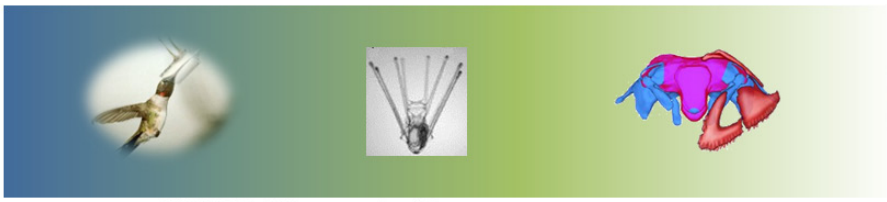
The Society for Integrative & Comparative Biology



SICB Newsletter

Spring 2015 Issue

Division of Comparative Biomechanics

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DCB Officers & Representatives

Melina Hale
Chair 2015-2017

Sheila Patek
Chair-Elect 2015-2017

Mark Denny
Past Chair 2015-2017

Andrea Ward
Secretary 2014-2016

Joseph Thompson
Program Officer 2014-2016

Nicholas Gidmark
Student/Postdoc Rep 2013-2016

Message from the Chair

*Melina Hale, **Chair.DCB@sicb.org***

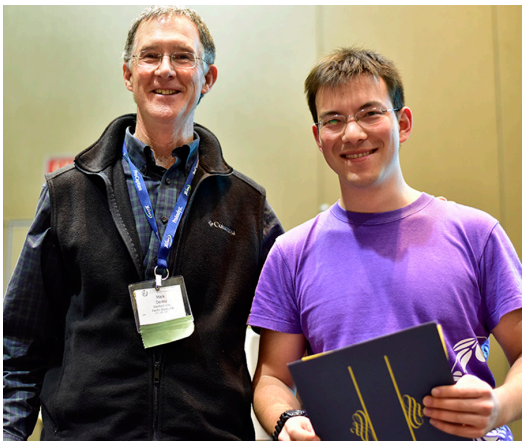
While the warm weather of West Palm Beach may have helped keep many of us going through this particularly challenging winter, the inspiring science and engaging conversations of the annual meeting are always energizing. The 2015 meeting's success was due to the efforts of many people. In the DCB, I'd particularly like to extend a big thanks to Mark Denny who just ended his term as DCB chair having led the division over the past two years. His energy and thoughtful perspective are great assets to the division. We also owe a debt of gratitude to Andie Ward and Joe Thompson whose efforts as secretary and program officer were key to making DCB events run smoothly.

Student Awards

A big change for the 2015 meeting was the format for the Best Student Paper and Poster awards. With the large number of presentations vying for the awards in previous years, it had been challenging to coordinate judging efforts and insure that all presentations receive equal consideration. For the 2015 meeting, DCB instituted a selection process, choosing a short list of presentations to compete. For the oral presentations, the finalists were showcased in one paper session. Given the packed room and exceptional quality of the talks, I imagine this will become a hallmark event of the meeting. Similarly, having the stellar poster award competitors clustered on one day brought additional excitement and attention to the poster hall. Congratulations to all of our finalists and award winners!

Student Best Poster Award:

Winner: Steve Heim. "Simplifying control through active tail use."



Steven Heim, here with Mark Denny, won the DCB student poster prize.

Finalists: Noah Bressman. Visual navigation and locomotor behaviors of Fundulus heteroclitus in a terrestrial environment."

James Crall. "Free flight through tough turbulence: bumblebee flight stability across body size, speed, and flow regime."

Kiran Girdhar. "The behavioral space and neural model of locomotion repertoire of zebrafish."

Student Best Presentation Award:

Brett Aiello, the 2015 winner of the Best Student Presentation in DCB

Winner: Brett Aiello. "Pectoral fin proprioception is tuned to fin mechanics."

Runner-up: Jorn Cheney. "Shaping the wings of bats: muscle and wing skin interactions in flight."

Jorn Cheney, runner-up for the 2015 Best Student Presentation in DCB

Finalists: Guillermo Amador. "Eyelashes divert airflow to protect the eye."

Judy Jinn. "Quadrupedal locomotion on the water's surface by geckos."

Sandy Kawano. "Mixed chains of safety factors in the limb bones of salamanders: implications for differential limb function in the evolution of terrestrial locomotion."

Benjamin Perlmann. "An odd little fish that spends time…on land!"

Amanda Stowers. "Passive wing morphing as a consequence of centrifugal acceleration in flapping wings."

As in previous years, the student presentation award process has been deftly coordinated by Jake Socha and his efforts are greatly appreciated. For students interested in competing in January 2016, the process begins at the time of abstract submission when you will submit a one-page extended abstract, in addition to the regular abstract. Finalists will be chosen early in the fall.

Named Student Presentation Awards

Another exciting change is coming to the Best Student Presentation Awards in 2016. After a year of discussion and voting by the DCB membership, the Division has named its student awards, honoring several of our esteemed colleagues.

<u>The Steven Vogel Award for the Best Student Poster in biomechanics.</u>
This award will be named for Steve Vogel, James B. Duke Professor, Emeritus, in the Department of Biology at Duke University. Steve's work includes foundational research in biomechanics with a focus in fluid dynamics and he has impacted many through his engaging teaching and mentoring. In addition, Steve has introduced the world to our field through his rigorous, accessible and always punny books on all things biomechanics. May we aspire for our posters to be as engaging and illuminating.

<u>The Mimi A. R. Koehl and Stephen A. Wainwright Award for the Best Student Presentation in biomechanics.</u>
We had the unusual but lovely result of a tied vote for naming the Best Student Presentation Award. The Koehl-Wainwright Best Student Presentation Award is named after Mimi A. R. Koehl, Professor of Integrative Biology at the University of California, Berkeley, and Stephen A. Wainwright, James B. Duke Professor of Biology, Emeritus, Department of Biology, Duke University.

Mimi's research has been far reaching with a focus on biomechanics of organisms, from large to microscopic, that make their livings in turbulent and otherwise challenging environments. She has made us think about the world in new ways, providing a new view into these previously poorly understood systems. She has inspired students and other colleagues with

her intellectual drive and the innovative nature of her research and has been an influential role model and mentor to many in the field.

Steve's research on biomechanical systems has spanned nearly every axis of diversity from plants to animals, organisms from big to small, living in aquatic and terrestrial environments, providing many fundamental insights into structure-function relationships along the way. Steve is a generous mentor who has launched numerous careers in science and encouraged rich interdisciplinary exploration that melds art, science and other fields to generate new perspectives and directions for research.

It would take many newsletters to enumerate the contributions of these three colleagues to the field of biomechanics, and we will provide more complete synopses of their many accomplishments with the first named awards presentations at SICB 2016.

DCB Elections. Your involvement in the Division is critical for its success. I encourage you to vote on the slate of nominees presented later in the newsletter and to consider running for office in future years. This year the nomination process was run by Laura Miller and Mark Westneat. We thank them for their efforts to put together a terrific group of candidates.

Symposia. In 2015 DCB sponsored or co-sponsored a number of fantastic symposia. We want to keep DCB contributions to the symposia sessions at this high caliber and thus encourage you to propose ideas. Symposia are great ways to introduce new people and ideas to SICB. For biomechanics, there are many colleagues in engineering, computational biology, and other fields who may not have had the opportunity to get to know SICB and would be great additions to our community.

DCB/DVM Party 2016! We want to have an awesome joint DCB and DVM social/party for the Portland meeting! Anyone who wants to be on the party organizing committee or has ideas should send me an email (CHAIR.DCB@sicb.org) and we'll get the group together.

Can't wait until 2016 for more biomechanics? The **Society for Experimental Biology** meeting will be held in Prague June 30–July 3, 2015, and has biomechanics sessions, including one on the "Mechanics and biological functions of the arthropod exoskeleton." The **American Society of Biomechanics** meeting will be in Columbus, OH, this year, Aug 5–8. And look for announcements about **SICB regional meetings** in your area.

Carl Gans Award Nominations

The Division of Comparative Biomechanics is also soliciting nominations for the **2016 Carl Gans Award**. This prestigious award can be given in two contexts: (1) for an outstanding young investigator (PhD in past seven years) in the field of biomechanics, or (2) for a significant contribution to the literature (book, research paper, or other) on biomechanics by a member of SICB at any career stage. You may apply directly or nominate a colleague.

For awards for outstanding young investigator
Nomination materials: A short description of the nominee's work, relevant reprints, a CV, and three letters of support. Eligibility: Candidates must have received their doctorate in the past seven years and be current members of SICB. Candidates cannot have previously won the Bartholomew Award.

For awards for a highly significant contribution to the literature
Nomination materials: A copy of the work, a CV, and three letters of support. Eligibility: Candidates must be current members of SICB and not have won the Bartholomew Award.

The award covers appropriate expenses for travel to the SICB annual meeting, an award certificate and, depending on availability of funds, potential additional research support for the winner. The selection process will be led by John Long. Questions about the process can be directed to me (CHAIR.DCB@sicb.org) or John (jolong@vassar.edu); nomination materials should be submitted to me. **The deadline for nominations is 24 August 2015.**

Message from the Divisional Program Officer

*Joseph Thompson, **DPO.DCB@sicb.org***

The weather outside my office window in Lancaster, PA, over the last few days has varied from cold and miserable to bone-chillingly cold and miserable. Despite the respite of a beautiful little snowstorm followed by some sunny weather, the forecast calls for wind and another Arctic blast. It's definitely time to reminisce about West Palm Beach!

The 2015 conference in West Palm Beach was a busy one for our division. The DCB sponsored or co-sponsored over 395 presentations, divided into 4 symposia, 33 oral sessions, and 15 poster sessions. Thus, our division sponsored or co-sponsored more than one-fifth of the presentations at SICB this year! Included in this tally was an inaugural session dedicated to the best student presentation (BSP) competition. We heard seven excellent talks from our finalists. If you have any feedback about our new format for the BSP competition, please email me (**DPO.DCB@sicb.org**).

Looking ahead to the 2016 conference in Portland, OR, the DCB is co-sponsoring three symposia: (1) A bigger picture: organismal function at the nexus of development, ecology, and evolution; (2) Building an extravagant toolbox: morphological diversity of intromittent organs; and (3) Neuroecology: neural mechanisms of sensory processes that mediate ecologically relevant behaviors. If you are interested in proposing a symposium for the 2017 conference in New Orleans, the deadline is August 24, 2015. The symposium application form is available at **http://sicb.org/meetings/2017/callsymp.php**. The application webpage includes links to the NSF guidelines for funding symposia and important guidelines that the program officers will use to evaluate the proposals. Registration, lodging, and travel expenses can be paid from divisional funds (often more than one division) as well as from grants from outside agencies, journals and publishers, and equipment companies. Please let me know as soon as you can if you plan to submit a proposal, and I can share information about the symposium selection process. I also encourage you to contact those who have successfully obtained external funding for advice.

If you plan to give an oral or poster presentation at the 2016 meeting, choose your abstract topic choices with care. The DCB and DVM Program Officers organize abstracts submitted with the primary topic "Morphology." If you want your presentation to be handled by the DCB, please select "Morphology" as the first topic.

I look forward to reading your abstracts in September. See you in Portland!

Message from the Secretary

*Andie Ward, **Secretary.DCB@sicb.org***

As winter is holding on for dear life, it seems that it is the perfect time to remember warm and sunny West Palm Beach. The annual meeting was once again an exciting venue for the exchange of ideas. I thought that both the paper and poster presentation sessions featuring our finalists for the student awards were especially engaging and demonstrate the strong future of the division and society.

Divisional Elections. During the spring elections, we will be voting on two positions: Program Officer and Secretary. The nominees for Program Officer are David Hu of Georgia Institute of Technology and Jake Socha of Virginia Tech University. The nominees for Secretary are Matt McHenry of the University of California Irvine and Andie Ward of Adelphi University. If you are interested in getting involved in the society, feel free to contact me. We are always looking for members to serve on nominating and awards committees.

SICB Digital Library. I would also like to remind our members of two great digital resources for SICB members. The SICB Digital Library contains a fantastic repository of education materials that pertain to biomechanics (**http://sicb.org/dl/biomechanics.php3**). Please add to this database if you have materials that you think others might find useful. We also have a researcher's database for members of DCB (**http://sicb.org/divisions/DCB/researchers.php3**). This is a great opportunity for faculty who are looking to attract potential students, or students and post-docs who would like to publicize their work. Please contact me if you would like to contribute to the researcher's database.

Best Student Presentation Applications. Please remember to check the BSP guidelines prior to submitting extended abstracts. The extended abstract will be due at the same time as the meeting abstract this year.

If you have any events that you would like to have advertised, please let me know and I will incorporate them either into a newsletter or submit the information to the SICB member update that comes out monthly.

Minutes of the 2015 DCB Business Meeting

Election Information: Candidate Biographies

Candidates for Divisional Program Officer

David Hu

David Hu, Candidate for DCB Program Officer

Current Position: Associate Professor of Mechanical Engineering and Biology, Adjunct Professor of Physics, Georgia Institute of Technology, Atlanta, GA.

Education: Ph.D., Mathematics (2005), B.S., Mechanical Engineering (2001), Massachusetts Institute of Technology.

Professional Experience: Associate Professor, Georgia Institute of Technology (2014-present); Assistant Professor, Georgia Institute of Technology (2008-2014); NSF Mathematical Sciences Postdoctoral Fellow, Courant Institute of Mathematical Sciences (2005-2008).

SICB Activities: Co-organizer of 2014 symposium, "Shaking, dripping and drinking: surface tension phenomena in organismal biology." 2014-present: member of SICB Public Affairs Committee (PAC).

Other Memberships: American Physical Society.

Research Interests: I am a mechanical engineer who studies the influence of body size on animal form and function. Recently, I have applied this interest in two directions. The first is to understand how animals clean themselves. We have discovered how dogs shake to dry, how eyelashes reduce evaporation, and how bees use their body hairs to stay clean. Another thrust in my laboratory is to understand motion inside the body. We have discovered how all mammals empty their bladders in 21 seconds and are working on rationalizing the motion of the intestines.

Goals Statement: As a SICB attendee for the last 10 years, I am delighted to be nominated for program officer. As you may know, the goal of the program officer is to increase participation in our Annual Meeting. Based on the wise counsel of retired DCB program officer Laura Miller, I will focus on two goals. My first goal involves abstract organization. I will avoid putting an entire lab in one session, but instead will make exciting sessions with a mix of different laboratories, organisms, and age and rank of speakers. At the same time, I will avoid temporal overlap and long walking distances between similar talks. I will use my press experience to write creative and catchy titles to attract the press. My second goal involves new symposia. I will solicit exciting new ideas for symposium proposals, going beyond the traditional topics of swimming, flying and terrestrial locomotion, which are less competitive with proposals from other divisions because they are done again and again. I will use my network in the engineering community to pair an integral member of SICB with an outsider for symposium proposals. Overall, I hope to bring in fresh methods and perspectives to our already vibrant community.

Jake Socha

Jake Socha, Candidate for DCB Program Officer

Current Position: Associate Professor, Department of Biomedical Engineering and Mechanics, Affiliate, Department of Biological Sciences, Virginia Polytechnic Institute and State University, Blacksburg, VA.

Education: Postdoctoral Fellow, Argonne National Laboratory (2004-2007). Postdoctoral researcher, Field Museum of Natural History (2003-2004). Ph.D. in Organismal Biology and Anatomy, University of Chicago (1996-2002). B.S. in Physics and Biology, Duke University (1990-1994).

Professional Experience: Associate Professor, Virginia Tech (2014-present); Assistant Professor, Virginia Tech (2008-2014); Teacher and science department head, Centerville High School, Centerville, LA (1994-1996); Teach For America corps member (1994-1996).

SICB Activities: I ran the DCB's Best Student Presentation program for the past five years (2011-2015) and helped to transform the program to the new session-based format seen in West Palm Beach. I was a member of the Public Affairs Committee (PAC) for one term before serving as the PAC Chair for five years (2010-2014). As Chair, I founded the Student Journalism Program, oversaw the transition to Newswise press releases for the society, and helped to develop yearly PAC workshops. I am also currently serving as Editor for both the Student Journalism Program and the Newswise press release process.

Other Memberships: Sigma Xi; American Society for Engineering Education.

Research Interests: Comparative biomechanics of locomotion in vertebrates and internal flow production in insects. Generally my laboratory is interested in fundamental questions of how animals function mechanically, and we work on things ranging from gliding in flying snakes and surface-skimming in frogs to tracheal ventilation, circulation, and liquid feeding in a broad range of insects. For more information, see **www.esm.vt.edu/~jjsocha**.

Goals Statement: DCB is relatively new, but is going like gangbusters. As the Program Officer, my goal is to keep the fire stoked and to promote new biomechanics-related symposia, workshops, and sessions. Probably the issue most important to all of us is the placement of talks and posters in the 'right' session, and I'll work hard to put together the most organic groupings possible. (And, give the sessions a catchy name.) As Chair of the PAC, I have attended the programming meeting and know how to navigate those shark-infested waters. I'll fight to put together the best schedule possible, and promise that only Frank Fish will have to present in the last time slot.

Candidates for Secretary

Matt McHenry

Matt McHenry, Candidate for DCB Secretary

Current Position: Associate Professor, University of California Irvine.

Education: Ph.D., Integrative Biology, UC Berkeley (2002); B.A., Biology and Art, Vassar College (1995).

Professional Experience: Assistant and Associate Professor of Ecology and Evolutionary Biology, UC Irvine (2005–present); Postdoctoral Researcher, University of Groningen (2004-2005); Postdoctoral Researcher, Harvard University (2002-2004).

SICB Activities: "Southwest Organismal Biology" Regional Meeting, organizer (2014); Symposium "When Predators Attack," co-organizer (2013); Symposium "Sensory Biomechanics," co-organizer (2009); Student Support Committee, member (2008); Best Student Presentation Competition, DCB, Chair (2003-2004).

Other Memberships: Society for Experimental Biology; American Physiological Society; the International Society for Neuroethology; Sigma Xi.

Research Interests: The biomechanics and sensory biology of animals. Recent research has focused on predator-prey interactions in fish.

Goals Statement: Biomechanics has exploded at the SICB annual meetings in the past 15 years. Guided by our senior leadership and fueled by the recruitment of great young minds, SICB has become the top annual event in the world for comparative biomechanics. I would like to see us build on this momentum by communicating to existing members the opportunities that exist in DCB. I am also keenly interested in ways that we can expand the diversity of our community through the students that we attract and by inviting scientists from related fields of study to participate in our meetings.

Andie Ward

Andie Ward, Candidate for DCB Secretary

Current Position: Associate Professor of Biology, Adelphi University, Garden City, NY.

Education: B.S., Biology, Wake Forest University (2000); Ph.D., Organismic and Evolutionary Biology, University of Massachusetts Amherst (2005).

Professional Experience: Associate Professor, Department of Biology, Adelphi University (2012-present); Assistant Professor, Department of Biology, Adelphi University (2007-2012); Postdoctoral Scholar, Department of Organismal Biology and Anatomy, The University of Chicago (2005-2007).

SICB Activities: Secretary, DCB (2014-2015); Member, Public Affairs Committee (2009-2013).

Other Memberships: International Society of Vertebrate Morphology.

Research Interests: body shape evolution, including how body shape affects locomotory performance in aquatic vertebrates; the effects of environmental perturbations on musculoskeletal development in fishes.

Goals Statement: The field of comparative biomechanics is an exciting field to be working in. Over the past year, I have worked on behalf of the division to engage more participants. I want to help the division continue to grow and recruit new members, as well as retain our current members. As secretary, I will continue to work to get the message of the division out to the membership, society, and into the public sphere.

Highlight from the Researchers Database: *How fish alter their swimming mechanics and physiology when exposed to turbulent flow environments; James Liao*