and egg size in barn swallows (<i>Hirundo rustica erythrogaster</i>) | Beech ARF, Berejka BW, Smith EB, Liu Y, Tsunekage T, Levin II; Kenyon College, Agnes Scott College |
| P18-2 | Sensory transcriptomes across variable environments | Gomez A, Wang X, Rodriguez-Santiago M, Boughman JW, Hofmann HA, Ålund M, Young RL; UT Austin, Michigan State University |

Contributed Posters

- P18-3** A case of convergence: evolution of a digestive lysozyme in herbivorous rodents
Barts N, Toner C, Meyer W, Kohl K; University of Pittsburgh, Lehigh University
- P18-4** Land use conversion affects life-history traits of western mosquitofish
Gabor CR, Aspbury AS, Chester SM; Texas State University
- P18-5** Not that hot after all: no limits to heat dissipation in lactating mice selected for high or low BMR
Sadowska J, Gębczyński AK, Lewoc M, Konarzewski M; University of Białystok
- P18-6** The evolution of startle displays: a case study in praying mantises
Vidal-García M, O'Hanlon JC, Svenson JG, Umbers KDL; Australian National University, University of Calgary, University of New England, Cleveland Museum of Natural History, Western Sydney University
- P18-7** Is pollution driving evolution: Killifish adaptability
Kenwood MR, Fuchs ME; Ursinus College
- P18-8** An ecological investigation of cancer in a prostate cancer cell model
Paravasthuresh A, Neiman M, Stipp C, Pope A; University of Iowa, Humboldt State University

Poster 19

Evolutionary Morphology

Chair: Anthony Lapsanky

- P19-1** How to tuna fish: Drivers of diversity in Pelagiaria (tunas, mackerels and their kin)
Knapp A, Rangel G, Johanson Z, Giles S, Friedman M, Goswami A; Natural History Museum, University of Birmingham, University of Michigan
- P19-2** Re-thinking modes of teleost tooth replacement using the dentally diverse combtooth blennies (Blenniidae)
Williams KL, Hundt PJ, Keogh SM, Simons AM; Clemson University, University of Minnesota
- P19-3** Comparative biogeography and geometric morphometrics of the balistoid fishes
Kang KJ, Nash CM, George AB, Westneat MW; University of Chicago, Field Museum of Natural History
- P19-4** Ontogenetic development of the holocephalan dentition: Morphological transitions of dentine in the absence of teeth
Johanson Z, Manzanares E, Underwood C, Clark B, Fernandez V, Smith MM; Natural History Museum London, University of Valencia, Birkbeck University London, King's College London
- P19-5** Untangling the diversity and evolution of tentacles in scallops, oysters, and their relatives (Bivalvia: Pteriomorpha)
Audino JAA, Serb JM, Marian JEA; Iowa State University, University of São Paulo
- P19-6** Big female heads and big male bodies: sexual dimorphism in skeletal shape in voles
Morris JS, Rogers N, Rogers AR, Carrier DR; Wofford College, University of Utah
- P19-7** Osteological differences among populations of the Puerto Rico bush anole (*Anolis pulchellus*)
Doucet DS, Herrera-Martínez A, Campbell TL, Daza JD; Sam Houston State University, Texas Invasive Species Institute, Baylor University
- P19-8** Quantifying evolutionary bias from character covariation: simulation-based approach for (evolutionary) covariance matrices
Watanabe J; University of Cambridge
- P19-9** Do multifunctional locomotor demands constrain the evolution of the avian wing?
Lapsanky AB, Szabo I, Tobalske BW; University of Montana, University of British Columbia
- P19-10** How mandible morphology relates to trophic ecology in Antarctic amphipods : the case of Iphimediidae revealed by 3D-Geometric Morphometrics and Stable Isotopes.
Verheyne M.L., Herrel A, Frédéric B, Castrec C, Michel L, Lepoint G; MNHN, Uliège, Université de Bretagne Occidentale, Ifremer

Poster 20

Evolutionary Physiology

Chair: James Harper

- P20-1** A remarkably consistent life history trait with a remarkably inconsistent developmental basis: lack of evolutionary conservation of transcriptomic trajectories during tephritid fly diapause
Gadey L, Dowle EJ, Powell TH, Nguyen A, Papadopoulos NT, Hahn DA, Ragland GJ; University of Colorado Denver, University of Otago, Binghamton University, University of Florida, University of Thessaly
- P20-2** Rate of living theory re-visited: mitochondrial, cellular, and whole-organism metabolism in Siberian hamster and the long-lived Damaraland mole rat
Yap KN, Wong HS, Ramanathan C, Rodriguez-Wagner CA, Freeman DA, Zhang Y; Auburn University, Calico Life Sciences LLC, University of Memphis

Contributed Posters

P20-3	A spectrum of sleep, shallow torpor, and deep torpor in hummingbirds	<i>Shankar A, Cisneros INH, Thompson S, Graham CH, Powers DR; Cornell University, Stony Brook University, George Fox University, Swiss Federal Research Institute WSL</i>
P20-4	Food availability alters stress resistance in speckled cockroaches (<i>Nauphoeta cinerea</i>)	<i>Abril JT, Gaviria MA, Harper JM; Sam Houston State University</i>
P20-5	Size matters: body size is correlated with longevity in speckled cockroaches (<i>nauphoeta cinerea</i>)	<i>Badwan S, Harper JM; Sam Houston State University</i>
P20-6	The powerhouse of the cell has the power to influence mtDNA mutations	<i>MacLaine KD, Stebbings KA, Havird JC; University of Texas at Austin</i>
P20-7	Decline in haematocrit with increasing age in zebra finch (<i>Taeniopygia guttata</i>)	<i>Coughlan K, Sadowska ET, Bauchinger U; Jagiellonian University, Nencki Institute of Experimental Biology PAS</i>
P20-8	Uncoupling proteins as a physiological defense mechanism in <i>Drosophila</i>	<i>Sum J, Montooth KL, Matoo OB, DeWitt H; University of Nebraska-Lincoln</i>

Poster 21

Feeding Biomechanics

Chair: Jonathan Cowart

P21-1	Relationship between diet and gill raker morphology in Surfperches (Embiotocidae)	<i>Akinrinade AO, Jensen JS; University of Washington Bothell</i>
P21-2	Differences in the histological composition of piranha and pacu lips are consequences of prey manipulation tactics	<i>Cohen KE, Komann MA; Friday Harbor Labs, University of Washington, University of Michigan</i>
P21-3	Feeding upside down: Hydrodynamics of filter-feeding in flamingos	<i>Ortega-Jimenez VM, Seleb BR, Wilson LG, Mendelson JR, Bhamla S; Georgia Institute of Technology, Zoo Atlanta</i>
P21-4	Feeding currents of upside-down jellyfish: role of oral arm structure	<i>George N, Gaddam MG, Santhanakrishnan A; Oklahoma State University</i>
P21-5	Ubiquitous yet inconspicuous: quantifying trophic impact of a widespread oceanic comb jelly (Ctenophore)	<i>Potter B, Corrales-Ugalde M, Townsend JP, Colin SP, Sutherland KR, Costello JH, Gemmell BJ; University of South Florida, University of Oregon, Providence College, Roger Williams University</i>
P21-6	How to eat a boxed lunch - crabs feeding on armored poachers	<i>Trainor S, Donatelli CM, Kolmann MA, Summers AP, Summers DS*, Kruppert S; Rice University, University of Ottawa, University of Michigan, University of Washington, Friday Harbor Labs</i>
P21-7	The impact of automated milk delivery on infant feeding performance	<i>Steer KE, Edmonds CE, Gould FDH, Adjerd K, Bond LE, German RZ, Mayerl CJ; NEOMED, Rowan School of Osteopathic Medicine</i>
P21-8	Sexual dimorphism in chameleon feeding	<i>Bagana M, Danos N*; University of San Diego</i>
P21-9	Fin-triguing fish: functional equivalency of jaw morphologies of fin- and scale-feeding piranhas'	<i>MacLeod LM, Racy JM, Summers AP, Kolmann MA; University of Washington, University of Washington, Friday Harbor Labs, University of Michigan Museum of Paleontology</i>
P21-10	Experimentally decoding the forces of butterflyfish on anchored prey	<i>Romero JA, Wainwright P, Stuart H; UC Berkeley, UC Davis</i>
P21-11	Jaw morphology in <i>Poecilia reticulata</i> does not differ in high- and low- predation environments	<i>Khoriaty M, Kane E; Bowdoin College, University of Louisiana at Lafayette</i>

Poster 22

Foraging Behavior

Chair: Amanda Puitiza

P22-1	Behavioral strategies of juveniles: Attraction to adult feeding cues	<i>Kleckner K, Zlotnik S, Miller CW; University of Florida</i>
P22-2	Juveniles do not use adult feeding sites in the leaf-footed bug, <i>Narnia femorata</i>	<i>Ricker TA, Zlotnik S, Miller CW; University of Florida Gainesville</i>
P22-3	Leaf choice by salmonfly nymphs (<i>Pteronarcys californica</i>) in western Montana	<i>Hamant EL, Frakes JL, Woods HA; University Montana</i>
P22-4	Exploring predictors of problem-solving and innovation ability in captive Asian elephants	<i>Puitiza A, Jacobson S, Synder R, Sheppard A, Plotnik J; CUNY Hunter College, CUNY Graduate Center, Oklahoma City Zoo and Botanical Garden, Rosamond Gifford Zoo</i>

Contributed Posters

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|--------------|--|---|
| P22-5 | Habitat-specific foraging strategies and polymorphic variation of bluegill sunfish, <i>Lepomis macrochirus</i> | <i>Postupaka D, Le E, Svensson K, Uhm C, Ellerby DJ, Wood BM; Wellesley College</i> |
| P22-6 | Mapping spatiotemporal changes of North American beaver (<i>L. Castor canadensis</i>) trail and canal networks | <i>Chen CFZ, Kennedy JRM, Nagpal R; Harvard College, Harvard University School of Engineering and Applied Sciences (SEAS)</i> |
| P22-7 | Flight speeds of hummingbirds during foraging and territory defense | <i>Hanna R, Sustaita D, Hedrick T, Rico-Guevara A; University of Washington, California State University San Marcos, University of North Carolina</i> |

Poster 23

Global Climate Change and Land-Use Change

Chair: Isaac VanDiest

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|---------------|--|---|
| P23-1 | Assessing sublethal stress in honeybees exposed to "bee-friendly" neonicotinoid and pyrethroid pesticides | <i>Nenstiel R, Donahoe C, Hranitz JM, Surmacz C; Bloomsburg University</i> |
| P23-2 | Assessing road traffic and roadside mowing levels on pollinator habitat quality in highway roadsides | <i>Schoenfeldt A, Stack Whitney K; Rochester Institute of Technology</i> |
| P23-3 | The effects of impoundments on downstream food availability in relation to freshwater mussel growth and condition | <i>Roden JW, Bidwell JR; East Tennessee State University</i> |
| P23-4 | Effects of transient salinity stress on larval growth and development in the southern toad (<i>Anaxyrus terrestris</i>) | <i>Tutelo GA, Welch AM; College of Charleston</i> |
| P23-6 | Striped mullet die-off after heatwave in Malibu Lagoon, Los Angeles | <i>Cosca CM, Turba R, Jacobs DK; University of California Los Angeles</i> |
| P23-7 | Do octopuses change RNA editing patterns in response to ocean acidification? | <i>Sereewit A, Onthank K; Walla Walla University</i> |
| P23-8 | Elevated seasonal temperature disrupts prooxidant-antioxidant homeostasis and promotes cellular apoptosis in the american oyster, <i>Crassostrea virginica</i> : a field study | <i>Rahman MS, Rahman MS; University of Texas Rio Grande Valley</i> |
| P23-9 | Effects of urbanization on the nestling nutrition of song sparrows | <i>Vandiest IJ, Lane SJ, Sewall KB; Virginia Tech</i> |
| P23-10 | Hanging by a thread: Investigating the effect of low tide temperature on mussel attachment strength | <i>Oraha GR, Burnaford JL; California State University Fullerton</i> |
| P23-11 | Combined effects of temperature and salinity on the coral, <i>Astrangia poculata</i> | <i>Merges H, Goddard K; Ursinus College</i> |
| P23-12 | Injury from sediment mobility and recovery in two species of stream annelids | <i>Koenigsmark A L, Leinbach S E, Bely A E; University of Maryland College Park</i> |

Poster 24

Hosts, Pathogens, and Parasites

Chair: Joshua Benoit

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|--------------|---|--|
| P24-1 | The role of social interactions in iridovirus transmission among terrestrial Isopoda | <i>Eley M, Gatzke T, Eastburn M; Princeton High School, Princeton, NJ</i> |
| P24-2 | Estimation of prevalence and qPCR copy number of <i>Ophidiomyces ophiodiicola</i> and Snake Fungal Disease in a snake community in southern Illinois, with notes on detection methods | <i>Smaga CR, Allender MC, Jiménez FA; Southern Illinois University, University of Illinois</i> |
| P24-3 | Insufferable bookworms and their crabby victims: Quantifying the infection intensity of flatworms on horseshoe crab book gills | <i>Piechocki C, Liang N, O'Reilly S, Brianik C, Bopp J, Cerrato R, Allam B; Stony Brook University</i> |
| P24-4 | Interspecific competition differentially influences disease dynamics via competing mechanisms in a directly transmitted disease system | <i>Eleftheriou A, Luis AD; University of Montana Missoula</i> |
| P24-5 | Effect of temperature on behavior and contact rates in house finches | <i>Teemer SR, Hawley DM; Virginia Tech</i> |
| P24-6 | The effect of <i>Mycoplasma gallisepticum</i> infection on feather quality and maintenance in house finches (<i>Haemorhous mexicanus</i>) | <i>Alms DM, Langager MM, Weitzman CL, Hawley DM; Virginia Tech</i> |
| P24-7 | Effects of experimental malaria infection on self-maintenance behavior in house sparrows | <i>Couvillion KE, Kelly TR, Lattin CR; Louisiana State University</i> |

Poster 25

Hot and Cold

Chair: Michael Finkler

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|---------------|--|--|
| P25-1 | Do microRNAs mediate the response to cold stress in the flesh fly, <i>Sarcophaga bullata</i> ? | Reynolds JA, Bryant C; Ohio State University |
| P25-3 | Microclimate and physiological plasticity interact to determine overheating risk of competing native and invasive <i>Anolis</i> lizards | Rej J, Deery S, Gunderson A; Tulane University |
| P25-4 | Does ultraviolet light influence thermoregulation behavior in lizards? | Conley DA, Lattanzio MS; Christopher Newport University |
| P25-5 | Effects of low temperature early in incubation on embryonic growth and development in <i>Chelydra serpentina</i> : implications of a slow start | Finkler MS; Indiana University Kokomo |
| P25-6 | Temperature effect on metabolism and muscle mechanics of Narragansett fishes | Florendo JS, Hatcher M, Irving D, Maia A; University of Washington, Rhode Island College |
| P25-7 | Effect of temperature on sperm motility and longevity in <i>Anolis sagrei</i> | Wang W, Gunderson A; Tulane university |
| P25-8 | Effects of heat stress on cellular stress response in the common goldfish, <i>Carassius auratus</i> | Vazquez OA, Rahman MS; University of Texas Rio Grande Valley |
| P25-9 | Effects of elevated temperature on 8-hydroxy-2'-deoxyguanosine expression and DNA damage in the eastern oyster (<i>Crassostrea virginica</i>) | Faizur Rahman MD, Saydur Rahman MD; University of Texas Rio Grande Valley |
| P25-10 | The response of Northern flying squirrels to rising ambient temperatures | Gudde E, Levesque D; University of Maine |
| P25-11 | Heat stress and energetic components in <i>Cassiopea xamachana</i> | Maloney ME, Pomory CM; University of West Florida |
| P25-12 | Exploring the relationships among metabolic rate, movement, thermal tolerance and life-history traits across diverse populations of the freshwater crustacean <i>Daphnia magna</i> | Ulrich M, Ebert D, Stillman JH; University of Basel, San Francisco State University, University of California |
| P25-13 | Body temperature is more important than seasonality and steroid levels in determining immunity in the hibernating tegu lizard | Madelaire CB, Zena LA, Dillon D, Pereira D, Hunt K, Buck CL, Bicego KC, Gomes FR; Northern Arizona University, University of São Paulo, Sao Paulo State University |

Poster 26

Human Impacts on Behavior

Chair: Jake Lasala

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|--------------|---|---|
| P26-1 | Glyphosate and antibiotics reduce activity and affect growth in Rio Grande leopard frog (<i>Rana berlandieri</i>) tadpoles | Villatoro-Castañeda M, Forsburg ZR, Fritts SR, Gabor CR, Carlos-Shanley C; Texas State University |
| P26-2 | Investigating the impacts of temperature, photoperiod, and population density on diapause incidence in the alfalfa leafcutting bee, <i>Megachile rotundata</i> | Singh P, Brar G, Scrapper B, Floden M, Rinehart JP, Bowsher JH; North Dakota State University, USDA-ARS Fargo |
| P26-3 | Effects of urban land use on bird vocalizations | Krishnan AG, Meyers D, Long H, Foltz S; Reed College, Radford University |
| P26-4 | Environmental factors related to foraging activity in a semi-terrestrial salt marsh crab | Foltz SL, Austin A; Radford University |
| P26-5 | Are the behaviors of the domestic cat (<i>Felis catus</i>) predominantly domesticated or feral/ancestral? A hypothetical evaluation of temperament and personality traits | Kaatz IM; SUNY ESF Syracuse NY |
| P26-6 | Characterizing Coqui frogs in Phipps Conservatory and Botanical Gardens | Moore H J, Bischof K, McClelland S, Wheeler M, States S, Freeman P, Woodley S; Duquesne University, Phipps Conservatory and Botanical Gardens |

Poster 27

Immunity and Immune-based Trade-offs

Chair: Carla Madelaire

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| <p>P27-1 Testing the metabolic pace-of-life model among vertebrate immune responses</p> <p>P27-2 Ophidiomycosis, but not reproductive status, is associated with reduced post-capture glycemic response in pygmy rattlesnakes (<i>Sistrurus miliarius</i>)</p> <p>P27-3 Effects of immune challenge on immunological and endocrine parameters of Cururu toads (<i>Rhinella icterica</i>) in their natural habitat</p> <p>P27-4 Body temperature is more important than seasonality and steroid levels in determining immunity in the hibernating tegu lizard</p> <p>P27-5 Day vs. night: LPS effects on immunity and hormone mediators in toads</p> <p>P27-6 Corticosterone transdermal application impact on toads (<i>Rhinella icterica</i>) phagocytosis</p> <p>P27-7 Sickness behavior: What's T got to do with it?</p> <p>P27-8 Seasonality of West Nile virus competence in a widespread reservoir</p> <p>P27-9 Increased phagocytic capability prior to experimental malaria inoculation may reduce likelihood of infection at no cost to body condition</p> <p>P27-10 Diet macronutrient composition affects disease pathology in <i>Serinus canaria</i> infected with <i>Mycoplasma gallisepticum</i></p> <p>P27-11 Seagrass wasting disease severity in the Salish Sea</p> | <p>Weitzman CL, Salcido D, Muchoney N, Yoon S, Espeset A, Larsen E, Lindauer A, Slinn H, Voyles J, Smilanich AM; Virginia Tech, University of Nevada, University of Guelph</p> <p>McPherson SM, Agugliaro J, Farrell TM, Lind CM; University of New England, Fairleigh Dickinson University, Stetson University, Stockton University</p> <p>Garcia Neto PG, Titon SCM, Assis VR, Muxel SM, Titon Jr B, Ferreira LF, Gomes FR, Fernandes PAC; University of Sao Paulo, Santo Andre Foundation University Center</p> <p>Madelaire CB, Zena LA, Dillon D, Pereira D, Hunt KE, Bicego KC, Buck CL, Gomes FR; Northern Arizona University, São Paulo State University, University of São Paulo</p> <p>Titon SCM, Titon Jr B, Floreste FR*, Garcia Neto PG, Lima AS, Ferreira LF, Vasconcellos-Teixeira R, Gomes FR, Assis VR; University of Sao Paulo, Santo Andre Foundation University Center</p> <p>Assis VR, Titon SCM, Titon Jr B, Gomes FR; University of Sao Paulo</p> <p>Emmi A, Schuerman D, Gormally BMG, Lopes PC; Chapman University</p> <p>Koller KL, Kernbach ME, Martin LB; University of South Florida</p> <p>Stansberry KR, Kelly TR, Lattin CR; Louisiana State University</p> <p>Perrine WG, Love AC, Morris AN, DuRant SE; University of Arkansas</p> <p>Richards KM, Cline NW, Burgess EL, Brothers CJ; Walla Walla University, Burman University</p> |
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Poster 28

Macroevolution, Cladistics and Phylogenetics

Chair: Sally Chang

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| <p>P28-1 Mitochondrial introns of Porifera: Implications of a greater prevalence</p> <p>P28-2 Phylogenetic placement of two new species of New Zealand mite harvestmen based on target-capture of ultra-conserved elements (UCEs)</p> <p>P28-3 Developing a contaminant-aware pipeline to resolve lophotrochozoan relationships in the genomics age</p> <p>P28-4 Learning the "chick-a-dee" call: Implications for reproductive isolation in sympatry</p> <p>P28-5 Acoustically distinct contact calls of two subspecies of a New World warbler, <i>Setophaga coronata</i></p> <p>P28-6 Determining the biodiversity of <i>Wirenia</i> (Mollusca, Aplacophora) in the northeastern atlantic</p> <p>P28-7 A new species of bioluminescent ostracod from the reefs of Carrie Bow Caye, Belize (Ostracoda: Myodocopida: Cypridinidae)</p> <p>P28-8 Sashimi: Automatic high-throughput pipeline for organismal image segmentation using deep learning</p> | <p>Weeger A, Lavrov D; Iowa State University</p> <p>Dohr SR, Tuffield MS, Hahn KM, Ward RS, Moore CD, Shu Y, Morisawa R, Derkarabetian S, Boyer SL; Macalester College, Harvard University</p> <p>Roberts NG, Kocot KM; University of Alabama, Museum of Natural History</p> <p>Spinelli J, Huynh A, Rice A; Lehigh University</p> <p>Sharma SN, Sharma SN, Young MA, Hahn TP; Franklin High School, University of Illinois Urbana-Champaign, Cornell University, University of California Davis</p> <p>Bond CE, Kocot KM; University of Alabama Tuscaloosa</p> <p>Drummond MS, Colburn NR, Ellis EA, Gerrish GA, Oakley TH, Goodheart JA; University of California, University of Florida, Center of Limnology, West Lake Station, University of California San Diego</p> <p>Schwartz ST, Alfaro ME; University of California Los Angeles</p> |
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Contributed Posters

- P28-9** Comparative head morphology of predaceous (Staphylininae) and mycophagous (Oxyporinae) rove beetles (Staphylinidae, Coleoptera) *Spiessberger EL, Betz O; Eberhard Karls Universität Tübingen*
- P28-10** From mud to meat: Employing phylogenetics and metabarcoding gut-content analyses to test evolutionary hypotheses of trophic transitions in a group of predatory annelids *Mack JM, Martinsson S, Klinth M, Erséus C, Bely AE; University of Maryland College Park, University of Gothenburg*
- P28-11** Tell me what you eat, I'll tell you what are! A study of a hyperparasite *Cyclocotyla bellones* (Monogenea, Platyhelminthes) using integrative taxonomy *Bouguerche C, Tazerouti F, Delphine G, Justine JL; Université des Sciences et de la Technologie Houari Boumediene, Muséum National d'Histoire Naturelle*

Poster 29

Metabolism and Physiology I

Chair: Guy Charmantier

- P29-2** The role of sirtuins in linking the oxidative stress response and food ration *Tomlinson B, May MA, Tomanek L; California Polytechnic State University, Florida Gulf Coast University*
- P29-3** Does predator presence influence anaerobic metabolism and behavior in the acorn barnacle *Balanus glandula*? *Anderson KN, Dotterweich MM, Hardy KM; California Polytechnic State University, SLO*
- P29-4** The influence of different oxygen regimes on bioenergetics of a soft shell clam *Mya arenaria* *Ouillon N, Sokolov EP, Jarret A, Sokolova IM; University of Rostock, Leibniz-Institute for Baltic Research*
- P29-5** Mitochondrial capacity and reactive oxygen species production in response to short-term hypoxia and reoxygenation in the ocean quahog, *Arctica islandica* *Steffen JBM, Haider F, Sokolov EP, Sokolova IM; University of Rostock, Leibniz-Institute for Baltic Research*
- P29-6** How does CAPA inhibit fluid secretion in the female *Aedes aegypti* mosquito: cellular mechanism and signaling pathway *Sajadi F, Paluzzi JP; York University*
- P29-7** Efficient CRISPR/Cas9 gene editing in a tilapia cell line model using endogenous promoters *Hamar JC, Kültz D; University of California, Davis*
- P29-8** Occurrence of hyper-hypo osmoregulation during the post-embryonic development of the Asian shore crab *Hemigrapsus sanguineus* at an invaded site (North Sea, German Bight) *Charmantier G, Gimenez L, Torres G; University of Montpellier, Bangor University, Alfred-Wegener-Institut*
- P29-9** Sequence analysis of cation-chloride cotransporters in mosquitoes *McCabe TC, Gillen CM; Kenyon College*

Poster 30

Metabolism and Physiology II

Chair: Jane Khudyakov

- P30-1** Multi-tissue proteome responses to prolonged fasting in a capital breeding marine mammal *Khudyakov J, Holser R, Ly S, Niel T, Banerjee R, Hasan B, Nguyen KD, Tan E, Tang C, Vierra C, Costa D; University of the Pacific, University of California, Santa Cruz*
- P30-2** Effects of diffuse light on the physiology, growth, and fruit yield of tomato plants *Ellertson K, Prakash A, Goldsmith G, Berry ZC; Chapman University*
- P30-3** Does adaptation to high altitude affect hypoxia-dependent structural plasticity of the placenta? *Johnson HC, Wilsterman K, Good JM, Cheviron ZA; University of Montana*
- P30-4** Ecophysiological tradeoffs in female red-eared sliders (*Trachemys scripta*) *Terry J, Fiedor T, Veach MV, Vickrey CV, Neuman-Lee LA; Arkansas State University - Jonesboro*
- P30-5** Microplastics translocate to hemolymph and increase standard metabolic rate in the blue crab, *Callinectes sapidus* *Neurohr JM, Simpson SK, Kinsey ST; UNCW*
- P30-6** Contributions of the titin ortholog, *sallimus*, to stress strain relationships in *Drosophila* larval body wall: work loop analysis of *sls* knockdown and actomyosin interruption *Sibiskie CL, Krans JL; Western New England University*
- P30-7** Developing circadian clock reporter cell lines using a CRISPR gene editing knockin approach *Stanton DS, He H, Liu AC; University of Florida*
- P30-8** Cardiovascular function during early development is suppressed by nicotine-free, cinnamon flavored, electronic cigarette vapor *Piechowski JM, Bagatto B; University of Akron*

Poster 31

Microbiome

Chair: Ken Field

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|--------------|--|--|
| P31-1 | Characterization of prophages in the honey bee gut | Bueren EK, Weinheimer AR, Aylward FO, Hsu BB, Bradford EL, Haak DC, Belden LK; Virginia Tech |
| P31-2 | Exposing frog embryos to bacterial isolates: Colonization order impacts structure of the tadpole microbiome | Jones KR, Belden LK, Hughey MC; Virginia Tech, Vassar College |
| P31-3 | Captivity converges the microbiomes of diverse primate species | Wills M, Johnson M, Brunmeier E, Murphy T, Johnson T, Knights D, Clayton JB, Shields-Cutler RR; Macalester College, Como Zoo and Conservatory, University of Minnesota, University of Nebraska Omaha |
| P31-4 | Microhabitats influence on the anti-fungal bacteria diversity of Plethodontid salamanders | Alomar N, Farallo V, Muñoz M, Longo A; University of Florida, University of Scranton, Yale University |
| P31-6 | Phylogeny does not always rule the roost: High similarity in the fecal microbiome of obligate brood parasitic nestlings and their host nestmates | Rudski EN, Antonson ND, Louder MIM, Schelsky WM, Hauber ME, Kohl KD; University Pittsburgh, University Illinois Urbana-Champaign |
| P31-7 | The gut microbiome and host fitness: microbial links to nestling growth and survival in wild great tits | Somers S, Davidson G, Quinn J; University College Cork, University of Cambridge |
| P31-8 | Effect of toxins on host microbiomes in an echinoderm keystone species as an indicator of ecosystem health | Brocco French KI, German DP; University of California Irvine |

Poster 32

Movement, Migration and Dispersal

Chair: Clint Collins

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|--------------|--|--|
| P32-1 | How does kangaroo rat locomotion respond to changes in terrain manipulations during foraging in the field? | Collins CE, Vázquez-Domínguez E, McGowan CP; Sacramento State University, Universidad Nacional Autónoma de México, University of Southern California |
| P32-2 | Movement behavior in the sand dollar <i>Mellita tenuis</i> | Cleveland AB, Pomory CM; University of West Florida |
| P32-3 | Assessing telomeres as a potential marker of the cost of migration in red-winged blackbirds | Morales-Vega E, Eshleman MRA, Klug PE, López-Martínez G, Young R, Björn W, Greives TJ; North Dakota State University, USDA-APHIS-WS, NWRC, Institute of Environmental Change and Society |
| P32-4 | Fuel reserves or fueling en route? Scouting Trip versus Wandering Search strategies for nomadic migrants | Hahn TP, Dingle H, Ramenofsky M, Cussen VA, Watts HE, Cornelius JM; Univ of California Davis, Washington State Univ, Oregon State Univ |
| P32-5 | Achieving swarm cohesion and exploration using simple sensory feedback | Strong JBE, Akanyeti O; University of Aberystwyth |
| P32-6 | Age-related changes in the performance of female C57BL/6J mice during a battery of behavioral tests | Truesdell CA, Horton BM, Robinson KS, Hoover JE; Millersville University |

Poster 33

Musculoskeletal Biomechanics and Robotics

Chair: Jeradi Shirine

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|--------------|--|--|
| P33-1 | Filament compliance and the perturbation response of active sarcomeres | Nguyen KD, Venkadesan M; Yale University |
| P33-2 | Anatomy and muscle fiber types of kangaroo rat hindlimb muscles | Ross CD, Meyers RA; Weber State University |
| P33-3 | Evaluating the effects of whole-body vibrations (WBV) on vertebrate bone development using zebrafish larvae as a model | Jeradi S, Franz-Odenaal TA; Mount Saint Vincent University |
| P33-4 | Effect of protein origin on skeletal muscle physiological performance | Shehaj A, Rimkus B, Putra C, Konow N; University of Massachusetts Lowell |
| P33-5 | Getting a grasp on the avian tendon locking mechanism | Schwartz RM, Cost IN; Albright College |
| P33-6 | A coordinate-system-independent method for comparing joint rotational mobilities | Manafzadeh AR, Gatesy SM; Brown University |

Contributed Posters

- | | | |
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| P33-7 | XROMM Tools for DeepLabCut: Bringing deep learning to XROMM marker tracking | <i>Laurence-Chasen JD, Manafzadeh AR, Hatsopoulos NG, Ross CF, Arce-McShane FI; University of Chicago, Brown University</i> |
| P33-8 | Mole crab inspired robot and simulation models reveal limb scaling and coordination principles for legged burrowing | <i>Parikh AS, McInroe BW*, Full RJ; University of California Berkeley</i> |
| P33-9 | Morphological compliant robotic system in cluttered terrain | <i>Kabutz HD, Jayaram K; University of Colorado Boulder</i> |
| P33-10 | Viscous damping in legged locomotion | <i>Mo A, Izzi F, Haeufle DFB, Badri-Spröwitz A; MPI for Intelligent Systems, University of Tübingen</i> |
| P33-11 | The effects of muscle tissue inertia and series elasticity on the metabolic cost and efficiency of contraction | <i>Ross SA, Wakeling JM; Simon Fraser University</i> |

Poster 34

Neurobiology and Sensory Biology

Chair: James Newcomb

- | | | |
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| P34-1 | Using hybridization chain reaction for reliable, large-scale mapping of neurons in the brain of the nudibranch, <i>Berghia stephanieae</i> | <i>Ramirez MD, Tait C, Katz PS; University of Massachusetts Amherst</i> |
| P34-2 | Minimally invasive neural stimulation via ultrasound and piezoelectric nanoparticles | <i>Newcomb JM, Jordan T, Luke GP, Hoppa MB; New England College, Dartmouth College</i> |
| P34-3 | Characterizing the sialin gene family expansion in Cephalopoda: Neurogenomic insights into invertebrate intelligence | <i>Gustafson TM, Fitak RR; University of Central Florida</i> |
| P34-4 | Regeneration of autotomized cerata in <i>Berghia stephanieae</i> | <i>Thoroughgood DNF, Newcomb JM; New England College</i> |
| P34-5 | Morphological background for non-canonical action of monoamines in Porifera | <i>Sokolova AM, Voronezhskaya EE; NK Koltzov Institute of Developmental Biology</i> |
| P34-6 | Role of visual stabilization in home vector memory during path integration in fiddler crabs, <i>Uca pugnator</i> | <i>Chatterji R, Layne JE; University of Cincinnati</i> |
| P34-7 | Consistent nest site selection by turtles across sites with varying levels of human disturbance | <i>Caldwell MF, Lopez-Perez JE, Warner DA, Wolak ME; Auburn University, Eckerd College</i> |
| P34-9 | Implications of background variation on color variation within a population of Carolina grasshoppers | <i>Gilbert FR, Brandley NC; College of Wooster</i> |

Poster 35

Parental and Reproductive Biology

Chair: Cheyenne Tait

- | | | |
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| P35-2 | Male mice behavioral response to female squeak intensity | <i>McAlister SM, Hurley LM; Indiana University</i> |
| P35-3 | Female <i>Aneides aeneus</i> avoid mating with inferior males near egg deposition time | <i>Cupp PV; Eastern Kentucky University</i> |
| P35-4 | Win-stay, lose-shift and bower marauding: The time evolution of dispersion and destruction | <i>Smith JM, Potter RB, Pruett-Jones SG; University of Washington Seattle, University of California Los Angeles, University of Chicago</i> |
| P35-5 | Learning to be attractive: investigating the role of learning in the expression of complex sexual signals | <i>Spezie G, Fusani L; University of Veterinary Medicine, University of Vienna</i> |
| P35-6 | Communal egg-laying behavior and the consequences of egg aggregation in the brown anole (<i>Anolis sagrei</i>) | <i>Dees AG, Wilson K, Reali C, Preutt JE, Hall JM, Brandt R, Warner DA; Auburn University, University of Alabama at Huntsville, Science North Sudbury</i> |
| P35-7 | Population density and the reproductive hormone conopressin affect the mating behavior of the nudibranch <i>Berghia stephanieae</i> differently | <i>Tait CC, Nedeljkovic K, Olson MN, Katz PS; University of Massachusetts Amherst</i> |
| P35-8 | Are melanistic plumage characteristics a signal of mitochondria number, oxidative stress and fitness in male house sparrows? | <i>Galante H, Kittilson JD, Elderbrock EK, Heidinger BJ, Greives TJ; North Dakota State University</i> |
| P35-9 | Creepy Crawly Compensation: Examining the costs of ectoparasite-induced compensatory growth in late-stage nestlings | <i>Lusk EP, Casto JM; Illinois State University</i> |

Poster 36

Sensory Biology

Chair: James Murray

- | | |
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| <p>P36-1 Magneto-sensory orientation discrepancies across different populations of the sea slug <i>Tritonia</i> when undergoing magnetic field rotations</p> | <p><i>Jalala HM, Awad AH, Murray JA, Cain SD; California State University East Bay, Eastern Oregon University</i></p> |
| <p>P36-2 Color vision in the nymphalid butterfly, <i>Adelpha fessonia</i></p> | <p><i>Dang A, Bernard GD, Olguin AR, Macias-Muñoz A, Lawrence JP, Hill RI, Mullen SP, Briscoe AD; University of California Irvine, University of Washington Seattle, Universidad Nacional Autónoma de México, University of California Irvine, University of the Pacific, Boston University</i></p> |
| <p>P36-3 Effects of temperature on peripheral nervous system development in cartilaginous fishes</p> | <p><i>Zino RA, Peele EE, Yopak KE; University of North Carolina at Wilmington</i></p> |
| <p>P36-4 A comparative analysis of the remote touch mechanism in birds</p> | <p><i>Spriggs SN, Cost IN; Albright College</i></p> |
| <p>P36-5 The effects of chemical cues from a visually-guided predator, <i>Gambusia affinis</i>, on eye size development in <i>Daphnia</i></p> | <p><i>Williams BA, Brandon CS; Florida Southern College</i></p> |
| <p>P36-6 Could differences in color vision contribute to mate preference divergence in a polymorphic poison frog?</p> | <p><i>Howell K, Richards-Zawacki CL; University of Pittsburgh</i></p> |
| <p>P36-7 How glutamate transporter deletion influences behavior, longevity, and protein expression in <i>Caenorhabditis elegans</i></p> | <p><i>Bronstone GJ, Bauer DE, Harling M, Muldowney M, Funk AJ, Reigle J, Meller J, O'Donovan SM, McCullumsmith RE; Wellesley College, University of Toledo, University of Cincinnati</i></p> |

Poster 37

Social Behavior

Chair: Matthew Lefauve

- | | |
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| <p>P37-1 Is a social group the sum of its parts? The relationship between group structure and individual phenotype in a highly social fish</p> | <p><i>McCabe EA, Kwun C, Harmon IP, Cantelon CL, Solomon-Lane TK, Pitzer, Scripps, Claremont McKenna Colleges</i></p> |
| <p>P37-2 Quantity and quality of early-life social relationships affects behavior and neuroendocrine function in a highly social fish</p> | <p><i>Vergun MR, Weinstein J, Graves H, McCabe EA, Solomon-Lane TK; Scripps College, Claremont McKenna College, Pitzer</i></p> |
| <p>P37-3 The effects of aggression and neophobia on olfactory learning in crickets</p> | <p><i>Albers JM, Reichert M; Oklahoma State University</i></p> |
| <p>P37-4 The neural transcriptomic basis of attaining social dominance status</p> | <p><i>Wang JY, Paggeot LX, Friesen CN, Solomon-Lane TK, Hofmann HA, Young RL; University of Texas at Austin</i></p> |
| <p>P37-5 The role of ultraviolet light on mating behavior in two sand dwelling Lake Malawi cichlid fishes</p> | <p><i>Daigle KR, Webb JF, Maia A; Rhode Island College, University of Rhode Island</i></p> |
| <p>P37-6 3D-motion capture to analyse a complex courtship display</p> | <p><i>Janisch J, Quigley C, Perinot E, Fusani L; University of Veterinary Medicine, University of Vienna</i></p> |
| <p>P37-7 Is mate switching an adaptive behavior in house wrens (<i>Troglodytes aedon</i>)?</p> | <p><i>Turner AM, Reichard DG, Schultz EM, Davis KM, Meehan ME; Ohio Wesleyan University</i></p> |
| <p>P37-8 Social dynamics in bonobos: Using cortisol to measure stress response with the introduction of a new group member</p> | <p><i>Mitchell L, Tagliatela J, Guindre-Parker S; Kennesaw State University</i></p> |

Poster 38

Species Diversity and Distribution

Chair: Luciana Gusmao

- | | |
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| <p>P38-1 Bipolar distributions in sea anemones (Cnidaria: Anthozoa: Actiniaria): the case of <i>Halcampoides Danielsseni</i>, 1890</p> | <p><i>Gusmao LC, Rodríguez E; American Museum of Natural History</i></p> |
| <p>P38-2 Diversity of holoplanktonic gastropods during seasonal upwelling in the bay of Panama</p> | <p><i>De León A, Madrid M, Collin R; Smithsonian Tropical Research Institute, International Maritime University of Panama</i></p> |
| <p>P38-3 Geographic inventory of New Zealand's mite harvestmen (Arachnida, Opiliones, Cyphophthalmi)</p> | <p><i>Shu Y, Sirvid PJ, Boyer SL; Macalester College, Museum of New Zealand Te Papa Tongarewa</i></p> |
| <p>P38-4 Predicting habitat suitability for Scyphozoan jellyfish (Phylum Cnidaria) in the Gulf of Mexico</p> | <p><i>Frolova AD, Retchless D, Miglietta MP; Texas A&M University at Galveston</i></p> |

Contributed Posters

- P38-5** A modular, programmable, open-source camera trap platform *Seleb BR, Bhamla MS; Georgia Institute of Technology*
- P38-6** First insights into extinct oyster diversity *Hayer S, Ewers-Saucedo C*, Brandis D, Krause-Kyora B; Christian-Albrechts University*
- P38-7** Direct and indirect influences of climate on pollination and floral morphology *Miladin JR, Steven JC, Collar DC; Christopher Newport University*
- P38-8** Genetic diversity and connectivity of *Chasmanthium latifolium* (Poaceae) in Pennsylvania: the effect on conservation status *Hayes JD, Williams TM, McDonnell AJ, Goad RK, Schuette S, Martine CT; Bucknell University, Chicago Botanical Garden, Pennsylvania Natural Heritage Program, Western Pennsylvania Conservancy*
- P38-9** Modeling the climatic niche and geographical distribution of the desert night lizard, *Xantusia vigilis* *Furman DR, Halvorsen SK, Clark K, Adolph SC; University of Pennsylvania, Harvey Mudd College*
- P38-10** Phylogenetic analysis of Icelandic Euphrosinidae utilizing DNA barcoding *Batts E, Whitman K, Meissner K, Kevin KM; University of Alabama, German Center for Marine Biodiversity Research*

Poster 39

Species Interactions

Chair: Bob Thacker

- P39-1** Changes in the composition of honey bee (*Apis mellifera*) gut bacterial communities following disturbance by antibiotics *Gregory CL, Bradford EL, Belden LK; Virginia Tech*
- P39-2** Small mammal community dynamics in serpentine grasslands in California *Bistritz L, Viteri MC, Hadly EA; Hebrew University of Jerusalem, Stanford University*
- P39-3** Can we rapidly assess algal symbiont densities in facultatively symbiotic corals using photographic assessments? *Tramonte CA, Wuitchik DM, Aichelman HE, Davies SW; Boston University*
- P39-4** Investigating the host buffering hypothesis: How does *Breviolum psygmophilum* respond to thermal challenge in and out of symbiosis with their coral host, *Oculina arbuscula* *Huzar AK, Aichelman HE, Davies SW; Boston University*
- P39-5** Diel thermal variation supports growth and symbiosis in a reef-building coral *Aichelman HE, Benson BE, Castillo KD, Baumann JH, Rippe JP, Nieves OC, Pereslele AM, Stanizzi DA, Tsang LC, Davies SW; Boston University, University of California Davis, University of North Carolina Chapel Hill, Bowdoin College, University of Texas Austin*
- P39-6** The transcriptional response of coral-associated algal symbionts is modulated by natural environmental rhythms *Knasin L, Wuitchik D, Pilcher C, Vize PD, Davies SW; Boston University, St. Lawrence University, University of Calgary*
- P39-7** Diel thermal variability structures algal and microbial symbiont communities in the reef-building coral, *Siderastrea siderea* *Tsang LC, Aichelman HE, Benson BE, Davies SW; Boston University*
- P39-8** A conceptual framework for phenological mismatches: interspecific interactions modulate consumer-resource mismatches under environmental change *Schaefer JL, Ayers D; University of California Davis*
- P39-9** Characterizing the role of nutrient transporters in development and symbiosis establishment in *Exaiptasia diaphana* *White ER, Weis VM; Oregon State University*
- P39-10** Comparing adult and larval microbiomes in the tropical sponges *Neopetrosia sigmafera* and *Xestospongia bocatorensis* *Akther T, Easson CG, Collin R, Thacker RW*; Stony Brook University, Middle Tennessee State University, Smithsonian Tropical Research Institute, Stony Brook University*
- P39-11** Snail-fur symbionts: microscopic comparison of two species of ectosymbiotic peritrich ciliates (Ciliophora: cf. *Scyphidia* spp.) from freshwater snails *Stormer HG, Proctor HC; University of Alberta*
- P39-12** Predicting suitable habitat for the critically endangered yellow-tailed woolly monkey (*Lagothrix flavicauda*) in Peru *Zarate MA, Shanee S, Schmitt CA; Boston University, Neotropical Primate Conservation*
- P39-13** Exploring the effects of toxic red tide algae (*Karenia brevis*) on development of the marine snail *Crepidula fornicata* *Clark D, Pechenik JA, Robbat Jr. A; Tufts University*

Poster 40

Swimming and Flying

Chair: Christoffer Johansson

- | | | |
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| P40-1 | The curious case of chimaera kinematics: gait transitions in the spotted ratfish (<i>Hydrolagus coliei</i>) | <i>Mehlhorn AE, Donatelli CM, Hall KC; William and Mary, University of Ottawa,, University of Washington, Friday Harbor Labs</i> |
| P40-2 | A precise and cost-effective fish flume for assessing swimming performance in fishes | <i>Phillips QP, Karra P, Minicozzi MR; Minnesota State University</i> |
| P40-3 | Butterfly flight reveals efficient propulsive clap mechanism | <i>Johansson LC, Henningsson P; Lund University</i> |
| P40-4 | Insects go with flow: A mathematical model of induced flow and cooling during flight | <i>Meja B, Notar JC, Johnsen S; Duke University</i> |
| P40-5 | Boatmen and backswimmers and beetles, oh my: intermediate Reynolds number locomotion in aquatic insects | <i>Chantarawong N, Byron ML; Pennsylvania State University</i> |
| P40-6 | Modelling the relationship between frog morphology and swimming performance over multiple kicking cycles | <i>Richards CT, Moen DS; Royal Veterinary College, Oklahoma State University</i> |
| P40-8 | Aerodynamics of manoeuvring flight in pied flycatchers (<i>Ficedula hypoleuca</i>) | <i>Maeda M, Henningsson P*; Royal Veterinary College, Lund University</i> |
| P40-9 | Comparing the pectoral girdle and fin morphology in frogfishes | <i>Harb S, Sawicki G, Amplo HE, Flammang BE; NJIT, Cornell University, Rutgers-Newark</i> |
| P40-10 | Swimming functional morphology and performance in five ecomorphs of the direct developing Microhylidae | <i>Johnson ML, Danos N, Butler MA; University of San Diego, University of Hawaii</i> |
| P40-11 | The unusual ventral light reflexes of fairy shrimp | <i>Furgal RC, Lessios NN; Assumption University</i> |

Poster 41

Terrestrial Locomotion

Chair: Armita Manafzadeh

- | | | |
|---------------|--|---|
| P41-1 | Soft-ground gait dynamics and transitions in avian running | <i>Ashlyn A, Daley MA, Hubicki CM; FAMU-FSU College of Engineering, University of California Irvine</i> |
| P41-2 | Reinforcement learning based simulation of ostrich locomotion using a whole-body model | <i>La Barbera V, Tassa Y, Richards C, Daley M, Hutchinson J; Royal Veterinary College, DeepMind, University of California Irvine</i> |
| P41-3 | Developmental plasticity of locomotor economy in guinea fowl | <i>Johnson T, Katugam K, Dechene I, Cox SM, Piazza SJ, Rubenson J; Pennsylvania State University, University of California Irvine</i> |
| P41-4 | Developmental plasticity of walking energetics and swing-phase mechanics in chronically limb-loaded fowl | <i>Katugam K, Johnson T, Dechene I, Cox SM, Piazza SJ, Rubenson J; Pennsylvania State University</i> |
| P41-5 | Substrate compliance improves locomotor performance in the Mongolian gerbil (<i>Meriones unguiculatus</i>) | <i>Moncrieffe TE, Crandell KE; Bangor University</i> |
| P41-6 | Do ankle extensor muscles match locomotor behavior in rodents? | <i>Thomas NT, O'Brien HD, Gignac PM, McGowan CP, Collins CE; Sacramento State University, OSU Center for Health Sciences, University of Southern California</i> |
| P41-7 | The plantaris muscle substantially increases stiffness of the metatarsal phalangeal joint in kangaroo rats | <i>Di Stefano NE, McGowan CP, Lin DC; Washington State University, University of Idaho</i> |
| P41-8 | Role of hindlimb proprioceptive feedback in the coordinated landing behavior of <i>Rhinella marina</i> | <i>Duman A, Azizi E; University of California Irvine</i> |
| P41-9 | The relationship between locomotor performance and habitat use in six-lined racerunners (<i>Aspidoscelis sexlineata</i>) in coastal South Carolina | <i>Pehl K, McElroy E; College of Charleston</i> |
| P41-10 | Validation of collar-mounted inertial sensors for quantifying locomotion in sifakas (<i>Propithecus coquereli</i>) | <i>Heslep NR, Murphy AA, O'Hanlon CP, Wunderlich RE; James Madison University</i> |
| P41-11 | Landing branch reaction forces in jumping fox squirrels | <i>Lee SD, Wang LK, Stuart H, Full RJ; University of California Berkeley</i> |

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