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In this issue

	page
From the President	1
Student's Corner	2
Secretary/Membership	6
Treasurer	7
Education Committee	8
ASB Fellows Forum	10
Past-President	14
ASB Facebook	18
Scenes from the 40 th ASB	20
Communications	22
Nat. Biomechanics Day	24
Program Chair	33
Meeting Chair	34
Diversity Committee	36
President-elect	38
Umbrellas are for Tourists	40
Events Calendar	45

Newsletter

Volume: 30 - Number: 2, December 2017

From the President

Wendy Murray



Greetings ASB Members! I hope the 2017-18 academic year is going well. By now, you have received the call for membership renewal; if you haven't renewed, the beginning of the new year is a great time to do so. It's also a great time to mark your calendar for [National Biomechanics Day 2018](#) (April 11). In 2017, NBD more than tripled in size to include over 7,600 high school students, and based on the [NBD Twitter feed](#), I understand the goal of 2018 is to (at a minimum) triple in size again. It's a lofty goal that will not be accomplishable without all of our contributions. Make sure to sign up, and start planning now!

The growth and popularity of NBD should not be a surprise, given the growth and popularity of the ASB Annual Meeting over the years. My first introduction to the topic of growth of the ASB Annual Meeting was in 2010, as newly minted Program Chair for 2011. As I sat in the Executive Board Meeting at the convention center in Providence, the discussion reflected the fact that the number of abstracts, posters, and attendees at the meeting were each on the order of hundreds more than the organizing committee had originally anticipated. Fortunately, given the size of the convention center—especially the wide, open space which allowed as many posters as the program committee wanted to accept to remain up for the length of the entire meeting—the meeting simply expanded. Unfortunately, for the 2011 Annual Meeting, the meeting space (chosen at least 2 years before) did not have the same capacity. Over the next few months, the Long Beach meeting's hosts threw out their original plan and worked to optimize the available space to maximize posters. (Thanks George, Chris, and Susan!) Given vocal support for posters as an enjoyable and effective way to both exchange scientific thought and socialize, we moved forward with a plan to deal with increased participation in the meeting by accepting a large number of posters; the only other possibility in 2011 given the space constraints was to reject a large number of abstracts. However, each poster could only be made available for a single day of the conference. To mitigate this, we opted for 4-hour poster sessions with rotating presentation times for different posters within that block. We also pushed back the end time of the conference from mid-day on Saturday to closer to 5 pm.

Fast forward to 2016, and the discussion in the Executive Board Meetings in Raleigh was like déjà vu all over again—this time with even more abstracts and attendees. Similar to the 2010 meeting in Providence, the 2016 meeting was in a

Continued on page 3...

Student's Corner

Katie Knaus

Hello from Virginia! The 41st ASB meeting held in Boulder, CO on the University of Colorado campus this past August broke records for student attendance and presentations. The Student Mentoring Program paired 128 students with mentors in academia and industry. Thank you to all of the students who actively participated in this program! A special thank you goes to all of the mentors because without you this program would not be possible. Mentoring will continue at the 2018 meeting—sign up to participate during conference registration, and find more information on the ASB website.



The meeting in Boulder was filled with excellent opportunities for students to network with each other and other conference attendees, including the Women in Science Cocktail Hour and Diversity Breakfast. The Student Career Round Table enabled over 100 students to engage in discussions on 20 different topics led by biomechanics experts in industry, academia, research, and more. Students branched out at the Networking Lunch to meet others from different labs and find things in common, and received advice for making the most of the conference at the Student Welcome. Students gathered to casually network at the Student Night Out, which provided a chance for students to leave the CU campus to enjoy appetizers, desserts and local beers at Fate Brewery, and at the Student After-Reception Party in the CU student center with bowling, billiards, and other games. Thanks to everyone who came out and made these events a great success!

I'd like to thank the outstanding members of the 2017 & 2018 ASB student advisory committees (Simi Oludare, Ana Ebrahimi, Andrew Vigotsky, Daniel Kuhman, Amanda Stone, Samuel Acuna, Ryan Wedge, Bhushan Thakkar, Jana Jeffers, Anthony Anderson, Kelley Virgilio, Katie Pelland, Samuel Masters, Becky Krupenevich, Ben Connor, Ryan Alcantra, Erica Casto, Chris Curran, Hunter Wallace, and Amanda Meppelink) for their hard work and continued effort to promote student interests in ASB! We are already planning exciting student programming for 42nd Annual Meeting this August in Rochester, MN, but we really want your input. I will be sending a survey over email soon. Please fill it out to let us know what programming you have most benefitted from and let us know ways we can do better.

Finally, I want to remind students about some of the resources and opportunities available to you as members of ASB. There are education and career resources available on the ASB website that are especially helpful for students. We continue our effort to expand ASB's Facebook presence. Check out the Facebook Highlights later in the newsletter and be sure to like and follow [ASB's page](#)! The Graduate Student Grant-In-Aid (GIA) rewards promising students by supporting their research with a one-year \$,2000 grant, and the deadline to apply is January 15th. (Ed. note: this deadline has passed.) Student Travel Awards provide funds to present at the annual meeting. These are due in mid-March, so be sure to apply when you submit your abstracts! I encourage students to go to the ASB website to learn more about these awards and to apply for them. Feel free to [email](#) me with any questions or suggestions!



ASB Involvement

If you are interested in becoming more active in the Society (e.g., serving on a committee or chairing an annual meeting session), contact [Stacie Ringleb](#), Secretary/Membership Committee Chair, with your name, address, phone/fax number, email address, and your desired involvement. This information will be included in a database which is periodically updated and distributed to the Executive Board.



Back Copies of the Newsletter

All previous ASB newsletters have been converted into pdf documents and are archived on the [ASB website](#).

From the President, cont.

Wendy Murray

convention center and effectively accommodated demand. But our meeting hosts for 2017 in Colorado were presented with the same optimization problem as the 2011 Long Beach organizers: how do we accommodate as many attendees and presentations as possible, given the finite amount of space? As those who attended the Boulder meeting know, this problem was solved creatively; for example, new presentation formats were added to the meeting—formats that, based on responses in the meeting evaluations, were very popular with attendees. Notably, some of the solutions involved were also fairly laborious. For instance, the lecture hall where the full congress met to hear the daily announcements, keynote addresses, and award symposiums was broken down, re-arranged, and set-up each day so that it could also host a larger poster exhibit. Finally, there was also real concern that, if left un-checked, the number of attendees might surpass what the meeting space could manage. As a result, an absolute limit in attendee numbers was set.

The growth of the ASB meeting is an excellent and exciting development for our society, but it presents difficult challenges that currently are solved by each (volunteer!) meeting organizer individually—given the unique constraints of their space, time, and the ever-increasing number of record-setting abstract submissions. This year, the Executive Board seeks to gather input from ASB members to understand current opinions about the Annual Meeting, as well as their preferences regarding what sort of changes should be implemented. An important goal is to reduce the burden on meeting and program organizers, while still delivering an Annual Meeting that addresses the needs and expectations of our members. The Biomch-L thread initiated by Steve Piazza in July, and then re-visited at various times in late summer and fall was an effective discussion that touched on many of the common points that have been made in Executive Board meetings and meeting surveys over the years. The first suggestion is almost always to deal with increased abstract submissions by increasing the number of posters; this suggestion is often followed by a question of whether we either want, or should, restrict the number of abstracts accepted instead. Reasoning associated with rejecting a relatively large number of abstracts cites the curation of only the highest quality abstracts for presentation at the conference as a means to emphasize the scientific impact of our society. Similarly, the discussion of limiting the number of meeting attendees generally seeks to protect the unique networking and camaraderie provided by the ASB meeting. Given that most of us also attend much larger meetings (e.g., ACSM, BMES, ORS, SfN), many recognize the important role that attending a relatively small, friendly meeting has. Most senior members believe this characteristic of the ASB Annual Meeting was really important in our own scientific development, and want that, as well as the sense of community a smaller meeting has fostered, to not be lost for the junior biomechanists.

What was spectacular about the Biomch-L thread, from my perspective, is that—for the first time since I've been involved with these discussions—the conversations went deeper. I was interested to read about how, even as poster sessions became larger, members could find their experience presenting a poster to be iso-

From the President, cont.

Wendy Murray

lating. Specifically, limited opportunities to present their work (when the space constraints eliminated the possibility of posters being available throughout the meeting) combined with a small number of attendees actually stopping by to discuss their poster content were cited as negatives. The discussion of this issue, in particular, is a good reminder to us that simply adding more posters, without effective solutions for the space the posters are presented in, the time people have to view posters, or consideration of whether people are actually attending posters sessions, isn't necessarily a solution that works well for poster presenters. Anecdotal, we've noted an increasing rate of people withdrawing their submissions from the conference after receiving notification that their abstract was selected as a poster, which emphasizes to me that our poster experience could be improved.

Once these kind of problematic issues started to be expressed on the Biomch-L thread, ASB members also started generating ideas about how to solve them. A number of interesting solutions were suggested, including: holding student poster competitions similar to the SB³C conference; planned, facilitator-guided "tours" of posters; and altering the format of the conference so that a single conference day is (save a keynote or awards session) only posters. This type of membership-sourced idea generation is exciting and is the type of input we need in order to have a lasting and satisfactory impact on the ASB Annual Meeting as it grows.

One of the main realities to come out of the ongoing discussion about meeting growth is that ASB's most recent Strategic Plan expired in 2012. Thus, when the Executive Board tries to evaluate conflicting options for how to deal with the logistical and planning problems associated with increased abstract submissions and attendance, the only agreed upon priorities to review were identified in 2007. The bad news is, many of these priorities are out of date or don't help us make a decision about a problem in 2018. The good news? They are out of date because the Society has already achieved them. Ken Kaufman, who led the effort to define a 5-year Strategic Plan in 2007 will be working with a group of ASB Fellows to describe where we started in 2007 vs. where we are now. This summary will be included in the Summer 2018 Newsletter. In addition to this summary of what we have accomplished, the Executive Board is considering a formal self-study to continue to learn more about what the membership is looking for from the meeting and ASB in general. At the 2018 Meeting, I'll be leading an open discussion, intended to summarize what we've learned, where we are at, and to provide opportunity for more member input and group discussion. As the 2018 Annual Meeting wraps up, we expect the information gathering process associated with my presidential year to transition into actual writing of a new Strategic Plan in Brian Umberger's presidential year. I'm excited about the potential these discussions have to inform our new initiatives, and have a lasting impact on our society.

I end with a plea for participation. Keep in mind that, like the Biomch-L thread, we will be reaching out to our members in various ways, extending through the discussion forum at 2018 Annual Meeting. The more you share your thoughts and opinions, the more our long-term decisions will reflect our membership!



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ASB Newsletter



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Secretary/Membership

Stacie Ringleb



Greetings ASB members. Now that I am accustomed to the new membership system CVent, I would like to recruit 3-4 regular members to help screen membership applications. Between March and December of 2017, I screened 166 membership applications, the majority of which will come in between March and June (from abstract submittal to around the early registration deadline). Please [contact me](#) if you're interested in helping out with this committee. Additionally, this is my last year in this position. If you are interested in running, please feel free to contact me to find out what this job entails.

We continuously update information we collect from our members to help our committees serve our members better and to also help the society obtain funding to support efforts such as the diversity travel award. The society developed a [confidentiality statement](#) to ensure that we protect the information that individuals provide us. In 2018, we added some and changed a few categories of information that we are collecting. With multi-disciplinary work, most of us work across the five disciplines of the ASB. This year, while we still ask you to identify your primary discipline, you can also select other disciplines that you work in. The education and student committees requested information about the degrees that our members have, the degrees they're pursuing (if applicable), and job title. To help a variety of society needs we have also allowed for you to select research key words. Finally, to provide additional information for R13 (NIH Support for Scientific Conferences) applications, the diversity committee is now collecting gender information, instead of sex, and allowing people to select more than one race. We are continuing to collect the same information about ethnicity and disability.

As of December 31, 2017, we have 964 regular or student members, which is an increase of 25 at the same time in 2016. 260 members renewed their membership for 2018 by December 31st. As in the previous years, Amazon gift cards were awarded to members who renewed by January 15th (\$60 to a member who renewed by December 20th, \$40 by December 31st, and \$20 by January 15th). Looking at the demographics, we have 596 regular and 368 student members. The primary disciplines of our members are: 46 in the biological sciences (an increase of 9 over 2016), 412 in engineering and applied physics, 51 in ergonomics and human factors, 283 in exercise and sports science, and 160 in health sciences. Because we have already started to collect gender data, but not everyone has renewed their membership, we have both sex and gender information in our database. Currently we have: 258 females and 88 women, 425 male and 162 men, and 5 who didn't wish to answer. There are 5 members who are American Indian/Alaska natives, 127 Asian members, 23 Black/African American members, 2 Native Hawaiian/Other Pacific Islander members, 36 who selected "other" for race, 702 White members, and 57 members who didn't wish to answer. For our members who have reported their ethnicity, 96 are Hispanic or Latino, 773 are not Hispanic or Latino, and 52 did not wish to answer. For disability, we have 896 members with no disability, 14 with a disability, and 46 people who didn't wish to answer. We still have a few members who don't have a primary discipline listed, along with some unreported demographic information in our database. Please make sure you update this information in our [membership portal](#).



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This year ASB sponsored five regional meetings for a total of \$10,000. We provided five Grants in Aid to our members (\$10,000 total). We awarded 21 travel grants for a total of \$5,250. We also provided a financial award for the Hay, Borelli, Goel, Founder, Young Scientist, and Junior faculty awards for a total of \$10,500. Finally, Elsevier sponsored two \$1,000 awards for Clinical Biomechanics and the Journal of Biomechanics. In total, ASB provided society members with nearly \$40,000 in awards and meeting support. We plan to continue to sponsor these awards in 2018 so submit your nomination packets and materials for travel grants now!

The Colorado meeting was a success on many fronts! Thanks again to the Colorado Team for hosting the 2017 ASB Conference! In terms of the meeting budget, the Colorado team budgeted a break-even point with 800 participants and we had 1000 attendees—the largest ASB conference ever! This, along with the conference being hosted on a budget-friendly campus, resulted in a surplus of about \$59,000. As our meetings grow, so does the financial risk and uncertainty; so, our hosts set prices according to the best estimate of the number of conference registrations—and these fluctuate depending on the conference location and the economy. As these surplus funds are transferred to ASB, the executive board is going to consider depositing some of that money into our long-term reserves. Our reserve funds total around \$207,700 right now, up about \$4,000 since June. We do not spend these reserves; they are there in case we encounter issues with a meeting—such as a natural disaster, and the meeting is not held, yet we are past the point of obtaining deposits back. For the last few meetings, total meeting costs have been above \$300,000 and the society would like to have enough reserve funds to cover a meeting if there were an issue.

Our checking account is healthy; it currently has \$50,000 in it for ASB use. We also have set funds aside to be used as a starter loan for the 2018 meeting; hosts require down-payments on event locations prior to funds coming in from registrations. These funds are repaid once the conference registration process is underway.

Finally a thank you to Brenda Bowen and Lyndie Pope for their continued assistance; as Treasurer, I work with both of them on the ASB accounting and tax documents.

That's all I have for the finances. Feel free to contact me if you have questions!



Education Committee

Kimberly Bigelow



The Education Committee has had a busy year, which you hopefully observed evidence of if you were able to attend the meeting in Boulder. This committee is responsible for a range of activities that we hope will support our members at all levels of their careers. These activities include facilitating the graduate student Grant-in-Aid program, hosting our society's teaching repository, and promoting increased participation of our membership in the scholarship of teaching and learning. For our annual meetings we also oversee the review of teaching-related abstracts, as well as facilitate the conference tutorials, teaching symposium, and other education-related events (such as the 2017 Teaching Roundtables). We couldn't do all of this hard work without our dedicated Education Committee members:

- Grants-in-Aid Sub-Committee: Erika Nelson-Wong (Team Lead), Louis DiBerardino, Kaitlin Gallagher, Jessie Huisinga, Missy Thompson, and Alex Shorter
- Teaching Repository Sub-Committee: Patrick Ryder (Team Lead), Lieselle Trinidad, and Scott Monfort
- Promotion of the Scholarship of Teaching and Learning in Biomechanics Sub-Committee: Kim Fournier (Team Lead) and Erin Feser.

We also work closely with student rep Katie Knaus who ensures the voice of our student members is represented in all of our sub-committees and efforts.

Before highlighting the work of each of our sub-committees, we want to first celebrate the increasing interest and emphasis on all things education! This past year saw record high number of Grant-in-Aid applications and teaching abstract submissions, increases in members and snippets on our teaching repository, and new education-related conference events that were very well attended. We hope we can maintain—and grow—this great momentum this coming year!

And on to our sub-committee updates... Relative to the Grants-in-Aid sub-committee, we want to remind ASB master's students, doctoral students, and faculty mentors of the upcoming ASB Graduate Student Grant-in-Aid deadline of January 15, 2018. (Ed. note: This date has passed.) The [Grant-in-Aid program](#) annually awards approximately 5 awards of up to \$2,000 each to support promising graduate student research. Please see the ASB website on how to prepare and submit your applications. We would love to see an increase in applications submitted. Feedback is provided to all applicants to help further develop your skills in writing grant applications and suggest possible improvements to your proposed projects.

Moving on to our Teaching Repository sub-committee... Our Teaching Repository went live in August 2016 and has continued to grow. We now have 348 users and 42 snippets! If you aren't already registered, please do so [here](#) and check out the educational activities and lessons ("snippets") others have contributed to



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Education Committee, cont.

Kimberly Bigelow

share with you and inspire you. While you have some downtime between semesters also please consider uploading your own “snippets” of activities that you have tried in the classroom so we all have new ideas to try when our new semesters start in January. Many of the resources that have been uploaded are outreach activities for K-12, so as you begin to think about National Day of Biomechanics make sure you take a look for ideas and encourage your area K-12 teachers to register so they can browse too!

The Promotion of the Scholarship of Teaching and Learning in Biomechanics sub-committee was created last fall. The committee has been very excited to help support others wanting to think about their educational approaches from a more scholarly perspective. Kim Fournier and Erin Feser put together a terrific teaching symposium at the 2017 meeting to discuss resources for those who want to start treating (and disseminating) their classroom activities with the same rigor as they treat their lab-based work. They also helped provide a venue to share more practical every day tips and strategies through the Teaching Roundtable event. The resources and tips that emerged from these events were made available on the Teaching Repository so be sure to check them out if you missed them!

As we promote the scholarship of teaching and learning in the field of biomechanics, we strongly encourage ASB members to consider submitting teaching-related abstracts to the ASB meeting this year. While teaching-related abstracts are always invited through the regular abstract submission process, we have historically only gotten one or two. For many of us teaching makes up an important part of our jobs; please let us share together—whether it be highlighting a successful classroom activity or sharing the results of a more formalized pedagogical study.

In looking ahead to the 2018 conference, we will also soon be selecting tutorials and structuring our teaching symposium. Tutorials are offered at the beginning of the meeting and normally include one geared toward professional development (e.g., grant writing, leadership development, etc.) and one geared toward technical skill development (e.g., IMU best practices, introduction to non-linear analyses, etc.). If you have an idea for a topic, or wish to be considered as a tutorial presenter, please [contact me](#).

And finally, another area the committee oversees is the award of ASB Regional Meeting support. These meetings will be held throughout the United States in Spring 2018. Check the [ASB website](#) to find your closest regional meeting and plan to attend these fun, student-centric events.

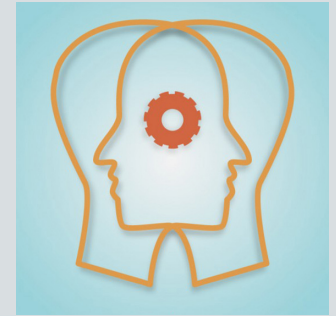
I look forward to hearing ideas from our membership on how we can best serve you and your needs. Please send ideas or concerns to me via [email](#).

“I have not failed. I’ve successfully discovered 10,000 things that won’t work.”

- Thomas Edison

ASB Fellows Forum

Roger Enoka



Among the many engaging presentations I heard at the Boulder meeting, I was most interested in those on the control of muscle actions by the nervous system. Aside from the new knowledge I gained, for which I am grateful, I was struck by the frequent use of the word “eccentric” to describe any muscle action in which the length of an activated muscle-tendon unit was increased by an opposing load. When I mentioned this observation to Paul DeVita during a post-meeting vacation in Breckenridge, he suggested I consider explaining my concerns in the Fellows Forum of the ASB newsletter. The purpose of this commentary, therefore, is to explain why I think we should be more discriminating when describing a lengthening muscle contraction.

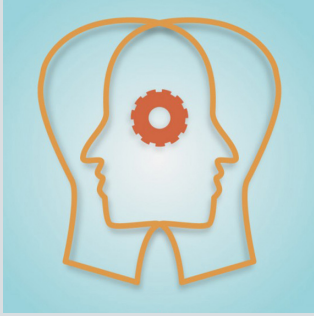
The fundamental issue has to do with how muscle actions are controlled by the nervous system. Some actions need only a feedforward command signal, especially when the action is brief and the state of the system remains predictable. Most actions, however require the modulation of a feedforward command by feedback signals to accommodate changes that emerge during the performance and ensure that it achieves the intended goal.

The lengthening and shortening of an activated muscle-tendon unit can be controlled by either feedforward control alone or by the combination of feedforward and feedback control. Some of us prefer to use the words “concentric” and “eccentric” to describe muscle contractions that are controlled by feedforward commands only. The most obvious examples of such tasks are those involving a constant level of muscle activation that is established at the onset of the action. Some examples include maximal contractions performed on an isokinetic dynamometer and the stretch component of a stretch-shorten cycle, which usually involves submaximal contractions (Duchateau and Enoka, 2016).

An example of maximal concentric (left) and eccentric (right) contractions as performed on an isokinetic dynamometer is shown in Figure 1 (Aagaard et al. 2000). Note that the net knee extensor torque applied to the dynamometer decreased during the concentric contraction, but increased during the eccentric contraction. Critically, the amplitude of the surface-recorded electromyographic (EMG) signals for the three muscles remained relatively constant during both maximal contractions.

The lengthening of a muscle-tendon unit during the stretch phase of a stretch-shorten cycle is also controlled by a feedforward signal. In contrast to the contractions shown in Figure 1, however, the level of muscle activation during the stretch is less than maximal, unless the movement (e.g., hopping, jumping, running, or throwing) involves a maximal effort performed by a highly trained athlete. Moreover, much of the increase in the length of the muscle-tendon unit during the stretch occurs within the tendon. Indeed, it has been shown that the lengths of muscle fascicles either decrease (shortens) or do not change during the stretch phase of the stretch-shorten cycle (Kawakami et al. 2002).

In contrast, actions that involve the modulation of a feedforward command by feedback signals involve a varying level of muscle activation throughout the task. Instead of describing these muscle contractions as either concentric or eccentric



ASB Fellows Forum, cont.

Roger Enoka

actions, some of us prefer the terms shortening and lengthening contractions (Duchateau and Enoka, 2016). Examples of such actions are lifting and lowering an inertial load to specific endpoints or tracking a target torque on an isokinetic contraction.

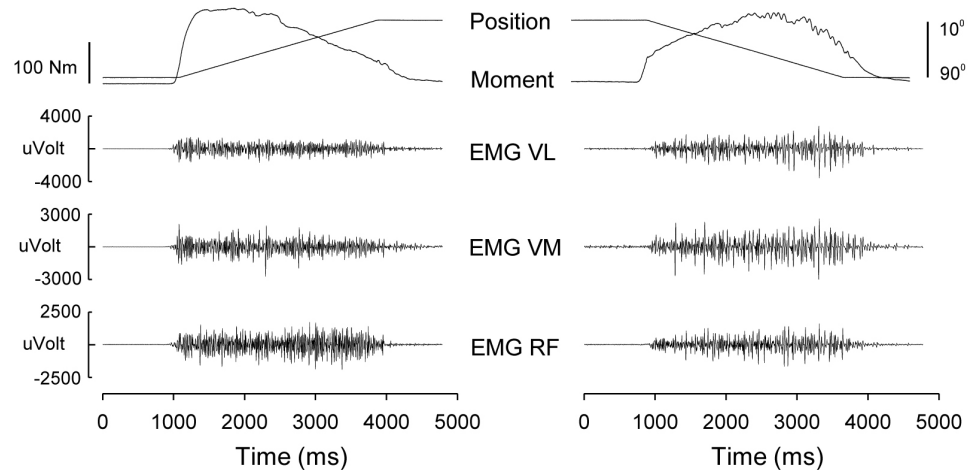


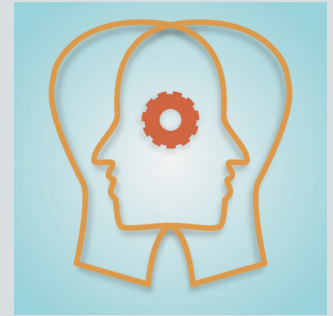
Figure 1. Maximal concentric (left) and eccentric (right) isokinetic contractions with the knee extensor muscles. The range of motion for both contractions was 80 deg and the imposed angular velocity was 30 deg/s. The interference EMG signals are shown for vastus lateralis (VL), vastus medialis (VM), and rectus femoris (RF). The figure was provided by Professor Per Aagaard.

An example of the latter is shown in Figure 2. The graphs show the instantaneous discharge rate (reciprocal of the time between consecutive action potentials) for two motor units in tibialis anterior during submaximal shortening and lengthening contractions performed with the dorsiflexor muscles on an isokinetic dynamometer. The task of the subject was to track a prescribed torque trajectory (not shown in the figure) so that the change in fascicle lengths was similar during both contractions. One motor unit (top row) increased its discharge rate during the shortening contraction and decreased it during the lengthening contraction. The second motor unit (bottom row) was recruited during the shortening contraction and derecruited during the lengthening contraction. The modulation of motor unit activity during both contractions was accomplished by feedback signals altering the level of muscle activation to perform the target-tracking task.

An interesting feature of these two types of contractions is that the modulation of motor unit activity during lengthening contractions is not simply the converse of that required for shortening contractions. There are two reasons for this difference. First, the intrinsic force capacity of muscle fibers is greater during lengthening contractions. Second, the net muscle torque must be greater than the load torque during a shortening contraction, whereas it must be less than the load torque during a lengthening contraction. Due to these constraints, the dis-

ASB Fellows Forum, cont.

Roger Enoka



charge rate of motor units typically decreases when lowering an inertial load with a lengthening contraction, but not when lifting it with a shortening contraction. Nonetheless, the recruitment order of motor units does not differ during shortening and lengthening contractions (Enoka and Duchateau, 2017).

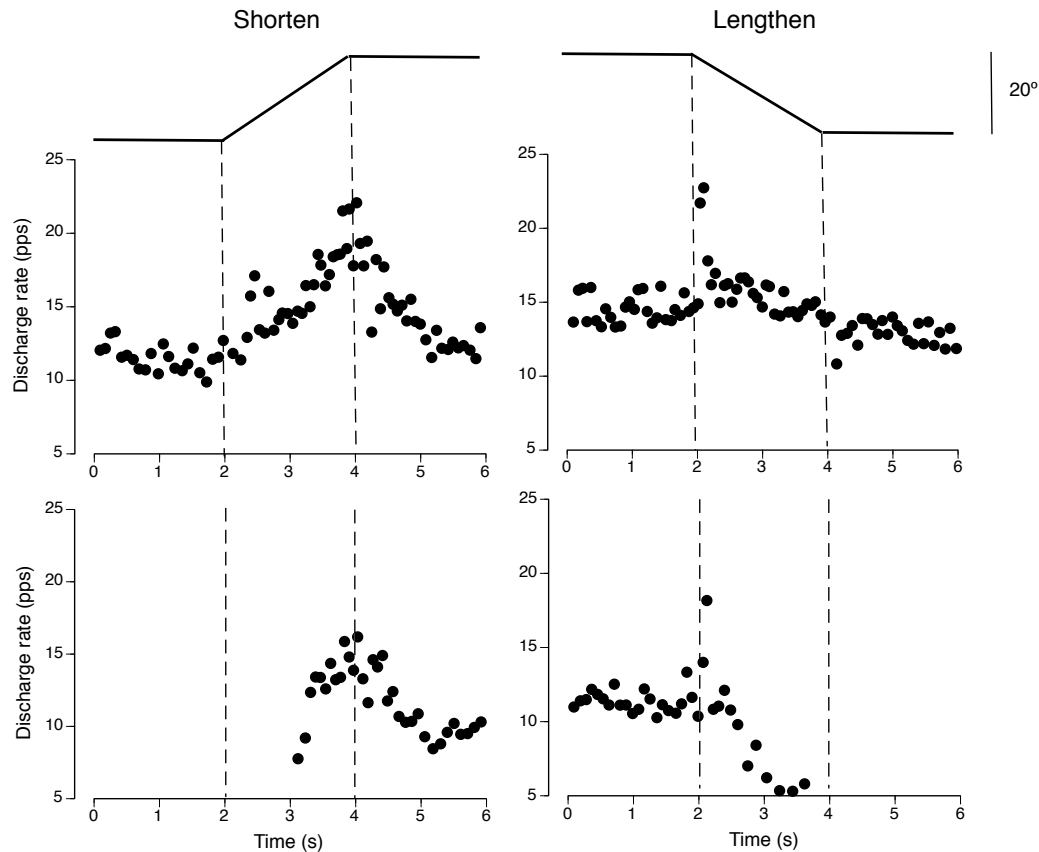
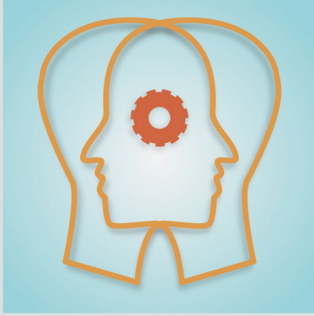


Figure 2. Modulation of discharge rate for two motor units in tibialis anterior during submaximal, shortening and lengthening contractions in which the dorsiflexor muscles pushed against a torque motor. The dashed vertical lines indicate the beginning and end of each contraction. Adapted from Pasquet et al. (2006).

The functional significance of the difference in modulation of motor unit activity during shortening and lengthening contractions is that the ability to produce an accurate force trajectory is typically compromised for lengthening contractions before that for shortening contractions. For example, during the early stages of rehabilitation after knee surgery it is easier to lift a light load slowly with the knee extensors than it is to lower the load steadily. Similarly, older adults have greater difficulty performing steady lengthening contractions when lowering a light load than when lifting it with a shortening contractions. In contrast, the main functional difference between concentric and eccentric contractions, despite the greater peak muscle torque that can be generated during an eccentric contraction, is that most individuals are unable to achieve complete activation of a muscle during maximal eccentric contractions.

When considering the control of muscle activity by the nervous system, therefore,



ASB Fellows Forum, cont.

Roger Enoka

it seems preferable to distinguish those actions controlled by feedforward commands (concentric and eccentric contractions) from those in which a feedforward command is modulated by feedback signals (shortening and lengthening contractions).

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Past-President

Chris Hass

As Past-President, it is my duty to manage the awards process for the upcoming annual meeting. The ASB awards are listed below and details for applying are found on the [ASB webpage](#). I want to use some of my space to also remind everyone how the winners/finalists are selected. An Awards Committee is formed for each Award. The Past-President serves as a non-voting chair for all of the Awards Committees. Each 5-7 person committee typically consists of a mixture of junior and senior scientists and encompasses members from each discipline or field of application as identified in the membership record. We also aim to maintain gender equity in the review team. For reference, last year over 60 individuals participated in the review process. Management of conflicts of interest follow standard NIH/NSF guidelines. If in doubt, we error on the side of removing any possibility of conflict. The Awards Committees both score and rank the nominations. The scores and rankings are averaged and the award is given to the person with the best average evaluation.

The Borelli Award

This is the most prestigious honor given by the ASB. The award is named after Giovanni Alfonso Borelli, a mid-17th century Professor of Mathematics from Naples, Italy. He is considered by many to be the father of modern biomechanics. Borelli's major novel contribution, the treatise "On the Movement of Animals," puts forth numerous propositions on the movements and displacements of the limbs of man and animals. The award recognizes outstanding career accomplishment and is awarded annually to an investigator who has conducted exemplary research in any area of biomechanics. The awardee attends the Annual Meeting of the ASB to receive the award and to deliver the Borelli lecture. The award consists of an engraved plaque and a check for \$1,500. The application deadline is the abstract submission deadline for the 2018 Annual Meeting. The Borelli Award is open to all current ASB members, excluding current ASB officers and members of the Borelli and Hay Awards Committees.

Recent winners of the award are:

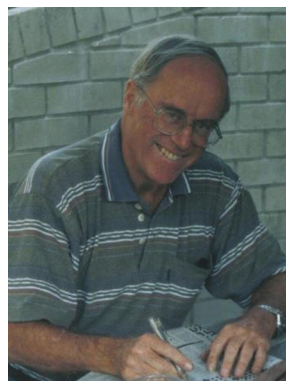
2017 Mark Grabiner
2016 Ted Gross
2015 Rodger Kram
2014 Vijay Goel
2013 Kenton Kaufman

The Jim Hay Memorial Award

The Jim Hay Memorial Award for Research in Sports and Exercise Biomechanics was established in 2004 through the support of the Hay family and additional donors to recognize research in the area of sports and exercise science biomechanics. Jim Hay (1936-2002) was a longtime faculty member at the University of Iowa, one of the original Founders of ASB, and the third and fourth President



Giovanni Borelli
(1608-1679)



2017 Award Summary

Borelli Award

Mark Grabiner,
University of Illinois at Chicago

Jim Hay Memorial Award

Rick Leiber,
Shirley Ryan AbilityLab

Founders' Award

Rick Neptune,
University of Texas at Austin

Goel Award for Translational Research in Biomechanics,

Trey Crisco,
Brown University



2017 Award Summary

Young Scientist Pre-Doctoral

Colin Smith,
University of Wisconsin-Madison

Young Scientist Post-Doctoral Award

Karl Zelik,
Vanderbilt University

Clinical Biomechanics Award

Michael F. Vignos, et al.,
University of Wisconsin-Madison; Boston University

Journal of Biomechanics Award

Matthew Q. Salzano, et al.,
Penn State University

Junior Faculty Research Award

Jaqueline Cole
North Carolina State University

President's Award

Aleksandra Budarick, et al.,
McGill University; Harvard University; Bridgewater State University

Research Travel Grant

Kaitlin Gallagher
University of Arkansas

Past-President, cont.

Chris Hass

of the Society. The Jim Hay Memorial Award recognizes originality, quality, and depth of biomechanics research that address fundamental research questions relevant to extraordinary demands imposed in sport and exercise. The winner will deliver the Hay Memorial Lecture highlighting how the study of biomechanical principles in the extraordinary context of sport can inform our understanding and directly impact performance or focus on central questions related to selected physiological systems, e.g., the musculoskeletal system, central nervous system, or cardiovascular system, that inform behavior at the extreme end of human performance. There will be a highlighted exercise and sports biomechanics session built around the Hay Lecture during the 2018 ASB meeting.

Recent winners of the award are:

2017 Rick Lieber
2016 Jill McNitt-Gray
2015 Timothy Hewett
2014 Fred Yeadon
2013 Glenn Fleisig

Founders' Award

The Founder's Award is given to recognize "scientific accomplishment in biomechanics and excellence in mentoring" and is open to investigators of all disciplines within ASB. This is a new award that was presented in 2017 for the first time. Nominees must be current ASB members who are between 5 and 20 years of their terminal degrees. Self-nomination is acceptable and the nomination packet requires three components: (1) letter of support that highlights research and mentoring activities of nominee, (2) full CV with research accomplishments and mentoring activities highlighted, and (3) up to 5 papers. The awardee must attend the Annual Meeting of the ASB in order to receive the award. The award consists of an engraved plaque and a check for \$1,000. The application deadline is the abstract submission deadline for the 2018 Annual Meeting.

The first recipient of the award was:

2017 Rick Neptune

Goel Award for Translational Research in Biomechanics

The Goel Award, newly created in 2016, recognizes outstanding accomplishments in translational biomechanics research, entrepreneurship, and societal benefit. The award is named after Dr. Vijay Goel, the Borelli Award winner in 2014, and is given annually to an ASB member. The Award was initiated by Dr. Goel's loving and devoted family. The Goel Award selection is based on originality, quality and depth of the candidate's research, and the commercial and societal benefits emanating from this research. This research is expected to have a biomechanical element. The winning candidate will have demonstrated the translational nature of his or her work from basic research to the enhancement of human health and well-being. The awardee must attend the Annual Meeting of the ASB in order to receive the award. The award consists of an engraved plaque and a check for \$1,000. The application deadline is the abstract submission deadline for the 2018 Annual Meeting.

The first recipient of the award was:

Past-President, cont.

Chris Hass

2017 Trey Cisco

ASB Junior Faculty Research Award (JFRA)

The purpose of this program is to support early career ASB regular members pursuing biomechanics research by offering a source of research funding. The grant is distributed on a competitive basis and is intended to offset the costs directly associated with conducting research. Funds may be used for small equipment items, materials and supplies, and animal or participant costs, but cannot be used to support salaries, graduate student stipends or hourly pay, or indirect costs of research. ASB anticipates awarding one grant of \$5,000 for a one-year period beginning in July each year. The deadline for submission of ASB Junior Faculty Award applications is February 28th of each year.

Recent winners of the award are:

2017 Jacqueline Cole

2016 Jeremy Crenshaw

Young Scientist Pre-Doctoral Award

This award recognizes early achievements by a promising young scientist prior to the award of their PhD. Selection is based upon the scientific quality of the submitted materials. The awardee must attend the annual ASB meeting to present their work in a special awards session. It is expected that the awardee will submit a full-length manuscript for publication in the Journal of Biomechanics. The award consists of an engraved plaque, a check for \$500, and a waiver of conference fees for the annual ASB meeting. The application deadline is the abstract submission deadline for the 2018 Annual Meeting.

Recent winners of the award are:

2017 Colin Smith

2016 Emily Lawrence

2015 Rachel Lenhart

2014 Laura Chernak Slane

2013 Arin Ellingson

Young Scientist Post-Doctoral Award

This award recognizes early achievements by a promising young scientist who is within five years of receiving their PhD. Selection is based upon the scientific quality of the submitted material. The awardee must attend the annual ASB meeting to present their work in a special awards session. It is expected that the awardee will submit a full-length manuscript for publication in the Journal of Biomechanics. The award consists of an engraved plaque, a check for \$500, and a waiver of conference fees for the annual ASB meeting. The application deadline is the abstract submission deadline for the 2018 Annual Meeting.

Recent winners of the award are:

2017 Karl Zelik

2016 Katherine Steele

2015 Jason Franz

2014 Amber Rath Stern

2013 Steve Collins



2017 Award Summary

Student Travel Awards

Anthony Anderson, University of Washington

Lindsey Brown, The Ohio State University

Geoffrey Burns, University of Michigan

Ming-Shen Chan, University of Southern California

Ying Fang, Worcester Polytechnic Institute

Reed Gurchiek, Appalachian State University

Jessica Hunter, University of Maryland

Alexa Johnson, University of Kentucky

Gu Eon Kang, University of Michigan

Koran Gast, Ben-Gurion University

Dan Kuhman, East Carolina University

Josh Leonardis, University of Michigan

Virginia Liang, Georgia State University

April McPherson, Mayo Clinic

Jamie Pigman, University of Delaware

Laksh Punith, North Carolina University & North Carolina State University



2017 Award Summary

Student Travel Awards, cont.

Amanda Ransom, University of Kentucky

Paige Rice, Appalachian State University

Ian Russell, University of Southern California

Annika Stoldt, University of Michigan

Bhushan Thakkar, Virginia Commonwealth University

ASB Fellows

Joseph Hamill, University of Massachusetts-Amherst

Nick Stergiou, University of Nebraska, Omaha

Darryl Thelen, University of Wisconsin-Madison

Past-President, cont.

Chris Hass

Clinical Biomechanics Award

This award recognizes outstanding new biomechanics research targeting a contemporary clinical problem, and is sponsored by Elsevier Science, Ltd., publishers of Clinical Biomechanics. The awardee will be expected to present their work at the ASB annual meeting, and submit their work for publication in Clinical Biomechanics. The award will be selected from submitted abstracts for the 2018 Annual Meeting. There will be a check box on the abstract submission page to check if you want your abstract to be considered for this award.

Journal of Biomechanics Award

This award recognizes substantive and conceptually novel mechanics approaches explaining how biological systems function. It is sponsored by Elsevier Science, Ltd., publishers of the Journal of Biomechanics. The awardee will be expected to present their work at the ASB annual meeting, and submit their work for publication in the Journal of Biomechanics. The award is selected from submitted abstracts for the 2018 Annual Meeting. There will be a check box on the abstract submission page to check if you want your abstract to be considered for this award.

Student Travel Awards

These are offered to help students attend the ASB annual meeting. There are a number of these awards and each winner receives an award of \$250. The application deadline is the abstract submission deadline for the 2018 Annual Meeting. If more than one application is received by students of the same advisor, only one will be funded.

Research Travel Grant

These awards are offered to foster collaborative research and interaction among scientists by helping to offset the cost of travel to a host institution. All ASB regular members are eligible to apply. Travel and lodging costs are covered. Budget requests may be up to \$1,000. Matching funds from the candidate's or host's institution are desirable, but not required. The deadline is March 1.

President's Award

This award recognizes outstanding research presented as a poster at the annual meeting. The award is judged solely by the President. All posters are eligible.

ASB Fellows

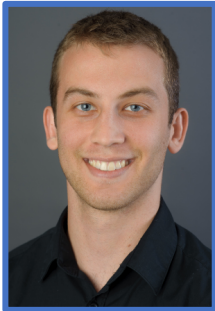
The other major duty of the Past-President is working with the ASB Fellows and Executive Board to elect new Fellows. In 2011, ASB created the status of Fellow to recognize professional achievement and service of the top members of the Society and to encourage continued service to the Society in leadership roles. To be considered for Fellow status, an applicant must have been a member of the Society in good standing for at least ten years, have a consistent and significant record of service to and participation in ASB, is expected to remain active in ASB, and has made significant research and scientific contributions in biomechanics. The applicant must have strong support from two nominating ASB Fellows (preferred) or one Fellow and a senior research scientist (with prior approval by the Past-President). Nominations should be directed to the Past-President by December 1.

Highlights from the ASB Facebook page

There has been a lot happening on ASB social media in the past few months. Some of the highlights include:

Student Spotlight

Read ASB students' answers to questions about their school/research experience!



[Steve Antos](#), PhD student in Biomedical Engineering advised by Drs. Keith Gordon and Konrad Kording, talks about how he balances his passion for clinical practice with a research-based graduate education.

[Shelby Peel](#), PhD student in Kinesiology and Sports Studies at University of Tennessee Knoxville advised by Dr. Joshua Weinhandl, shares how she became involved in research, and how her current project in ACL injury risk will expand into the future.



Who will
be next?



Let us know about ASB students who we should spotlight!

Q&A Join the [conversation](#) or ask a new question!

During the "Lower Limb Loss" rapid podium session at this year's ASB annual meeting, several researchers reported on data collected over several months. The point was made that longitudinal studies are highly valuable to our field and, likely because of their difficulty, are not conducted enough. Are there other data collections procedures, or even data itself, which are much needed in our field but are not often conducted?



Be sure to **like & follow** the [ASB page](#)

Use your settings to be notified of new posts!



Featured Biomechanics

Learn about cool things
happening in biomechanics!

Learn about the “[Generic Modeling Fallacy](#)” where average data as model inputs lead to non-average outputs in a Journal of Biomechanics article review by Andrew Vigotsky



See what happened on NBD 2017 around the world and check out the Student Competition winners for [Best Content](#) & [Greatest Impact](#) ... and get inspired for NBD 2018!

Discover [Kinovea](#) for easy 2-D motion tracking. Simi Oludare introduces this free software as a resource for teaching motion analysis in the classroom and launching student research projects



Check out [Biomechanics on the Web](#). This list, compiled by Ana Ebrahimi, includes: podcasts, blogs, TedTalks, videos, websites, and more!



See how biomechanics finds the spotlight at the [2017 IAAF Track and Field World Championships](#). Daniel Kuhman summarizes the huge research project that occurred at the event that saw the retirement of Sir Mo Farah and Usain Bolt.

Don't miss [highlights](#) from the 2017 Annual Meeting, including summaries of keynote and award sessions. Be sure to look through the [photo album](#) provided by Jing-Sheng Li, the official ASB photographer.



Share something that
you are excited about!

Want to contribute? Contact the [Student Representative](#)

Special thanks to the Student Committee for Biomechanics Advocacy for creating new content!



41st Annual Meeting of the American Society of Biomechanics
by Photographer Jing-Sheng Li and Editorial Assistant Cara Lewis



Communications Committee

Robert Catena

Winter greetings from the lentil capital of the world—Pullman, Washington. The snow is starting to get thick around here, which means the bike tires and the running gear is proportionally increasing in thickness. It was just a couple of months ago that I completed my first Spartan race under a much warmer sun. It was an interesting summer of training with my first attempt at CrossFit. Isn't it interesting how exercise equipment has reduced to an assortment of items you find in your garage and how strength training seems like a practice in coming up with new ways to use that equipment? Where does CrossFit fit in the evolution of strength training? Why over the last twenty years have we done a 180° in our exercises? What is the science that validates our newest ideas about strength training? This could make a great Reddit AMA (Ask Me Anything) for next summer's meeting if anyone is interested!

Over the past year ASB members have attempted a couple of new communication-related activities. Steve Piazza put together a couple of well received Reddit AMAs on [running](#) and [exoskeletons](#) during our conference in Boulder. Max Paquette and Blaise Williams put together a podcast on “[The Use of Biomechanics in Clinic and in Performance: Practical Applications](#).” We welcome other communications activities or ideas from our members, but it would also be great for our society to take ownership of, and be consistent with, some unique way of reaching out to the world. Maybe it is one of these ideas or maybe it is something else. Over my last few months as Communications Chair I will be reaching out to those I know to discuss possibilities, but I also welcome unsolicited ideas.

The Communications Committee (Tarang Jain, Scott Breloff, and Jason Franz) has ongoing responsibilities for website and social media presence. Our [Twitter](#) feed is going strong. You can stay up-to-date more easily with all the events if you stay connected with us through social media. If you have something going on that you want to us to advertise, let me know. We are currently at 2700+ followers!

Regarding our [webpage](#), we have a few ongoing needs and activities:

- We still need interesting research related pictures from our members to post on the scrolling photo banner of the ASB homepage. Having new photos keeps our website fresh, and providing your photos gets your research some free press. If you have some interesting photos and are willing to share, let me know. The pictures need to be 980 wide x 310 tall size to properly display in the ASB banner, so you can make it this size or we can crop the picture. Include a 1-sentence caption, with the name of the author plus affiliation. See the current ASB homepage for examples. No previously published pictures, no recognizable faces, and make sure the PI has given consent to posting the picture on the ASB website.
- A [Member Obituaries page](#) is on our website. If you become aware of other ASB members passing, please let us know so that we can honor them.
- ASB [regional meetings](#) in the Spring have been announced. These are great opportunities for a student-focused conference. Please inform your students.
- Many ASB grant and award applications will be coming due in the Spring. These due dates should all be up on our [google calendar](#).



Find us on Facebook or Follow us on Twitter

Facebook: [American_Society_of_Biomechanics](#)

Twitter: [@Am-SocBiomech](#)

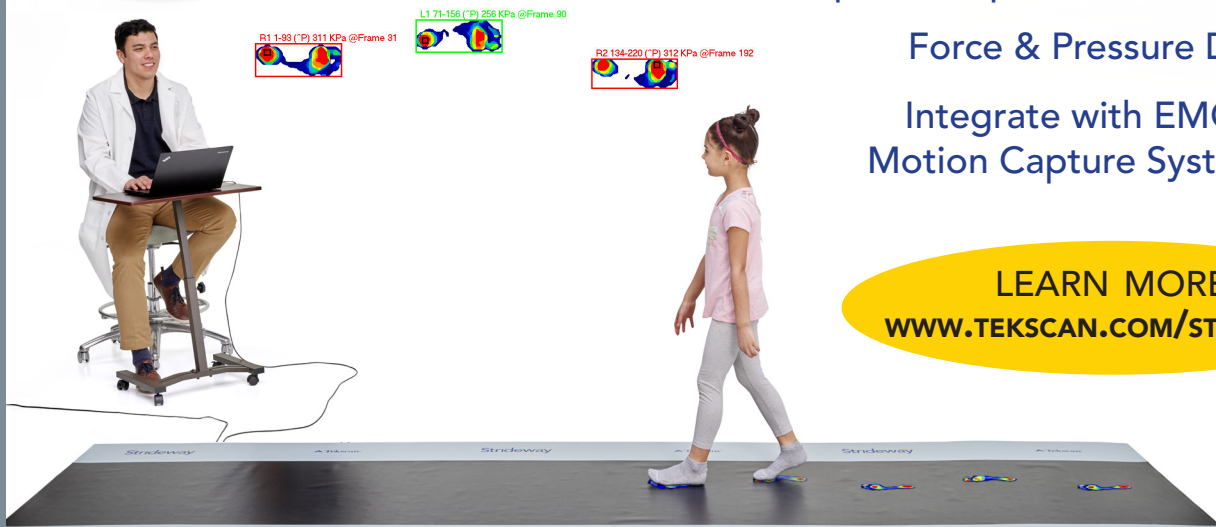
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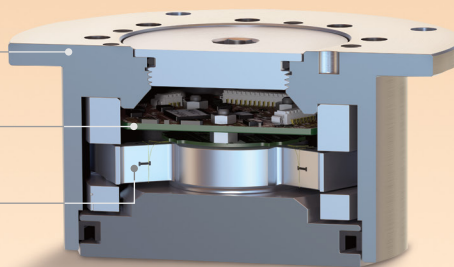
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National Biomechanics Day

Paul DeVita

Making Biomechanics the BREAKTHROUGH Science of the 21st Century

Hello Friends and Colleagues in ASB,

Through your enthusiastic support, National Biomechanics Day has been a tremendous success in its first two years. With participant numbers still coming in we have shared Biomechanics with over 9,500 high school students and teachers in 2016 – 2017. Here are a few hundred of them from 2017:



2018 National Biomechanics Day website



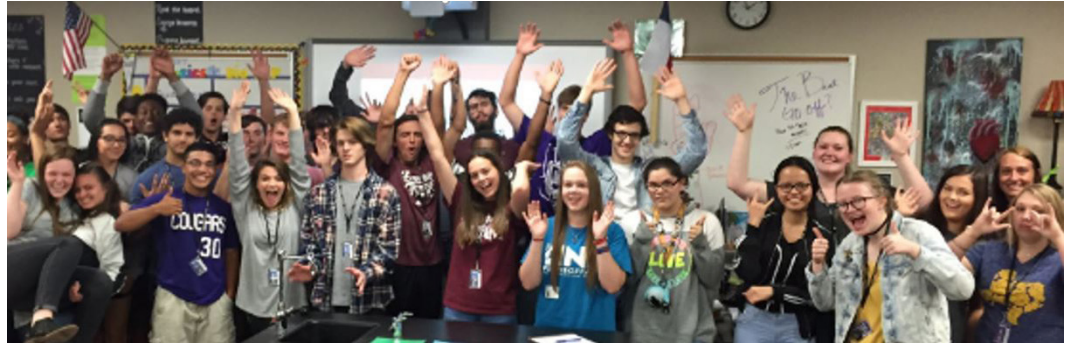
Because of this success we have set the incredibly incredible goal of having 20 to 30,000 high schoolers participate in NBD 2018. Wow. That will look like this...



National Biomechanics Day, cont.

Paul DeVita

...approximately, if you squint. We are making every effort to recruit every Biomechanist to participate and to hold NBDs at their institutions. Mysteriously, however, some have resisted our requests, our pleas and even our charms. "How could this be?" you ask. Well, so do we. However, we are supremely confident that everyone will participate because, well, it is just so unbelievably enjoyable. Just ask this group,



NBD 2018 is making important improvements. We are increasing the international participation through concerted efforts to recruit new people and institutions around the world. Sarah Shultz, Massey University, New Zealand, Felipe Carpes, President of the Brazilian Society of Biomechanics, and Laura-Anne Furlong, Loughborough University, United Kingdom are heading the international charge. They are recruiting people to either simply have an NBD event or, for those with a bit more NBD fervor, to work as national coordinators recruiting others from their country. NBD 2017 had a tremendous number of participants from underserved populations yet we are making an even greater push to show Biomechanics to as many different groups as possible. We have a Diversity, Equity, and Inclusiveness (DE&I) group headed by Joan Bechtold, Robin Queen and others that will create DE&I initiatives incorporating NBD events. We are very excited about NBD contributing to increasing diversity in Biomechanics. NBD 2018 is making a concerted effort to incorporate the dance science world into our celebration of Biomechanics. Teal Darkenwald, East Carolina University and Antonia Zaferiou, Rush University Medical Center, Chicago are leading this initiative. This growth will further secure Biomechanics as the definitive STEAM Education field. We are science, technology, engineering, art, and mathematics more than any other discipline.

We all make NBD so successful and greater than the sum of its parts because through NBD we've created a collaborative framework within which all Biomechanists around the world enthusiastically and jointly celebrate Biomechanics. While many people host wonderful individual Biomechanics demonstrations, our combined NBD events unify international, intercontinental, and interhemispheric Biomechanics by providing a coordinated and exciting Biomechanics extravaganza. Pretty cool. Those of you new to NBD will be so surprised by the joy created through NBD participation, joy in Biomechanists, and joy in high schoolers. I am not kidding or exaggerating.

In closing, we sincerely ask you to participate in National Biomechanics Day 2018. Here's how: invite some high school students and teachers to your labs and

National Biomechanics Day, cont.

Paul DeVita

show them cool Biomechanics. It's that easy. Please register today at:
[NBD Registration](#)

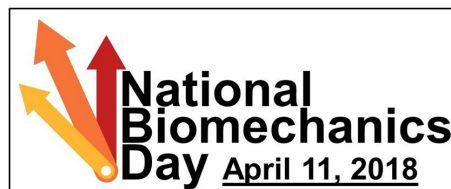
You will greatly enjoy celebrating Biomechanics with Biomechanists worldwide.

Please visit our [NBD Website](#) and see us on [Twitter](#) (@BiomechanicsDay, #NBD2018), [Facebook](#), or [Instagram](#).

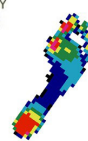
For those of you who did not see our original invitation to NBD 2018: [Here it is](#). (It's a good read - trust me.)



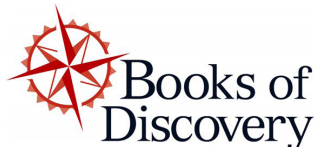
**2018 National
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**2018 National
Biomechanics
Day website**

National Biomechanics Day, cont.

Paul DeVita

The following pages contain part of the National Biomechanics Day world view with an essay about the imminent future of Biomechanics, an invitation to join NBD 2018, and a letter about the somewhat sad present state of Biomechanics.

National Biomechanics Day April 11, 2018

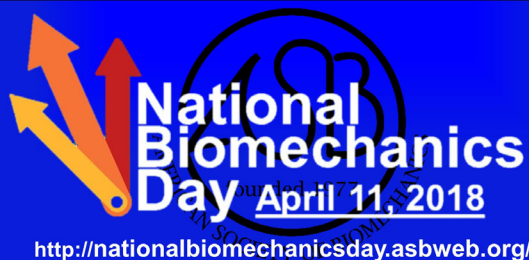


Science meets
kids...

...on National Biomechanics Day

**Celebrating the 21st
century's breakthrough
science**

**Celebrating the
21st century's
breakthrough
science**
Biomechanics is...






National Biomechanics Day

April 11, 2018

Biomechanics, The Breakthrough Science of the 21st Century




National Biomechanics Day is pushing a big idea: Biomechanics will be the breakthrough science of the 21st century. One might ask, is this possible? I think it is a distinct possibility due to several co-existing phenomena. First, Biomechanics is truly phenomenal because its scientific contributions are numerous and substantial. Biomechanists create our understanding of biology in the physical world, the physical nature of life. One could reasonably argue there is not a more valuable scientific endeavor. Second and despite this positive state-of-the-science, Biomechanics remains relatively unknown in the general population. Few people know the word Biomechanics and Biomechanics is rarely included in any list of scientific realms. The proverbial "person on the street" would not understand someone describing him or herself as a Biomechanist. In fact and amusingly, Biomechanics and Biomechanist are the only words in this essay not recognized by the spell-checker. Third, Biomechanics is beginning to appear in the non-science world. For example, young people know a bit about motion capture being the basis of video games. Biomechanical images are briefly seen in television commercials. The show "Sport Science" on ESPN highlights biomechanical analyses of athletic movements. Olympic broadcasts ever so infrequently show a multiple image analysis of diving or jumping as Biomechanists often do in the lab. In short, Biomechanics is on the edge of society's consciousness and Biomechanics' greatness can propel it past this threshold and onto a truly meaningful, valuable, and broadly appreciated position of scientific importance, relevance, and substance. The incredible contributions Biomechanics makes to the human condition will be widely recognized and prized. National Biomechanics Day celebrates the 21st century's breakthrough science with energy, verve, and joy. We are excited about the future. Paul D.

Celebrating the 21st century's breakthrough science



National Biomechanics Day
April 7, 2016

Supported by

Celebrating the 21st century's breakthrough science

Biomechanics...



...helps people

National Biomechanics Day
April 6, 2017



<http://nationalbiomechanicsday.asbweb.org/>

**National Biomechanics Day
April 11, 2018**

Science meets kids...

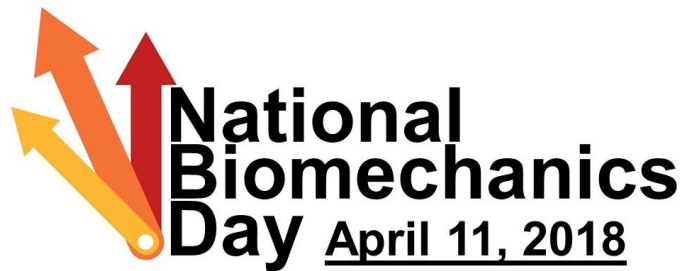


...on National Biomechanics Day

Celebrating the 21st century's breakthrough science



<http://nationalbiomechanicsday.asbweb.org/>



Please Join The Movement And The Fun That is NBD 2018



National Biomechanics Day will celebrate Biomechanics in its unique and effervescent manner for the third consecutive year in 2018. We have reached nearly 10,000 high school students in the past two years and for 2018 alone we will breakthrough with **20,000 to 30,000 students** participating in NBD and learning about Biomechanics around the world.

**We Need Everyone's Participation
To Reach Beyond Our Dreams**

Justus Ortega's description of his 2017 NBD was, "**It was awesome... and inspiring.**" But this response was thought by everyone everywhere. Our unified and synchronized celebration of all things Biomechanics creates a Biomechanics gestalt, a Biomechanics magic beyond all individual lab demonstrations. NBD is greater than the sum of its parts. Don't miss it!

NBD 2018 registration is [HERE](#)

For info: contact Paul DeVita, devitap@ecu.edu and see our website: <http://nationalbiomechanicsday.asbweb.org/>

National Biomechanics Day, You Know, Where Science Meets Fun



Biomechanics: The Breakthrough Science of the 21st Century

Dear Friends and Colleagues,

Sadly, I report to you, Biomechanics does not exist. Even sadder, it does not exist in STEM. Please see this Science Ambassador Scholarship opportunity for women in science, technology, engineering and math, [CLICK HERE](#). Seems to be a great opportunity for a young woman. If you click the FAQ link you can find a list of all the STEM fields supported by this scholarship, which I list here:

Acoustical Engineering	Computational Biology	Information Technology
Actuarial Science	Computational Mathematics	Management Science
Aeronautical and Astronautical Engineering	Computer Science	Marine Biology
Agricultural and Food Science	Computer Software Engineering	Materials Science and Engineering
Animal Behavior and Ethology	Computer Systems Engineering	Mathematics
Animation, Interactive Technology, Video Graphics and Special Effects	Conservation Biology	Mechanical Engineering
Applied Mathematics	Data Science	Medical Laboratory Science
Applied Physics	Developmental and Child Psychology	Microbiology
Archeology	Developmental Biology	Molecular Biology
Architecture	Digital Communication and Media Technology	Nanotechnology
Astronomy	Earth Science	Natural Resources Engineering
Climatology	Ecology	Naval and Marine Engineering
Atmospheric Sciences and Meteorology	Electrical Engineering	Neurobiology
Behavioral Neurobiology	Energy Systems Engineering	Neuroscience
Biochemistry	Engineering Physics	Nuclear Engineering
Bioengineering and Biomedical Engineering	Environmental Engineering	Nursing
Bioinformatics	Environmental Science	Nutrition
Biology	Environmental toxicology	Oceanography
Biomedical Science	Epidemiology	Paleontology
Biophysics	Evolutionary Biology	Parasitology
Biopsychology	Financial Mathematics	Pharmaceutical Sciences
Biostatistics	Forensic Science and Technology	Physics
Botany	Genetics	Physiology
Cell Biology	Geology	Planetary Science
Chemical Engineering	Geophysics and Seismology	Psychology
Chemistry	Human Biology	Pysiology and Medicine
Civil Engineering	Human Computer Interaction	Robotics
Cognitive Science	Hydrology and Water Resources Science	Statistics
Comptuer Hardware Engineering	Immunology	Communications and Network Engineering
	Informatics	Veterinary Science and Medicine
	Information Science	Wildlife Biology
		Zoology

Notice anything missing? Here's another list of 457 STEM degree fields: [STEM Degrees](#).

National Biomechanics Day: Where Science Meets Fun

Click: [NBD Website](#)

Click: [NBD on Twitter](#)

Click: [NBD on Facebook](#)



Biomechanics: The Breakthrough Science of the 21st Century

Notice anything missing? Ok, one more, a list of 309 STEM occupations: [STEM Jobs](#). Of course we have all seen this before when trying to complete any application that requires our profession. Biomechanics is never in the list. We are profession-less.

I do not like this. We should not like this. This unfortunate, sad...and lets' face it...rotten state of affairs is the driving principle behind National Biomechanics Day. It is our mission to educate the world about Biomechanics by introducing it to high school students and teachers. Apparently, all the fabulous, world-changing Biomechanics that our predecessors and we have done the past 100 years was not sufficient to change the world. We must STEP UP and DO IT OURSELVES. It is time to show the world that Biomechanics is fundamentally important to society's well-being and that Biomechanics can enhance our well-being at astonishing rates. For a brief time we have to pause doing Biomechanics and we have to show Biomechanics.

I ask you with all sincerity and humility to join National Biomechanics Day, to change the world through your own skill, passion and love of Biomechanics.

**Biomechanics will be the breakthrough science of the 21st century.
All we have to do is make it so.**

Please join here: [NBD 2018 Registration](#)

Please remember, while NBD 2018 is officially April 11, you can hold your event any Spring day that works for you.

Please share this letter with...everyone.

Thank you very much,

Paul DeVita, Ph.D.

Past President, American Society of Biomechanics



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National Biomechanics Day: Where Science Meets Fun

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Celebrating the 21st Century's Breakthrough Science

Celebrating the 21st century's breakthrough science



National Biomechanics Day
April 11, 2018

<http://nationalbiomechanicsday.asbweb.org/>

Celebrating the 21st Century's Breakthrough Science



National Biomechanics Day
April 11, 2018

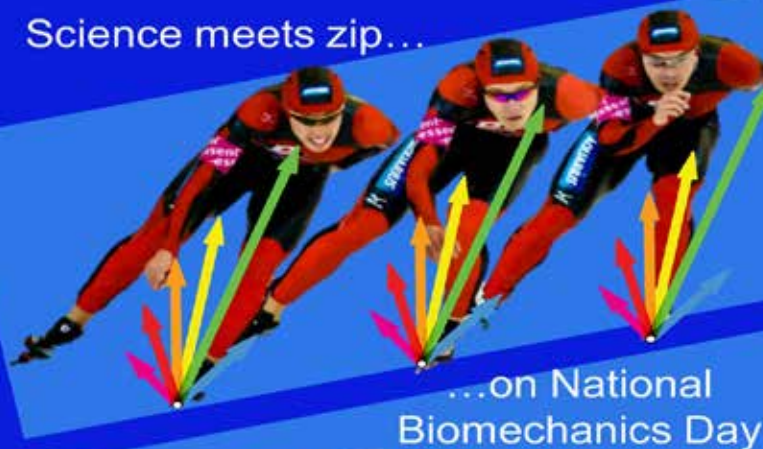
founded 1977
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Image by Xsens

Celebrating the 21st century's breakthrough science

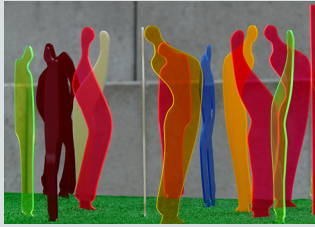
Science meets zip...



National Biomechanics Day
April 11, 2018

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2018 Annual meeting [website](#)

Program Chair

Sylvia Blemker



Happy 2018 fellow ASB members! Our 42nd Annual Meeting will be held August 8-11 in Rochester, MN. That means that, as of January 1, we were 222 days away from our next ASB meeting. This means that the meeting is not “too” far away so we are busy working hard to provide a venue for you all to highlight, share, and discuss your excellent research. Who knows, maybe the seed for the next big breakthrough in biomechanics will be planted over a napkin discussion at this year’s meeting!

We encourage the submission of high quality abstracts across the full breadth of contemporary biomechanics research, including but not limited to: muscle & bone biology; gait, posture & balance; rehabilitation engineering; ergonomics; muscle, joint & bone mechanics; prosthetics, orthotics & exoskeletons; comparative biomechanics; motor control; computational modeling and simulation; sports; teaching; as well as cellular, molecular & tissue mechanics. The program will include multiple parallel sessions, research symposia, thematic poster sessions, traditional poster sessions, lab tours, tutorials, and student-focused programming. We are pleased to announce two keynote lectures. The first speaker is Dr. Gabrielle Kardon, Professor of Genetics at the University of Utah and expert in the developmental biology of the musculoskeletal system. The second keynote lecture will be given by interdisciplinary team at the Mayo Clinic which is conducting a clinical trial for a breakthrough treatment of spinal cord injury, including Kendall Lee, M.D. (Neurosurgeon), Peter Grahn, Ph.D. (Engineer), and Kristin Zhao, Ph.D. (Biomechanist, Director of the Assistive and Restorative Technology Laboratory, and our Conference Chair).

We received several exciting proposals for the annual meeting. The goals of the symposia will be to push the envelope of our understanding of biomechanics and provide a forum for group discussion and debate.

We look forward to our annual best paper competitions (Clinical Biomechanics and Journal of Biomechanics), and the Society’s honorary awards: the Borelli Award, Jim Hay Memorial Award, Goel Award, Founders’ Award, Young Scientist Pre-doctoral Award, and Young Scientist Post-doctoral Award.

New this year will be multiple student award competitions. Abstracts submissions by students who opt-in to be considered for the award will be eligible to be considered as a finalist for one of the student award categories. We anticipate having multiple categories for the awards, including BS, MS, and PhD categories in different thematic research areas. The finalists will be selected based on the abstract reviews. All the finalists will be judged by a panel of senior members of the society, and the winners of each category will be announced at the final ceremony. If you are interested in helping select and judge the student awards, please [email](#) me.

Abstract submission is now open and abstracts will be accepted until 11:59:59 EDT on March 5, 2018. Meeting information is available through the [ASB website](#) and the [meeting website](#). Links for abstract submission may be found on the meeting website.

See you in Rochester!

Meeting Chair

Kristin Zhao

Planning for ASB 2018 is well underway and we are excited to host the 42nd Annual Meeting at the home of Mayo Clinic in Rochester, Minnesota—the “Med City”, a worldwide destination city for medical care and research. Meeting dates are August 8-11, 2018.



Rochester is easily accessible by car or air, with international airports in Rochester (15 minutes to downtown) and Minneapolis/St. Paul (1 hour and 15 minutes to downtown via shuttle and rental cars). The venue has ample parking for anyone who chooses to drive.

The conference will be held at the Mayo Civic Center in downtown Rochester. The Mayo Civic Center is recently renovated (2017), boasts a central location, and is adjacent to the Zumbro River with access to miles of hiking and biking trails.

Mayo Civic Center’s Presentation Hall will host the keynote and plenary sessions, accommodating over 1,000 people. The center’s first and second floors will be the primary site for the conference’s scientific presentations and the welcome reception.

Meeting rooms near Presentation Hall will hold up to five concurrent podium, thematic poster, or symposium sessions, each of which can accommodate up to 250 people. Additional rooms are reserved to house breakout lunch and breakfast events (including the Diversity and Women in Science events), and a speaker ready room.

The Grand Ballroom will house the posters and exhibits in over 38,500 sq. ft. of space, accommodating up to 40 exhibitors, 500 posters, dining and conversation space. As can be seen in the tentative conference schedule (page 33), eight meals and several refreshment breaks with food will be provided with conference registration to encourage additional networking and discussions between attendees.

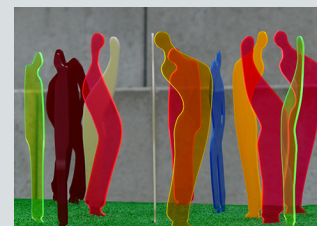
The conference banquet will take advantage of the August weather in Minnesota, and will be in the outside Peace Plaza venue.

All conference sessions will be held in rooms that are fully accessible by elevator, escalator and stairs. Lactation rooms will also be available.

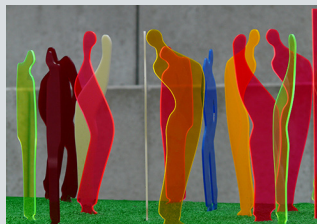
During the conference, historical Mayo Clinic and laboratory tours will be held on the Mayo Clinic campus, including laboratories in the Departments of Physiology and Biomedical Engineering, Orthopedics, Physical Medicine and Rehabilitation, among others.

Several hotel blocks for accommodations closest to the conference facility have been secured at very reasonable rates. The proximity of these guest rooms will maximize convenience and minimize travel time to the conference.

While there will be no need for attendees to leave the conference site or hotel for meals, there are dozens of locally-owned restaurants, as well as only-in-Rochester shops, located within easy walking distance of the convention. Several restaurants



**2018 Annual
meeting [website](#)**



2018 Annual meeting website

Meeting Chair, cont.

Kristin Zhao

and pubs clustered on or near downtown Rochester's Historic Third Street are popular spots for locals and visitors alike.

Social events at the conference will take advantage of the offerings in Rochester, including a "Night on the Town," which will take place during "Thursdays on First and 3rd" Summer Market & Music Festival," a weekly outdoor market of more than 100 art, craft and food vendors, and live entertainment. Musical talent is featured from 11:30 AM-1:00 PM, and 5:00 PM-7:00 PM on two stages. These events are steps away from the Mayo Civic Center and the heart of Rochester.

Sponsor and exhibitor registration is NOW OPEN. Priority for choosing booth space is based on when sponsors register; please register as early as possible to get your ideal booth location.

Abstract submission information and attendee registration will be available in early 2018 on the website.

We look forward to hosting you in the Med City next August!

	Wednesday August 8	Thursday August 9	Friday August 10	Saturday August 11	
7:00		Continental Breakfast	Continental Breakfast	5K Fun Run	7:00
7:30					7:30
8:00	Diversity Outreach	Keynote	Keynote	Continental Breakfast	8:00
8:30				Diversity Breakfast	8:30
9:00		Break	Break	Break	9:00
9:30		Podium/Thematic Posters	Podium/Thematic Posters	Podium/Thematic Posters	9:30
10:00					10:00
10:30		Break	Break	Break	10:30
11:00		Podium/Thematic Posters	Podium/Thematic Posters	Podium/Thematic Posters	11:00
11:30					11:30
12:00		Podium/Thematic Posters	Podium/Thematic Posters	Podium/Thematic Posters	12:00
12:30	Registration Opens				12:30
13:00		Lunch	Lunch	Business Meeting	13:00
13:30		ASB Career Event	Founders and Fellows/Future of ASB	Lunch	13:30
14:00	Tutorials & Lab Tours	Poster Session	Keynote - Borelli Award	Awards Session	14:00
14:30					14:30
15:00			Poster Session	Break	15:00
15:30				Podium/Thematic Posters	15:30
16:00					16:00
16:30		Women in Science Event		Closing Ceremony & Awards	16:30
17:00					17:00
17:30	Student Event			ASB Executive Board Meeting	17:30
18:00					18:00
18:30					18:30
19:00	Opening Reception	Night on the town	Banquet		19:00
20:00					20:00
20:30					20:30
21:00					21:00
21:30					21:30
22:00					22:00

Diversity Committee

Robin Queen

I am excited to begin my work as the Diversity and Inclusion Chair for the American Society of Biomechanics. The work of Kristin Zhao and the previous Diversity and Inclusion committee has positioned the ASB at the forefront of most professional societies. Their work has left our society in a position of being more supportive, inclusive, and stronger than ever in its history. During the 2017 meeting, Kristin and I worked together to plan both the Women in Science Cocktail Hour as well as the Inclusivity breakfast. Both events were highly successful thanks to the participation of the ASB membership and everyone's willingness to step outside of their comfort zone to try something new or explore topics that are often challenging to discuss. During the Women in Science Cocktail Hour participants actively engaged in 30 second interchanges on a variety of topics from describing what they loved about science to what are your biggest strengths and weaknesses. I would like to thank Jill McNitt-Gray for her leadership developing questions and hosting the event. A wonderful time was had by all in attendance. The Diversity and Inclusion committee has begun work on the 2018 Women in Science event with the goal of engaging the ASB community again in an interactive session focused on advancing women in science and leadership.



During the Inclusivity Breakfast in Boulder, we focused on strategic planning for the Society. Our goal was to identify some of the barriers to career success and identify ways in which the ASB could provide support and training to decrease or remove these barriers for our membership. From these conversations, we were able to identify three target areas on which we will focus our efforts and programming at the upcoming meetings. These three target areas include: 1) grant writing and funding opportunities—the processes, best practices, how to decide on the right mechanism, 2) how to have difficult conversations and negotiate for what you need as an underrepresented minority, and 3) best practices for maintaining a mentoring team (especially outside your department/institution). The committee is working on addressing one of these three topics during the Diversity Breakfast at the 2018 meeting through an interactive panel or workshop: more details to come through social media or annual meeting announcements. We are also planning an exciting outreach opportunity for the ASB membership during the Annual Meeting as well as proposing a symposium on outreach to potentially be presented during the meeting, so stay tuned for more details.

We also invite the membership to consider ways to emphasize diversity and inclusion in your National Biomechanics Day plans for April 11, 2018. Seek out your University's Diversity and Inclusion Committee, and request their input and partnership. Remembering to take every opportunity to weave diversity and inclusion into all events and activities (NBD and throughout the year) to begin to normalize opportunity, and to bring everyone to the table. A strategy for tracking NBD impact will be to document all students who attend, and include information on gender, ethnic and cultural affiliation, first generation college, etc. For some ideas please refer to the [Fellows Article](#) from the previous newsletter. We will work with the NBD planning committee to develop standardized reporting forms to streamline this process. Implementing outreach activities targeting specific communities, and documenting our success in reaching those communities



Diversity Committee, cont.

Robin Queen

during NBD will be useful in planning future outreach, and improving our reach. We look forward to hearing about and publicizing your approaches and their success. Please also consider using social media and other outlets to publicize your events and your student recruitment strategies.

I would like to take this opportunity to thank the members of the Diversity Committee (Matt McCullough: NC A&T State University; Joan Bechtold: University of Minnesota; Susan Diekrager: Novel Electronics; and Ajit Chaudhari: The Ohio State University) for all of their hard work and insights as we have been planning Diversity and Inclusion programming for the 2018 Annual Meeting. Please feel free to reach out to any member of the committee or me at any time with suggestions or concerns during the year as well as throughout the 2018 Annual Meeting.

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President-elect

Brian Umberger

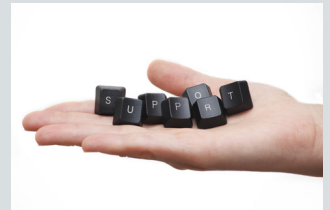


One of the primary responsibilities of the President-Elect is to solicit bids to host future ASB Annual Meetings. The 2018 meeting will be hosted by Kristin Zhao and her team at the Mayo Clinic in Rochester, MN and the 2019 meeting will be held in conjunction with the XXVII Congress of the International Society of Biomechanics at the University of Calgary. Looking further down the road, the 2022 meeting will be held jointly with the Canadian Society for Biomechanics as part of the Fifth North American Congress on Biomechanics (NACOB). Thus, the Society is seeking hosts for the 2020 and 2021 ASB Annual Meetings. Planning for an annual meeting is a long-term prospect and parties interested in hosting a future ASB meeting are always encouraged to contact the President-Elect for more information on how to prepare a bid.

As most of you know, our immediate past Program Chair, Steve Piazza, initiated an extensive discussion on Biomch-I regarding how we should deal with the growth of the ASB meeting from a programmatic standpoint. Information from this discussion, as well as from the post-meeting survey and other sources, will directly factor into program planning for future annual meetings. Here, I would like to suggest that there should also be consideration of how our meetings are planned, organized, and run from a logistical perspective (i.e., from the view of the Meeting Chair). While there certainly have been changes over time in how the logistics of the annual meetings are handled, the current process is not that different from the days when the meeting regularly attracted 250-300 people. For context, there were 994 registrants at the recent meeting in Boulder. One way to handle the greater size of the meeting is to rely more on professional conference services.

Having some sense of what goes into hosting the ASB Annual Meeting (though from observation, not first-hand experience), I am impressed at how successful the recent meetings have been as the number of attendees has continued to rise. That success is a testament to the dedication, not to mention organizational skills, of our recent Meeting Chairs and their teams. Given that there are no signs ASB meetings will get smaller in the future, it seems reasonable to turn more of the responsibilities of hosting the meetings over to professionals. For example, our Past-President, Chris Hass, used the services of a site selection company for the first time two years ago and I am currently working with that same company. They provide screening of venues in possible host cities that are a good fit with the ASB meeting, saving potential local hosts considerable legwork. There are similar professionals whose services cover all aspects of conference hosting, from budget management to staffing the registration desk. One option I believe the Society should consider for the Annual Meetings following the upcoming NACOB (2023 and on) is to rely on conference professionals for all but the scientific and professional (e.g., mentoring, networking, outreach) aspects of the meeting.

Two possible concerns with such an approach would be a greater cost to attend the meeting and losing the feel of a traditional ASB meeting. Based on initial discussions with people in the conference planning industry I am confident that having the meetings planned and the logistics handled by a professional conference service does not need to mean an increase in cost. There are many opportu-



ASB Corporate Sponsors 2016

Corporate sponsor levels are aimed at encouraging affiliation by commercial organizations that market products which are used by the biomechanics research community, or companies that are otherwise engaged in activities that fall within the Society's general interest areas. Companies wishing to become a Corporate Member are encouraged to contact [Tamara Bush](#), Treasurer.

The ASB Executive Board is pleased to recognize the following corporate sponsors:

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President-elect, cont.

Brian Umberger

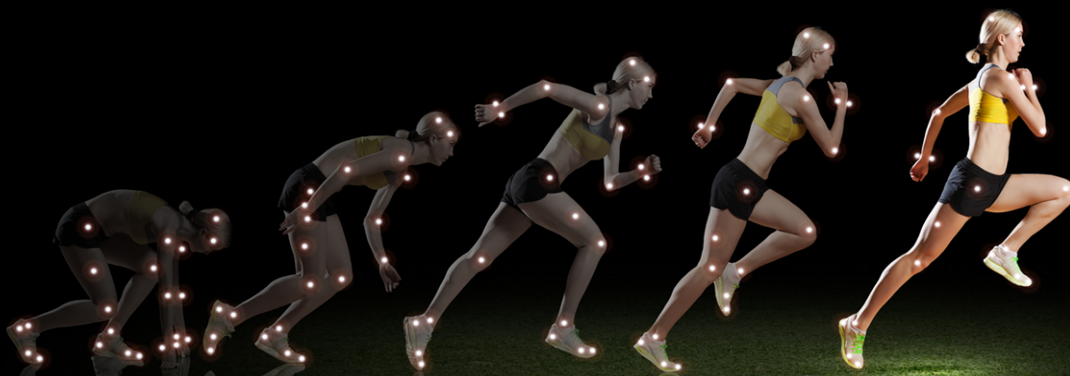
nities for cost savings known to conference industry insiders that the average ASB member who is hosting a meeting may not be aware of, or cannot take advantage of because each meeting is booked as an independent event, financially unrelated to preceding or subsequent meetings. Regarding the feel of the meeting, maintaining the elements that make an ASB meeting special will require specific attention if there is a greater level of involvement by conference professionals. I know how difficult it was to retain any semblance of an ASB feel when I was Program Chair for the joint meeting with the World Congress of Biomechanics in 2014, so I am especially sensitive to this issue.

Even if we rely more heavily on conference professionals in the future to handle meeting logistics, we will still need a Meeting Chair who is directly involved in the planning and organization process to ensure that the meeting remains what we want it to be. What would change are some of the specific responsibilities of the Meeting Chair, relative to what they are today. I welcome any thoughts people have on these issue and I anticipate further opportunities to consider them in the future. I will close by noting that if dealing with the increased size of the ASB Annual Meeting is a problem, it is a good problem for us to have. Biomechanics is experiencing a period of growth and enhanced recognition, and with the success of outreach efforts such as National Biomechanics Day there is no reason to believe that will change any time soon.

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Umbrellas are for Tourists

William Ledoux

Hello from the Emerald City! This edition of the ASB newsletter contains the usual contributions from our President, Student Representative, Secretary, Treasurer, and Education Committee. Roger Enoka also contributes an interesting article on how to best describe muscle action. The summary of the awards offered by the ASB reflects the recent changes related to the Jim Hay Memorial Award, the Founders' Award, and the Goel Award for Translational Research in Biomechanics. Highlights from the ASB facebook page as well as a collage of pictures from last summer's meeting in Boulder are included. We hear from the Communications and Diversity Committees, and Paul DeVita previews all the exciting news related to the National Biomechanics Day 2018. The program and meeting chairs discuss the plans for the 2018 ASB meeting at the Mayo Clinic, and our President-Elect reviews how future ASB meetings might be organized. We describe how the ASB had a booth at the Annual Biomedical Research Conference for Minority Students and present the updated calendar of events. From the ASB archives, we share the "Minutes of a Meeting to Consider the Founding of an American Society of Biomechanics". One nugget that I found near the end is the proposed name of the "United States Society of Biomechanics" which sounds incredibly odd to my ear. Thanks to all the Executive Board and other society members who contributed to the newsletter.

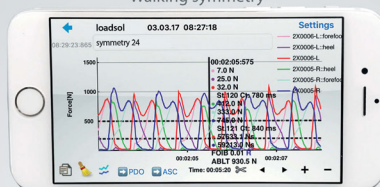


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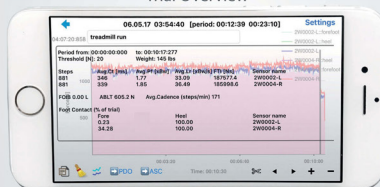


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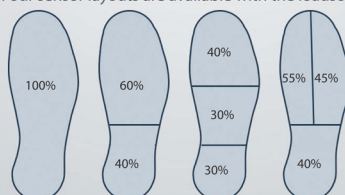
Walking symmetry



Trial Overview



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Minutes of a Meeting to Consider the Founding of
an American Society of Biomechanics held in
Jyväskylä, Finland, on July 2, 1975

Present: Dr. Gideon Ariel, Dr. John Cooper, Dr. Albert Craig, Mr. Dan Daly, Dr. Jim Emory, Dr. Gladys Garrett, Dr. James Hay (Chairman), Dr. Robert Jensen, Dr. David Kaufmann, Dr. David Kelley, Dr. Menaheim Less, Dr. Doris Miller, Dr. Richard Nelson, Ms. Carol Putnam, Mr. Donald Riley, Dr. Jacques Samson, Dr. Gary Soderberg (Secretary), Dr. Juris Terauds, Dr. Barry Thompson, Dr. Erwin Tichauer, Dr. Ed Tucker, Mr. Barry Wilson.

Dr. Hay provided introductory remarks thanking all those present for their attendance. He explained that the calling of the meeting resulted from a series of informal discussions over several years that had culminated in a specific discussion at the Spring Meeting of the American College of Sports Medicine. At that time it was decided that there was a need for more broad discussion of the pros and cons of forming an American Society of Biomechanics. As a result, letters regarding this present meeting had been sent to all U.S. preregistrants for the Vth International Congress.

Dr. Hay then outlined what he considered to be some of the pros and cons of forming such an organization. He stated that although there was much biomechanics activity in many areas, there was relatively little contact among people in biomechanics. He expressed the view that there was a need for a common forum which, while not intended to replace any existing group or meeting, would provide for exchange across fields of application. He stated that he suspected that those who work in other areas would similarly not be enthused about another group which simply replicated what was already available. Among the cons, Dr. Hay noted that there were already numerous conferences and that much organizational work would be involved.

Dr. Hay then called for a reaction to the question of whether or not to initiate steps toward the formation of an association.

Dr. Tichauer responded very positively, citing the need for communications. He stated that there was no biomechanic's-biomechanics group per se, but rather a conglomeration of many different professional groups. He also felt a need for a newsletter or journal.

Dr. Cooper suggested the possibility of forming a North American group, or in other words combining with the recently founded Canadian Society. He also indicated that dollars would be needed and that we should perhaps consider formation within the American College of Sports Medicine and offer a simultaneous program.

In reply to Dr. Cooper, Dr. Hay stated that identification with the American College of Sports Medicine might seriously limit the scope of an American or North American Society of Biomechanics.

Dr. Kelley asked whether the proposed society would seek affiliation with the International Society of Biomechanics.

Dr. Hay said he would expect such a step to be taken eventually.

Dr. Jensen indicated that the Canadian group was applying for affiliate membership.

Dr. Kelley stated that he favors the formation of a society, that he sees no problem with redundancy and that the possibility of forming an American College of Biomechanics should be considered. He did not see that any other organization met the needs of this particular group.

Dr. Hay reported that he had received positive letters of response from the following six people:

Dr. David Barlow, Physical Education, University of Delaware
Dr. Barry Bates, Physical Education, University of Oregon
Dr. Pat Downie, Physical Education, Smith College
Dr. Erwin Tichauer, Ergonomics, New York University
Dr. Joseph Vorro, Dentistry, University of Maryland
Mr. James Walton, Applied Mechanics, Stanford University

Dr. Tichauer suggested that perhaps the National Science Foundation would have seed money for establishment of this organization.

Dr. Cooper too suggested that perhaps we should seek a modest beginning with attachment to some other group.

Dr. Kelley responded by citing that in his opinion numbers were available and that they would more likely favor a separate group.

Dr. Hay questioned whether a negative effect would be felt by being attached to another group.

Dr. Tichauer responded by saying that it would, and that he would therefore favor some kind of neutral ground.

Dr. Terauds moved to form a United States Society of Biomechanics, subject to name change, as per the suggestions of an organizational committee. Dr. Kelley seconded and the motion passed unanimously.

The meeting then proceeded to identify groups or agencies with which biomechanics people were active. The following were listed:

Alliance for Engineering in Medicine and Biology
American Alliance for Health, Physical Education and Recreation
American Association for Medical Instrumentation
American College of Sports Medicine
American Congress of Rehabilitation Medicine
American Industrial Hygiene Association
American Institute of Electrical Engineers

July 2, 1975

Minutes, American Society of Biomechanics
page 3

American Physical Therapy Association
American Society of Mechanical Engineers
International Society of Behavioral Kinesiology
International Society of Electrophysiological Kinesiology
Orthopedics Research Society

Discussion was then held on possible persons to participate in the formation of a working committee that would represent engineering, sport, and medicine. The following names were suggested:

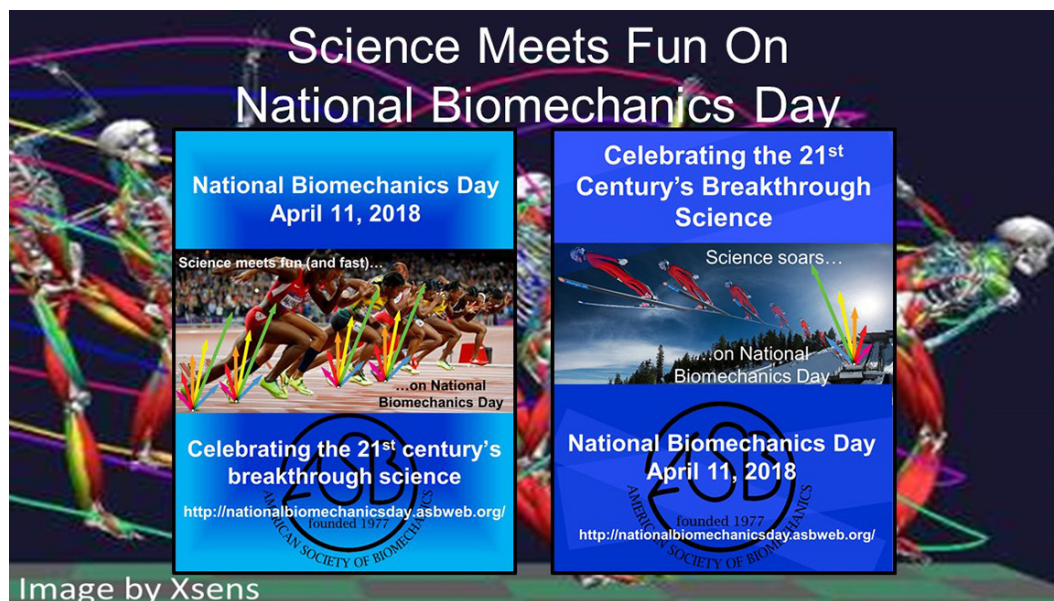
Dr. John Basmajian (Medicine)
Dr. Bernacki (Clinical Medicine)
Dr. Don Chaffin (Engineering)
Dr. John Cooper (Physical Education)
Dr. James Hay (Physical Education)
Dr. Tom Kane (Engineering)
Dr. David Kaufmann (Physical Education)
Dr. Wasserman (Engineering)

Dr. Miller moved that Dr. Hay be elected as Chairman pro-tem, Dr. Kelley seconded, and the motion carried. Dr. Hay was instructed to proceed with the organization of a working committee, and after some discussion on procedure, Dr. Terauds moved to give responsibility for formulation to Dr. Hay with considerable leeway as to individuals that he might contact.

Following the appointment of Dr. Soderberg as interim secretary, the meeting was adjourned.

Respectfully submitted,

Gary Soderberg
Interim Secretary



Annual Biomedical Research Conference for Minority Students (ABRCMS)

This past November, ASB participated in the Annual Biomedical Research Conference for Minority Students (ABRCMS) in beautiful Phoenix, AZ. ASB member James Finley and Past-President Chris Hass joined one of the largest and most prestigious conferences for underrepresented minorities in science, technology, engineering, and mathematics to share the mission and impact of ASB. Our participation highlights ASB's commitment to inclusivity and the development of a diverse generation of scientists. During the four-day conference, over 2500 undergraduate, postbaccalaureate, and graduate students as well as postdoctoral scientists participated in poster, oral presentations, and professional development sessions. In an ASB sponsored exhibitor booth James and Chris shared information about opportunities in the field of biomechanics, ASB related biomechanics graduate programs, and provided professional development advice. Further, attendees participated in live demos of IMU motion capture technologies.





Events Calendar

Dan Gales



NOTE:

For other listings of international conferences, please visit either the ISB's [web-site](#) or [Biomch-L](#).

Orthopaedic Research Society Annual Meeting 2018

March 10-13, 2018
New Orleans, Louisiana, USA
Abstract deadline: past
www.ors.org/2018annualmeeting

National Biomechanics Day

April 11, 2018
nationalbiomechanicsday.asbweb.org

Third Annual Conference in Human Movement Variability

May 17, 2018
Omaha, NE
Abstract Deadline: January 29, 2018
tinyurl.com/yctbpy3m

Gait and Clinical Movement Analysis Society

May 22-25, 2018
Indianapolis, Indiana, USA
Abstract deadline: past
www.gcmas.org/2018_annual_conference

Fifteenth International Symposium on the 3-D Analysis of Human Movement

July 3-6, 2018
Salford, United Kingdom
Abstract deadline: January 26, 2018
tinyurl.com/ydy8xd9r

23rd European College of Sport Science

July 4-7, 2018
Dublin, Ireland
Abstract deadline: February 15, 2018
ecss-congress.eu/2018/18/index.php

2018 World Congress of Biomechanics

July 8-12, 2018
Dublin, Ireland
Abstract deadline: past
wcb2018.com

American Society of Biomechanics 42nd Annual Conference

August 8-11, 2018
Rochester, Minnesota USA
Abstract deadline: early March, 2018
asb2018.asbweb.org

36th International Society of Biomechanics in Sport

September 10-14, 2018
Auckland, New Zealand
Abstract deadline: March 26, 2018
isbs.org/isbs-2018

American Physical Therapy Association NEXT Conference and Exposition

June 27-30, 2018
Orlando, Florida USA
Abstract deadline: past
www.apta.org/NEXT/

Human Factors and Ergonomics Society

International Annual Meeting
October 1-5, 2018
Philadelphia, Pennsylvania
Abstract deadline: February 12, 2018
tinyurl.com/y8whqtnw

International Society of Biomechanics 2019 Congress XXVII

July 31-August 4, 2019
Calgary, Alberta, Canada
Abstract deadline: TBD
www.isb2019.com

ASB2018

AMERICAN SOCIETY OF BIOMECHANICS ANNUAL MEETING

AT MAYO CLINIC

ROCHESTER, MINNESOTA
AUGUST 8-11



asb2018.asbweb.org