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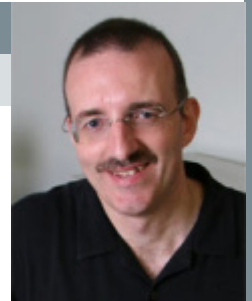
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## Newsletter

Volume: 26 - Number: 1, June 2013

### From the President

John H. Challis



The majority of the organization for the [2013 ASB Conference](#) is complete. The Program Chair (Rakié Cham) and the Meeting Chair (Nick Stergiou), and their teams should be complimented on their efforts. The Executive Board visited Omaha earlier in the year and saw the conference venue; it will suit our needs very well. Over the years our annual conference has continued to grow in terms of the number of presentations, and number of delegates. While web conferencing and or webinars are popular, they do not seem to be displacing the traditional conference. In contrast, electronic options for publishing are having a larger impact on the dissemination of research findings.

The first scientific journal was published in 1665, and alongside conferences, journals have been the major medium for the dissemination of research findings. In 2010 it was estimated that there had been 50 million scholarly articles published. Over the last 20 years journals in the field of biomechanics have published more papers per year. We have a proliferation of literature to read, and opportunities for publishing our own research. With papers published electronically our ability to track down and read the literature is becoming easier, some would say overwhelming.

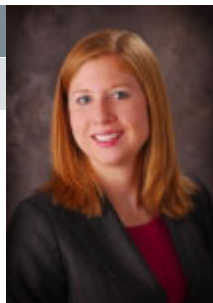
Although a visit to the library can have rewards beyond tracking down key papers, most researchers sit at their desk and scan the literature electronically. Prior to the introduction of PubMed in 1996 searching the literature was a more complicated task, and while in 1996 it was feasible to electronically identify a paper, a trip to the library was required to obtain a copy of the paper. Now as we sit at our desks, with luck we can get direct access to an electronic version of the paper. The luck depends on the available access to the journal. Some journals are freely available on-line, and others may be available due to an institutional subscription. This access to papers may be about to undergo a significant change.

In the United Kingdom, much of the funding for university research is administered by Research Councils UK. In April of this year they mandated that the research that they fund should be published in journals that make the work freely available. In theory, the taxpayers paying for the work will be able to read the results of their investment. In practice, how many taxpayers will be motivated to read such research remains to be seen, and of course much scientific literature is arcane. The European Union is also exploring such options. In the US The White House Office of Science and Technology Policy has instructed federal agencies to develop a similar system.

**Continued on page 3...**

# Student's Corner

Jennifer Bagwell



It is almost officially summer which means barbeques, vacations, and, of course, early registration for the ASB annual meeting. The meeting this year will be held in Omaha, Nebraska from September 4-7, 2013. The National Institutes of Health (NIBIB and NIAMS) have provided funds to offset student registration costs. These funds will allow for partial or even full refunds of student registration fees. Refunds will be based on disability status, ethnicity, and gender in line with NIH guidelines for funding underserved populations. Students that do not fit the underserved population definition are still encouraged to register early, as there may be monies left over after all underserved students are refunded. However, only students who register by July 5th, 2013 will be considered for this refund, so if you have not registered yet, now is the time! Specific questions can be directed to Amanda Fletcher at [alfletcher@unomaha.edu](mailto:alfletcher@unomaha.edu).

For those who are attending the annual conference, a great way to enrich your conference experience is to enroll in the ASB one-on-one student mentoring program. This program is designed to allow students to network with more senior scientists. Students will be paired with a mentor based on shared research interests. The mentor and student can discuss educational and career objectives over lunch or dinner at a time that is convenient for both parties. I will be emailing the student membership soon regarding participation!

Another great way for students to enhance their meeting experience is by attending the student event on Wednesday September 4th. This event will include three short presentations followed by time for one-on-one or small group interaction with the presenters. The themes for this year's presentations will be pursuing a career in clinical research, careers in industry, and how to search for and secure a faculty position. Whether you have specific questions regarding these topics or you are interested in an opportunity to interact with these scientists and your fellow students, attend this event on the opening day of the conference!

By the second night of the conference everyone will be ready for a little relaxation, so come enjoy the company of your fellow students, and maybe a libation or two, at The Old Mattress Factory on Thursday September 5th. Other events of interest to students include the Diversity Luncheon and the Women in Science Breakfast. The Diversity Luncheon will take place on Thursday September 5th. This is an opportunity to discuss the role of diversity within ASB as well as potential methods for outreach locally and globally. This event will likely feature a short presentation followed by roundtable discussions regarding the role of diversity in ASB today and into the future. The Women in Science Breakfast will be held Friday September 6th at the Hilton hotel. This is an opportunity to hear leading women scientists discuss their experiences and will be followed by roundtable discussions and time for networking with other women scientists.

Lastly, I would like to thank the newly elected ASB student advisory committee. Congratulations to Rumit Singh Kakar, Nadine Lippa, John Looft, and Doug Renshaw for being selected to serve. This committee facilitates communication between the ASB executive board and student members. Any suggestions for the student advisory committee or the annual meeting student activities can be directed to me at [petersjj@usc.edu](mailto:petersjj@usc.edu). I look forward to seeing you in Omaha!



## Editorial Board

Editor & Layout

**William Ledoux**

[wrledoux@u.washington.edu](mailto:wrledoux@u.washington.edu)

Calendar & Advertising

**Dan Gales**

[DGales@lhup.edu](mailto:DGales@lhup.edu)

## Advertising in the Newsletter

The Editorial Board invites businesses that have products or services of interest to members of the Society to advertise in the ASB Newsletter. Advertising space may also be purchased for job postings or other special announcements.

The current advertising rates are as follows:

1/4 page--\$100

1/2 page--\$200

full page--\$400

back page--\$600

If you are interested in learning more about advertising in the ASB newsletter, please e-mail Dan Gales:

[DGales@lhup.edu](mailto:DGales@lhup.edu)



## ASB Involvement

If you are interested in becoming more active in the Society (e.g., serving on a committee or chairing a conference session), contact [Andrew Karduna](#), 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.)

**John H. Challis**

There has been a proliferation of electronic journals, many of which make their papers freely available. One such journal is PLoS ONE, which when first published in 2006 had just 138 articles in the year, but by 2012 that number had risen to over 23,000 in a year. For this journal the contents are freely available but the authors have to pay a charge for publication. A quick search finds over 1,300 papers in PLoS ONE with some biomechanics emphasis. For the general public such a publication model works well, as papers are free. For a researcher, targeting such journals can be problematic due to the publication charge (although for PLoS ONE this can be waived). Alternatives are also emerging, non-commercial open-access journals supported by funding agencies. For example, the recently launched eLife has no publication charges and is supported by the Howard Hughes Medical Institute, Max Planck Society, and Wellcome Trust. These developments are all relatively new when one considers that the journal [Philosophical Transactions of the Royal Society](#) has been published for nearly 350 years.

The nature of academic publishing is changing and where it will end is hard to predict. An interesting parallel comes from the world of recorded music. For most of the 20th Century the preferred medium was the record. By the early 1990's this medium had been usurped by the CD, which had many benefits over records but had to be handled with care. By the 2000's the sales of music CDs started to drop to be replaced by MP3 format music, downloaded from various on-line sites. The majority of music is now bought on-line and stored in digital format. This history of academic publishing is longer but is now experiencing the same rapid changes. In the mid-1990s would many have predicted the demise of the CD, and dominance of the MP3? Probably not, and predictions about academic publishing are similarly hard to make.

I look forward to seeing many of you in Omaha, but in the meantime if you have any comments about the activities of the ASB please feel free to email me ([jhc10@psu.edu](mailto:jhc10@psu.edu)).

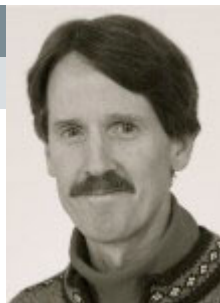
*"Technological change is discontinuous. The monks in their scriptoria did not invent the printing press, horse breeders did not invent the motorcar, and the music industry did not invent the iPod or launch iTunes. Early in the new century book publishers, confined within their history and outflanked by unencumbered digital innovators, missed yet another critical opportunity, seized once again by Amazon, this time to build their own universal digital catalog, serving e-book users directly and on their own terms while collecting the names, e-mail addresses, and preferences of their customers. This strategic error will have large consequences."*

**- Jason Epstein**



# Education Committee

## Gerald Smith



With the end of Spring, the ASB regional conference season has finished for 2013. Both the South Central and Rocky Mountain regional meetings were held in mid-April this year while the Northwest meeting was completed on June 1. Organizers of the regional conferences have all aimed for student centered gatherings which provided opportunities for students to network, meet potential collaborators, polish presentation skills, and be challenged by speakers from outside the region.

We wish to thank all of the organizers of these regional conferences for their efforts and to the various institutional and commercial sponsors that helped make these possible. ASB has funded recent regional conferences with \$2000 each to help defray some of the organizational expenses. However, most regional conferences do require some additional support to allow student attendance at minimal cost. We encourage those who are planning on submitting a regional conference proposal to obtain some additional institutional and vendor support. Proposals for ASB support are due each year at the end of September. These are to be sent to the ASB Education Chair and will be evaluated by the ASB executive board.

Special thanks to the following ASB members who provided the energy and time to make each of the regional conferences a success:

### **Rocky Mountain regional meeting (see page 12):**

Anne Silverman (Colorado School of Mines); Bradley Davidson (University of Denver); Alaa Ahmed (University of Colorado, Boulder)

### **South Central regional meeting (see page 12):**

Sharon Wang (Texas Woman's University - Dallas); Elaine Jackson (Texas Woman's University - Dallas); Fan Gao (University of Texas Southwestern Medical Center)

### **Northwest Biomechanics Symposium (see page 13):**

Anita Vasavada (Washington State University); David Lin (Washington State University); Craig McGowan (University of Idaho)

Seventeen graduate students submitted research proposals for the ASB Grant-in-Aid (GIA) program this year. These came from a wide variety of institutions and reflected the breadth of interests seen in the ASB membership overall. Evaluating the proposals and then narrowing the selection to five award winners proved to be a particularly challenging task as the pool of submitted projects was quite strong. We would like to thank all the students who submitted a proposal and regret that not all could receive funding.

Congratulations to the graduate students who were nominated by the evaluation committee and confirmed by the ASB executive committee to receive a \$2000 GIA award for 2013-2014 (see page 24). We expect some excellent research presentations from this group in the years to come. ASB commends these outstanding graduate students and also gives special thanks to the evaluation committee (Ajit Chaudhari, Saryn Goldberg, Bradley Davidson, and Zachary Domire) for the considerable time they put into the careful review of the GIA applications.



## **ASB Executive Board 2012-13**

### **President**

John Challis, PhD  
Pennsylvania State University  
University Park, PA 16802  
Phone: (814) 863-3675  
[jhc10@psu.edu](mailto:jhc10@psu.edu)

### **President-Elect**

Richard Hughes, PhD  
University of Michigan  
Ann Arbor, MI  
Phone: (734) 474-2459  
[rehughes@umich.edu](mailto:rehughes@umich.edu)

### **Past-President**

Don Anderson, PhD  
University of Iowa  
Iowa City, IA 52242  
Phone: (319) 335-8135  
[don-anderson@uiowa.edu](mailto:don-anderson@uiowa.edu)

### **Treasurer**

Gary Heise, PhD  
University of Northern Colorado  
Greeley, CO 80639  
Phone: (970) 351-1738  
[gary.heise@unco.edu](mailto:gary.heise@unco.edu)

### **Treasurer-Elect**

Karen Troy, PhD  
University of Illinois at Chicago  
Chicago, IL 60612  
Phone: (970) 351-1738  
[klreed@uic.edu](mailto:klreed@uic.edu)



## ASB Executive Board 2012-13

### Secretary/ Membership Chair

Andrew Karduna, PhD  
University of Oregon  
Eugene, OR 97403  
Phone: (541) 346-0438  
[karduna@uoregon.edu](mailto:karduna@uoregon.edu)

### Program Chair

Rakié Cham, PhD  
University of Pittsburgh  
Pittsburgh, PA 15219  
Phone: (412) 624-7227  
[rham@pitt.edu](mailto:rham@pitt.edu)

### Program Chair-Elect

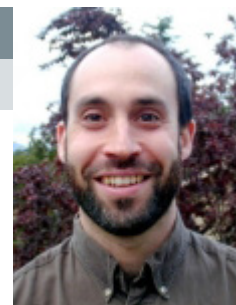
Brian Umberger, PhD  
University of Massachusetts  
Amherst, MA 01003  
Phone: (413) 545-1436  
[umberger@kin.umass.edu](mailto:umberger@kin.umass.edu)

### Meeting Chair

Nick Stergiou, PhD  
University of Nebraska at Omaha  
Omaha, NE 68182  
Phone: (402) 554-3247  
[nstergiou@unomaha.edu](mailto:nstergiou@unomaha.edu)

# Secretary/Membership

**Andrew Karduna**



Numbers, Names and News.

Let's start with some numbers:

- 9 Emeritus Members (welcome Steve Goldstein).
- 332 Regular Members
- 164 Student Members

However, we also have lots of folks who have not renewed their membership for 2013:

- 140 Regular Members
- 170 Student Members

If you are in this category, please go to [www.asbmem.org](http://www.asbmem.org) to renew your membership. Do it now. Please.

Now with some names:

- Tong-Ching Tom Wu, Bridgewater State University
- Chris Hass, University of Florida
- Young-Hui Chang, Georgia Institute of Technology

This is the membership committee and we have been having some good conversations about the membership application process. More later.

And news:

Since the annual meeting is in September this year, look for elections to occur in July. We'll be electing a new president and program chair. The candidates are:

President:

Francisco Valero-Cuevas  
Darryl Thelen

Program Chair:

Margaret Finley  
Rick Neptune

Not much else to report, so I will leave you with the message I received from a representative from Disney who had a question about ASB:

Have a magical day!

*"I sent the club a wire stating, 'Please accept my resignation. I don't want to belong to any club that will accept me as a member.'"*

**- Groucho Marx**

Editor's note: This is a recycled quote from last newsletter (which I promised myself I would not do), but it is apparently the only quote about membership that exists online.

# Treasurer

**Gary Heise and Karen Troy**

My distinguished predecessor, Paul DeVita, told me of one simple goal to keep in mind as ASB Treasurer, “whatever you do, stay out of jail.” I’ve heeded Paul’s advice over the last few years and (knock on wood) will accomplish that goal as my term comes to a close at this year’s annual meeting in Omaha, NE. I want to take this opportunity to update our finances and thank a few individuals. Then you can meet Karen Troy, our new ASB Treasurer.



Let’s talk finances. Due to the recovering economy as well as the overwhelming SUCCESS of our annual meetings during my term as treasurer, our finances are in good shape. If you want details of those finances, please attend the ASB Business meeting in Omaha (shameless plug), but here are a few highlights. Our long-term investments have improved because the stock market has improved. The only investment we made into a long-term account is the fund devoted to Jim Hay’s memory and the award in his name. From the society’s overall income, the executive board (XB) agreed to match member donations to this account last year and as of March 31, 2013 this account held \$17,853. The other long-term accounts, which were allowed to recover the past three years, total approximately \$150,000. In the near future, Karen and the XB will examine our portfolio and the allocation that best suits our needs.

The society furnishes awards at the annual meeting (e.g., Borelli, Hay, Pre-Doc, Post-Doc), travel awards to students attending the meeting, regional meetings throughout the country and Grant-in-Aid awards. Last year, we spent approximately \$20,000 in those three categories. Operating costs include web-based expenses (e.g., credit card processing, database operation), XB mid-year meeting, bookkeeping and tax-prep services, and general office-related supplies.

Although the members of the XB serve as volunteers, we do employ a few folks on an “as-needed” basis. This is where I would like to direct a couple of thanks. Brenda Bowen is a capable and trustworthy bookkeeper in Greeley, Colorado and has kept our financial books in tip-top shape over the past three years. She has done an outstanding job, and most importantly, she has kept Paul’s “one simple goal” in mind (see top sentence of this column). In addition, we still employ the services of Tom Pope and his accounting firm in Lexington, KY for tax preparation (thanks to Rob Shapiro for that connection). The federal government recognizes us as a tax-exempt organization and I am happy to report that we have NOT come under extra scrutiny like some other organizations (Google “2013 IRS scandal” for some fun reading across the political spectrum).

From Karen: Gary and I have been working together over the past year to get me up to speed on all of the operational details of being Treasurer, and I am looking forward to officially taking the position at our Annual Meeting. My goal for the next three years is for everyone to smile when they see me (because I’ll be the one handing out the checks), and at a minimum, not to screw it up. (I learned when I had children to set low expectations for myself). See you all in Omaha!



## **ASB Executive Board 2012-13**

### **Education Committee Chair**

Gerald Smith, PhD  
Colorado Mesa University  
Grand Junction, CO 81501  
Phone: (970) 248-1918  
[geasmith@coloradomesa.edu](mailto:geasmith@coloradomesa.edu)

### **Communications Committee Chair**

Michelle Sabick, PhD  
Boise State University  
Boise, ID 83725-2085  
Phone: (208) 426-5653  
[msabick@boisestate.edu](mailto:msabick@boisestate.edu)

### **Newsletter Editor**

William Ledoux, PhD  
VA Puget Sound  
Seattle, WA 98108  
Phone: (206) 768-5347  
[wrledoux@u.washington.edu](mailto:wrledoux@u.washington.edu)

### **Student Representative**

Jennifer Bagwell, PT, DPT  
University of Southern California  
Los Angeles, CA 90089  
Phone: (323) 442-2089  
[petersjj@usc.edu](mailto:petersjj@usc.edu)



## 2013 Award Summary

### Borelli Award

Kenton Kaufman,  
Mayo Clinic

### Jim Hay Memorial Award

Glenn Fleisig,  
American Sports Medicine  
Institute

### Pre-Doctoral Young Investigator

Arin Ellingson,  
University of Minnesota

### Post-Doctoral Young Investigator Award

Steve Collins,  
Carnegie Mellon University

### Journal of Biomechanics Award Finalists

Peter Barrance,  
Kessler Foundation Research Center

Michelle Hall,  
The University of Melbourne

### Clinical Biomechanics Award Finalists

Joseph Geissler,  
New Jersey Medical School  
and New Jersey Institute of  
Technology

Hunter Bennett,  
East Carolina University

## Past-President

### Don Anderson



As Past President, I have the pleasure and responsibility of coordinating ASB awards. I would like to thank the more than 100 ASB members who have taken part in the award application and review process. We very much appreciate your valuable contributions to the field of biomechanics. We look forward to learning the outcome of awards yet to be decided at the annual meeting in Omaha. These include the 2013 President's award, Journal of Biomechanics award, and the Clinical Biomechanics award. In closing, it has been my honor and pleasure to serve the membership of the American Society of Biomechanics.

### 2013 Borelli Award Winner: Kenton Kaufman

Dr. Ken Kaufman obtained his PhD from North Dakota State University in 1988. After a time at Children's Hospital in San Diego, he joined the faculty at the Mayo Clinic in 1996, where he is now the W. Hall Wendel, Jr. Musculoskeletal Research Professor and Director of the Orthopedic Biomechanics / Motion Analysis Laboratory.

Ken has made outstanding contributions in orthopedics, rehabilitation, prosthetics, orthotics, and quantification of musculoskeletal disease and treatment. He has led studies of microprocessor-controlled knees that have notably improved the functional ability of amputees. Ken's work on orthotics has been sustained since 1992 when he first received NIH funding to work on a Logic Controlled Electromechanical Free Knee Brace — the original design effort on a class of devices now known as stance-controlled orthoses. Ken's efforts in musculoskeletal medicine have ranged from reducing overuse injuries in military recruits by developing an improved combat boot to pioneering work demonstrating the functional benefit of Botox injections for patients with cerebral palsy. His use of sophisticated motion analysis techniques to document objective outcomes of numerous orthopedic procedures have received the highest research awards in hip surgery, the Stinchfield Award from the Hip Society, as well as in knee surgery, the Insall Award from the Knee Society. More recently, Ken and co-workers have developed a novel fiber-optic sensor that can be inserted using the same clinical techniques used for intramuscular EMG, and he is also actively pursuing strategies for reducing falls in older adults.

Ken has made significant and sustained interdisciplinary and translational research contributions, which have advanced, expanded and strengthened the discipline of biomechanics. These contributions include 184 peer-reviewed publications, many of which have appeared in the highest impact biomedical, engineering and clinical journals, 37 book chapters, and over 250 abstracts.

Ken was a founding member of the Commission for Motion Laboratory Accreditation from 1999-2003. He served as President of the Gait and Clinical Movement Analysis Society from 2000-2001, and President of the American Society of Biomechanics from 2006-2007.

### 2013 Jim Hay Memorial Award Winner: Glenn Fleisig

Glenn Fleisig received his PhD from the University of Alabama at Birmingham in



# Past-President

## Don Anderson

1994, but by that time he had already established himself as a strong biomechanist in Sports and Exercise Science. Glenn's background and his entire professional career have been focused on sports biomechanics. After graduating in 1984 with his BS from MIT, interning at the US Olympic Training Center, and completing his MS at Washington University in St. Louis, Glenn was hired in 1987 by James Andrews, MD to develop the research program of the newly created American Sports Medicine Institute, where he has been the principal for the past 25 years.

Glenn is internationally recognized as a leader in throwing biomechanics, particularly with respect to baseball pitching. He has over 75 peer-reviewed publications and he has been invited to write over 30 manuscripts, 12 book chapters, and 50 guest lectures. His conference abstracts total more than 210. Arguably the most important result of his outstanding research in sports biomechanics is the fact that his research on throwing mechanics and injury directly led to widespread implementation of pitch count regulations for youth baseball players.

In addition to his numerous publications on throwing biomechanics related to injury and performance, he has worked to inform the general public through constant interviews and coverage in print, online, television, and radio media. He has analyzed the throwing biomechanics of pitchers for nearly every Major League Baseball team, giving recommendations for reducing injury risk and enhancing performance. He has also been a pitching safety consultant to Little League Baseball and a Medical Safety committee member for USA Baseball. Given that his primary appointment is at a private research institute and not an academic center, it is quite remarkable that Glenn created ASMI's Student Researcher Program, through which he has supervised 150 students from various universities.

### ASB Fellows: Class of 2013

The ASB Fellows are happy to announce their most recent member, who will be inducted in Omaha. Please congratulate Jill McNitt-Gray from the University of Southern California for her exceptional professional achievements and service to the field of biomechanics.

### Clinical Biomechanics Award Finalists (first authors listed)

Peter Barrance, Kessler Foundation Research Center  
*Tibiofemoral Contact Location Changes Associated with Lateral Heel Wedging - A Study Using Weight Bearing MRI*

Michelle Hall, The University of Melbourne  
*A longitudinal study of the knee adduction moment components post-arthroscopic partial meniscectomy*

### Journal of Biomechanics Award Finalists (first authors listed)

Joseph Geissler, New Jersey Medical School and New Jersey Inst. of Technology  
*Alendronate Treatment Elicits a Reduction in Mechanical Properties and the Density of Osteocyte Cells in Cortical Tissue*

Hunter Bennett, East Carolina University  
*Heterogeneous Regional Fascicle Behavior Within the Biceps Femoris Long Head*



## Additional 2013 Awards

### ASB Fellows

Jill McNitt-Gray,  
University of Southern  
California

### Student Travel Awards

Abbie Ferris,  
University of Northern  
Colorado

Alan Cudlip,  
University of Waterloo

Ata Kiapour,  
University of Toledo

Dustin Crouch,  
VT - Wake Forest University

Federico Pozzi,  
University of Delaware

Leah Enders,  
University of Wisconsin-  
Milwaukee

Matt Coombs,  
University of Cincinnati

Michelle Hall,  
University of Melbourne

Nathan Pickle,  
Colorado School of Mines

Nicole Corbiere,  
Clarkson University

Rebecca Krupenevich,  
Eastern Carolina University

Sivan Almosnino,  
Queen's University

Taylor Dick,  
Simon Fraser University

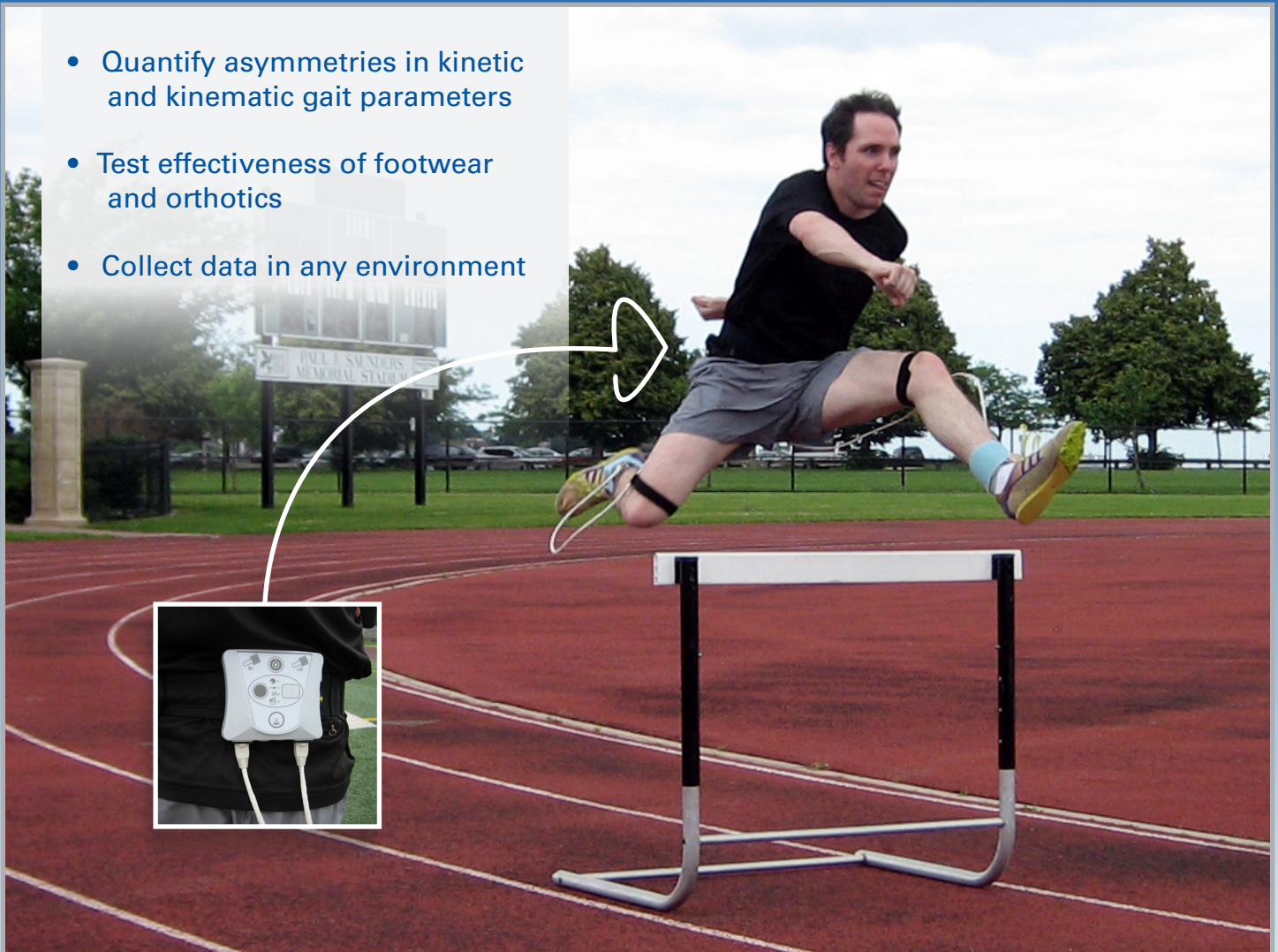
Vara Isvilanonda,  
University of Washington



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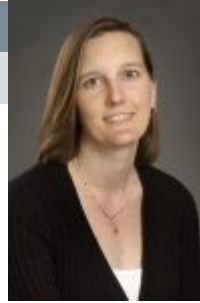
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# Communications Committee

## Michelle Sabick



The big news from the Communications Committee is that we are hard at work redesigning the ASB website this summer. The focus is on making the site more dynamic, easier to navigate, and more tightly integrated with the social networking feeds that we maintain on [Facebook](#) and [Twitter](#).

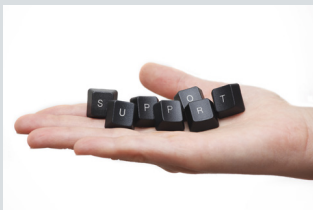
The plan is to unveil the new site in September during the Annual Meeting in Omaha. In preparation for that unveiling, I would love to receive any feedback that members have regarding how to enhance the site. One very specific need that our group has is for excellent images that represent biomechanics, biomechanics research, and/or the American Society of Biomechanics. If you have some images from your laboratory or a project that you have worked which would look nice on the website, I would love it if you would send them my way via e-mail ([MS-abick@boisestate.edu](mailto:MS-abick@boisestate.edu)). Please ensure that you own the copyright to the images and that you would be willing to share them with the world via the ASB website.

I would like to thank the group of ASB Fellows, led by Paul DeVita, that is aiding me in the website redesign. Any input that I can get during the planning stages of the redesign is extremely helpful, and the Fellows stepped up and volunteered their insight based on many years of expertise in biomechanics and their experience in designing and executing successful websites for their laboratories or for annual meetings. I would also like to thank the ASB Executive Board who gave me the go-ahead (and budget) to work with a professional web designer on this important project.

In addition to the website having a new look and feel, in the future it will be easier to manage due to a new software platform for editing. I have also been working behind the scenes to reorganize many of the online resources of ASB—everything from the Videos of the Month, to the recorded webinars, to information and video clips from past tutorials—into just one or two web locations. Hopefully, this work will facilitate the growth of ASB's online presence, and streamline both navigation and management of all of ASB's communications channels. Please keep sending me your ideas and comments, and I look forward to seeing all of you in Omaha in September!

*"We've all heard that a million monkeys banging on a million typewriters will eventually reproduce the entire works of Shakespeare. Now, thanks to the Internet, we know this is not true."*

**- Robert Wilensky**



## ASB Corporate Members 2013

Corporate membership categories 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 [Gary Heise](#), Treasurer.

The ASB Executive Board is pleased to recognize the following companies:

### Supporting Member Polhemus

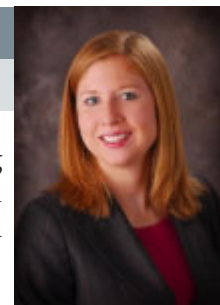


### Partner Member Tekscan



# ASB Mentoring Program

**Jennifer Bagwell**



The ASB Executive Board is pleased to announce the Mentoring Program at the ASB annual meeting in Omaha, NE. The goal of this program is to optimize the educational and professional experience of students attending the conference in August.

Anyone attending the annual meeting can participate as a mentor. We are currently seeking members who would be willing to serve as a mentor to students. If you would like to participate, please contact me by Friday, July 12, 2013. I will work with the ASB executive board to find suitable matches between students and mentors based on research interests and/or special requests.

We envision that the following type of interactions between the student and the mentor will take place at the ASB meeting:

- The mentor will introduce the student to colleagues and help the student establish a professional network.
- The mentor and student will discuss educational and/or career objectives over lunch or dinner.
- The mentor will share career experience with the student.
- The mentor will attend the poster/podium presentation of the student and provide constructive feedback.

Please contact me, Jennifer Bagwell ([petersjj@usc.edu](mailto:petersjj@usc.edu)), the ASB Student Representative, by Friday, July 12, 2013 if you would like to participate. In your message, please include the following:

- Your contact information (name, email address, phone number, etc.).
- A brief description of your research interests.
- Your career stage.

Notifications of the final matches will occur in early/mid August. Following notification, it is the student's responsibility to contact their assigned mentor to make arrangements to meet at the annual meeting. For more information please go to the ASB webpage ([www.asbweb.org](http://www.asbweb.org)) or the annual meeting website (<http://www.unomaha.edu/biomech/ASB/index.php>).

I hope that you share the ASB Executive Board's enthusiasm for the Mentoring Program. This program is a great opportunity and I hope you take advantage!

*"Tell me and I forget, teach me and I may remember, involve me and I learn."*

**- Benjamin Franklin**



# ASB Regional Meetings

## Rocky Mountain Regional ASB Conference

The third annual Rocky Mountain Regional American Society of Biomechanics Conference was held April 12-13 in Estes Park, CO. Approximately 90 attendees from inside and outside the Rocky Mountain region participated in the conference activities. The conference included four podium sessions, two poster sessions and many networking opportunities for students and faculty. A stimulating keynote lecture was given by Dr. Wendy Murray, Associate Professor of Biomedical Engineering and Physical Medicine and Rehabilitation at Northwestern University, about her work in musculoskeletal modeling of the upper extremity. The Rocky Mountain Region would like to especially thank the American Society of Biomechanics for their generous support of the meeting. The region would also like to extend their thanks to Delsys for providing four student presentation awards, as well as Vicon and Tekscan for their support of Friday night dinner for conference attendees. For more information about the conference, including the scientific program, please visit [sites.google.com/site/asbrockymountain](http://sites.google.com/site/asbrockymountain).

Anne Silverman, Bradley Davidson, and Alaa Ahmed, co-organizers

## South Central ASB Regional Meeting

The 2013 South Central ASB Regional Meeting was successfully held at Texas Woman's University – Dallas on April 13 - 14. Sixty-six students, faculty members and guests attended this event. Students and faculty presented 17 biomechanics research projects. Four students, Rena Hale (UT El Paso), Sangwoo Lee (Texas Woman's University), Ram Haddas (Texas Tech University Health Sciences Center) and Lee Atkins (Texas Tech University Health Sciences Center), received awards for their presentations. The winning presentation was "Tibio-femoral Intersegmental Force due to Time Varying Muscle Loads in In-Vitro and Computational Stimulations" by Ms. Rena Hale. The keynote speakers were Rita Patterson, PhD, Director of Research and Professor at University of North Texas Health Science Center, and Lawrence Lavery, DPM, MPH, Professor at Department Surgery, University of Texas Southwestern Medical Center. Because of the generous grant support of the ASB and TekScan Inc., registration fees were waived. For more information, please see [sites.google.com/site/scasbtwu2013/](http://sites.google.com/site/scasbtwu2013/).



Dr. Lavery's talk was titled "Etiology and Treatment of Diabetic Foot Ulcers – A Biomechanical Perspective".

Sharon Wang, Elaine Jackson, and Fan Gao, co-organizers



# ASB Regional Meetings

## Northwest Biomechanics Symposium

On May 31<sup>st</sup> to June 1<sup>st</sup>, over 80 students, postdocs, and faculty from 11 different institutions attended the ninth annual Northwest Biomechanics Symposium at the University of Idaho in Moscow, ID. Attendees of this regional meeting sponsored by ASB came from five different states and two provinces and heard simulating talks ranging from molecular interactions to clinical analyses. A highlight of the meeting was the keynote provided by Andy Biewener of Harvard University, who provided a motivating talk on the influential research conducted in his laboratory. Student awards were presented to Seth Gilchrist of the University of British Columbia and David Howell of the University of Oregon. All the presentations were high quality, pointing toward a bright future for biomechanics research. We look forward to the next Northwest Biomechanics Symposium to be held at Willamette University in Salem, OR. For more information on this year's meeting, please see [wcmb.wsu.edu/nwbs2013/](http://wcmb.wsu.edu/nwbs2013/).



Andrew Biewener, keynote speaker of the 2013 NWBS, and his former graduate student, and co-organizer of the meeting, Craig McGowan. Dr. Biewener is from Harvard University and his talk was entitled “Neuromuscular and Biomechanical Studies of Terrestrial and Aerial Locomotion: Guiding the Development of Hill-type Muscle Models and Biorobotic Design”.

Craig McGowan, David Lin, and Anita Vasavada, co-organizers



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**Check in often for updates to the program on [Facebook](#), the [meeting website](#) and the [program site](#).**

## Program Chair

**Rakié Cham and April J Chambers (Co-Chair)**



The 2013 ASB annual meeting will be held in the CenturyLink Convention Center in Omaha, Nebraska from September 4th to September 7th. The theme of this year's meeting is "thinking beyond biomechanics," bringing together not only biomechanists but also other scientists, who strive to understand how biomechanical principles impact and interact with the broader biological behavior of a system. Thus, we look forward to a multidisciplinary biomechanics program at this year's meeting.

Consistent with this theme, three internationally known scientists were invited as keynote speakers:

- Dr. Nicolaas Bohnen, Professor of Radiology and Neurology at the University of Michigan, Ann Arbor, MI. Dr. Bohnen's research goal is to utilize imaging biomarkers (PET/MRI) in the effective implementation of targeted and personalized medicine of patients with mobility impairments, including patients affected by neurodegenerative disorders and older adults.
- Dr. Taija Finni, Professor in kinesiology at the Department of Biology of Physical Activity, University of Jyväskylä, Finland. Dr. Finni's research interests are in the area of biomechanics and exercise physiology. She is also interested in translational research related to physical activity. This keynote is sponsored by the International Society of Biomechanics.
- Dr. Shane Farritor, Professor of Mechanical Engineering at the University of Nebraska-Lincoln. His research interests include space robotics, surgical robotics, and biomedical sensors.

In addition, three symposium sessions are planned:

- A Continuum of Pediatric Biomechanics: From Clinical to Technical
- Biomechanics in Disability Research
- Teaching Biomechanics

To add to the fun, the following six "heated" thematic poster sessions, moderated by top dynamic researchers in the field, are included in the program:

- Aging, obesity and falls
- Biomechanics of neurodegenerative diseases
- Gait in adults with amputations
- Knee osteoarthritis
- Sports: control of posture
- Variability in posture, gait and running

Other sessions include the following:

- Over 20 podium sessions focused on various topics, including balance and falls, running, energetics, upper extremity biomechanics, motor control in locomotion and motor control beyond biomechanics, ACL-related injuries, imaging of soft tissues and bone, low back pain, ergonomics, gait in amputees, gait in patients with cerebral vascular conditions, modeling, instrumentation and more.

# Program Chair

**Rakié Cham and April J Chambers (Co-Chair)**

- 3 poster sessions
- Awards sessions
- Tutorials
- Tours of research facilities
- Fun social activities, including dinner at the Zoo!

What's most exciting about this year's program is the significant involvement of the program committee. Specifically, abstracts for each thematic poster and podium session were selected by the program committee members, i.e., by scientists with expertise in the specific areas of the sessions included in the program. This process required a significant amount of time and effort. We would like to thank the following expert scientists who helped with this process:

- Kai-Nan An, PhD (Mayo Clinic)
- Paul DeVita, PhD (East Carolina University)
- Clark R. Dickerson, PhD (University of Waterloo)
- Jonathan Dingwell, PhD (University of Texas at Austin)
- Jinger S. Gottschall, PhD (The Pennsylvania State University)
- Chris Hass, PhD (University of Florida)
- Thurmon E Lockhart (Virginia Tech)
- Michael L Madigan, PhD (Virginia Tech)
- Jean L. McCrory, PhD (West Virginia University)
- Richard R. Neptune, PhD (University of Texas at Austin)
- Maury A. Nussbaum, PhD (Virginia Tech)
- Stephen Piazza, PhD (The Pennsylvania State University)
- Michelle Sabick, PhD (Boise State University)
- Robert A. Siston, PhD (The Ohio State University)
- Brian R. Umberger, PhD (University of Massachusetts)

See you in Omaha!

## 2013 ASB meeting schedule

<http://www.openconf.org/asb2013/openconf.php>

Please note the "mobile program" link that you can use on your Mobile device. We will be continuously updating the schedule. Check back soon!



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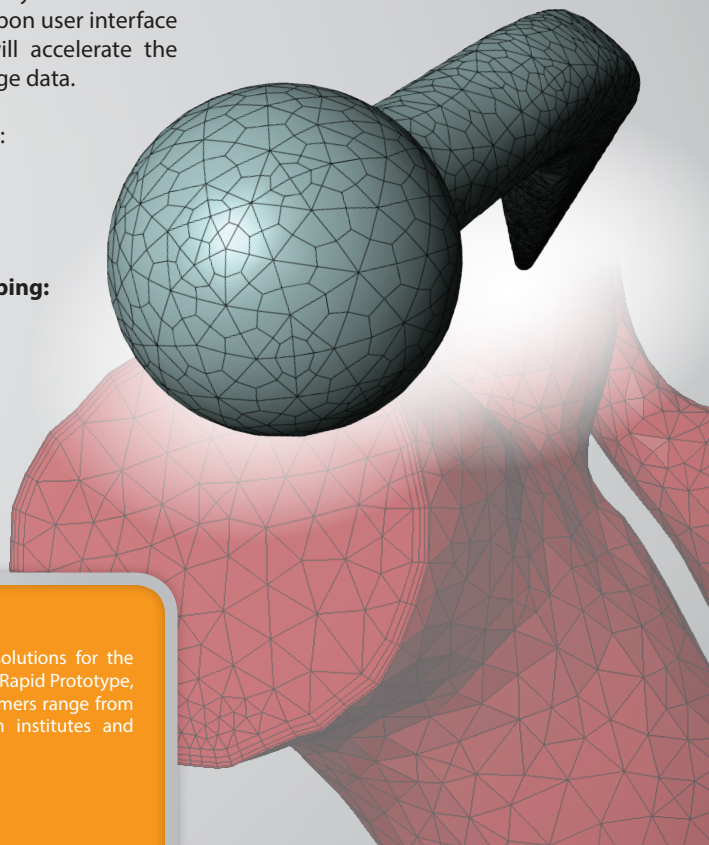
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## ASB Grant-in-Aid

**Leah Enders:** “The role of reduced tactile sensation in altered phalanx grip force in persons with stroke”

This study examines stroke survivors’ ineffective power grip strategies (control of phalanx normal force and angular deviation of phalanx force) which may contribute to their likelihood of dropping objects. These ineffective power grip strategies could be the result of not only motor deficit, but also tactile sensory deficit that often occurs in the upper extremity post-stroke. The objective of this research study is to determine (1) the influence of sensory deficit on altered power grip strategies and (2) the effect of sensory enhancement in improving stroke survivors’ power grip. This study will determine the benefits of sensory enhancement in grip control. This is applicable to developing effective rehabilitation therapies for stroke survivors and increasing their independence in daily living.

**Jim Becker:** “Toward an Understanding of Prolonged Pronation: Implications for Medial Tibial Stress Syndrome and Achilles Tendinopathy”

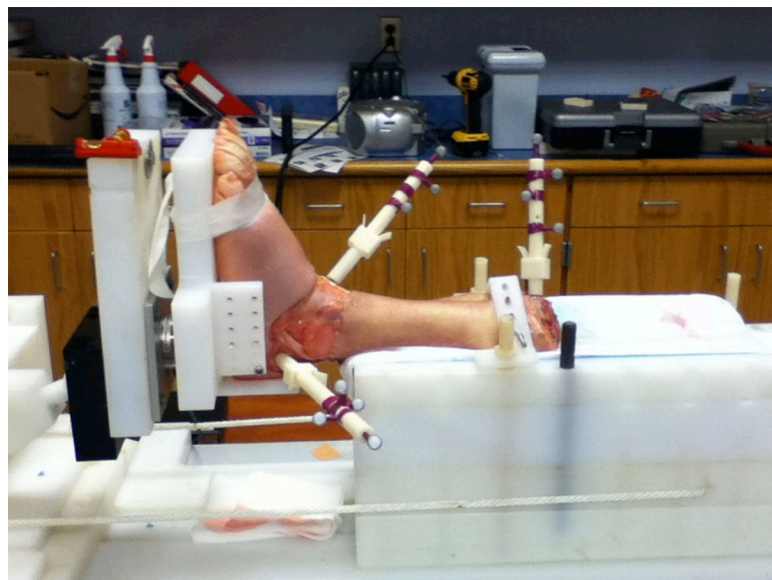
Excessive amounts or velocities of pronation are often cited as biomechanical factors contributing to common running injuries. However, there is conflicting evidence in the literature supporting this relationship. This project examined an alternative hypothesis that it is not necessarily the amount or velocity of pronation which matters, but rather the duration the foot remains in a pronated position throughout stance phase. The project was completed in several phases. First, we sought to identify biomechanical markers of clinically determined prolonged pronation. The results show that healthy runners with prolonged pronation differ from those with non-prolonged pronation by having a longer period of pronation, a more everted calcaneus position at heel off, higher tibia varus angles during quiet stance, reduced prone hip internal rotation range of motion, and a more medially oriented center of pressure trajectory under the foot. Second, we compared runners currently symptomatic with medial tibial stress syndrome (MTSS) or Achilles tendinopathy (AT) with healthy matched controls. Compared to controls, the injured individuals did not differ in either the amount or velocity of pronation. However, the injured individuals did display the biomechanical markers of prolonged pronation. Finally, we used OpenSim to examine musculotendinous kinematics in runners currently injured with MTSS or AT, healthy matched controls with non-prolonged pronation, and runners who were currently healthy but demonstrated prolonged pronation. Compared to healthy non-prolonged pronators, injured runners demonstrated higher average musculotendinous strains in the plantar flexors during mid and late stance. In many cases runners who were healthy but had prolonged pronation demonstrated average musculotendinous strain values falling between those of the injured and healthy non-prolonged pronating groups.

When viewed as a whole the results of this project suggest pronation duration is a unique biomechanical measure, distinctly different from the amount or velocity of pronation, and may be an important factor in the development of common overuse running injuries. Dr. Becker would like to thank the American Society of Biomechanics for providing the Grant-in-Aid funding for this project. The results will be presented at the 2013 ASB meeting in Omaha.

## ASB Grant-in-Aid

**Julie Choisne:** “An optimization method to help in the diagnosis of subtalar joint instability”

Subtalar instability may be caused by various ligamentous injuries. Combined instability at the ankle and subtalar joint is not adequately diagnosed. Further, isolated subtalar instability is usually misdiagnosed which may lead to long term damage to the joint. Developing a non-invasive and clinically practical tool to diagnose subtalar joint instability would be an important asset. Looking at the differences in the orientation of the subtalar and ankle joint axes instead of the angle of rotation of each joint might help in the diagnosis. Kinematics from nine cadaveric feet were collected from the tibia, talus and calcaneus with a 6-camera Motion Analysis Eagle System (Motion Analysis corporation, Santa Rosa, CA) in combination with the MotionMonitor (Innovative Sports Training, Chicago, IL). Inversion-Eversion was applied on an intact foot and after sequentially sectioning the CFL and the intrinsic ligaments. A two-hinge joint optimization model was developed to approximate the ankle and subtalar joint axis during inversion based on the kinematics of the calcaneus and the tibia. The optimization determined subject-specific subtalar and ankle joint axis for each condition. Isolated CFL sectioning increased ankle joint inversion while sectioning the CFL and intrinsic ligaments affected subtalar joint stability. The inclination and deviation angles of the optimized subtalar joint axis were similar to previous studies. The optimized subtalar and ankle axes were significantly different that the ‘true’ subtalar and ankle joint axes determined from inversion-eversion. The orientation of the optimized subtalar and ankle joint axes did not change after ligament injury was created to the foot. Future work would improve the optimization to look at the change in the angle of rotation around the optimized subtalar and ankle joint axes to detect subtalar joint instability.



A foot in the loading device.

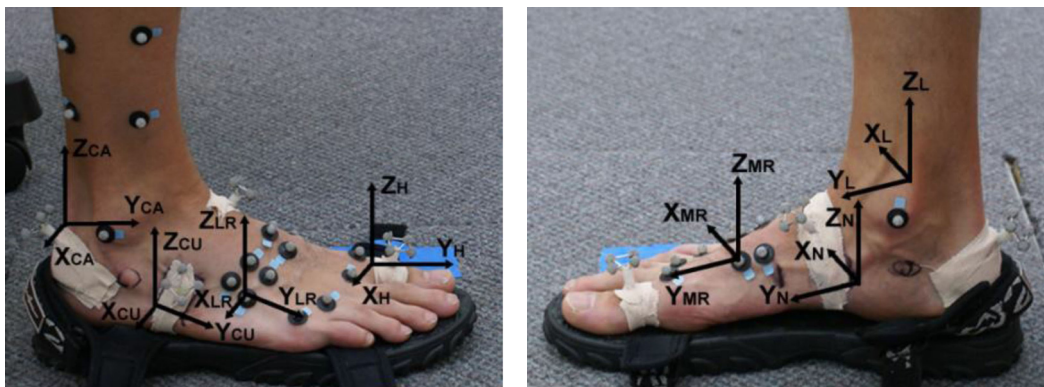


# ASB Grant-in-Aid

**Robin (Bauer) Pomeroy:** The effects of plantar fasciitis on multi-segment foot running gait kinematics

As an ASB graduate student member, I submitted my thesis research project as a Grant-In-Aid proposal and was fortunate to receive this funding for 2012. I conducted my research at the University of Wisconsin-Milwaukee, incorporating the department's 10 camera Eagle-system, AMTI force plate, and Vivid-i ultrasound unit to study the effects of plantar fasciitis on multi-segment foot running gait kinematics. With the Grant-In-Aid, I was able to supplement the lab's equipment with supplies needed to perform the gait analysis and ultrasound imaging. I recently defended my Masters thesis, which would not have been possible without the support of the ASB Grant-In-Aid.

Plantar fasciitis is a serious injury caused by mechanical overload that affects 10% of all runners. Due to its prevalence, there are numerous questions on the effects of plantar fasciitis on running kinematics. While it is not feasible to conduct invasive in-vivo studies to measure the plantar fascia directly, gait analysis enable quantification of the motion of the foot while performing dynamic activities. The kinematics can be used to infer the motion of the plantar fascia and how well it is functioning. Previous research investigating runners with plantar fasciitis have been equivocal. They primarily focused on modeling the entire foot as a single rigid segment or only tracking the rearfoot. I used a reliable six-segment foot model to compare running kinematics between runners with and without plantar fasciitis. This allowed for identification of midfoot and forefoot motion. I also incorporated ultrasound measurements to look at any difference in thickness of the plantar fascia between groups.



Technical and anatomical markers of the six-segment foot model.

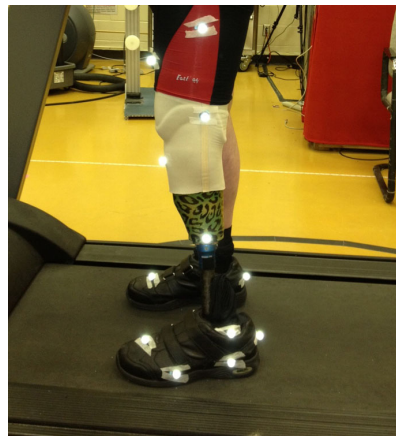
*"If we knew what it was we were doing, it would not be called research, would it?"*  
- Albert Einstein



## ASB Grant-in-Aid

### **Shane Wurdeman:** Quantifying Stride-to-Stride Fluctuations in Amputee Gait: Implications for Improved Rehabilitation

There is currently a tremendous lack of research examining the dynamics of amputee gait. This lack of research limits our ability to objectively select proper prostheses and improve design and performance. Quantifying the dynamics of amputee gait could offer new insights on how the stride-to-stride fluctuations that naturally occur within gait are being influenced by prosthesis wear. Current measures of typical amputee gait fail to account for dependencies within stride-to-stride fluctuations. At the Nebraska Biomechanics Core Facility, we are using the largest Lyapunov exponent (LyE) to measure the stride-to-stride fluctuations in amputee gait to determine the dynamics of the interacting biological and prosthetic systems. We have initially shown a strong relationship between the LyE and prosthesis preference. This finding holds strong clinical implications as it is the first biomechanical measure to hold a significant relationship with the patients' preference. Furthermore, we are investigating the influence of neuromuscular learning through an adaptation period in a randomized, crossover design study. Individuals wear two different prostheses for two separate 3 week periods, with a series of gait analyses throughout each period. Our preliminary analyses (16 individuals with unilateral, transtibial amputation) have confirmed our previous study with regards to increased stride-to-stride fluctuations about the prosthetic ankle motion compared to the sound leg ankle motion. Furthermore, there is a significant quadratic trend in the measure of stride-to-stride fluctuations (i.e., LyE) for ankle motion during adaptation with a decrease in LyE after 1.5 weeks, but then a return to baseline following 3 weeks. Finally, we are seeing that the prosthesis initially classified as "less appropriate" for the individual based on his/her activity level, to have increased stride-to-stride fluctuations compared to the prosthesis classified as "more appropriate". These findings collectively suggest the use of the LyE as a potential clinical measure verifying the subjective response from lower limb loss patients with regards to prosthetic rehabilitation as well as serving to guide prosthetic prescription in terms of which device is more appropriate for an individual.



An instrumented trans-tibial amputee.

# 37<sup>th</sup> Annual Meeting of the American Society of Biomechanics Omaha, Nebraska September 4-7, 2013

A note from the meeting chair

Omaha's Eppley Airfield was featured in the George Clooney movie "Up in the Air" as one of the easiest airports to travel to and from in the US. After landing in the city of Warren Buffett, the

Omaha's Henry Doorly Zoo is rated the largest zoo in the world by Touropia and the #1 zoo in the nation by Trip Advisor

oracle of Omaha, several ASB highlights are awaiting you, including an opening reception on the terrace of our CenturyLink convention center, overlooking the stunning downtown Omaha area.

Additionally, the Nebraska Biomechanics Core Facility will be hosting an open house in its new home – the 23,000 square foot Biomechanics Research Building! Demos, drinks and hors d'oeuvres will allow for a perfect relaxing but stimulating evening. On Friday, September 6<sup>th</sup>, we are excited to host the banquet in the unique aquarium of the Henry Doorly Zoo! The aquarium, desert dome, and jungle will be open for ASB attendees! Other highlights to check out while you are in town: The luminous Bob Kerry Pedestrian Bridge crossing the Missouri River, the Joslyn Art Museum, and the several fine restaurants, pubs and shops in the historic Old Market, all located within a short walking distance from the CenturyLink convention center and our headquarters at Hilton Omaha. We look forward to seeing you in September!

Omaha's average high temperatures in September are 74-81° F! The weather is just perfect!!

Student refunds are available through the National Institutes of Health!

The conference will also be hosting two unique "first-time ever given in ASB" tutorials on Wednesday, September 4<sup>th</sup>. From 12:30-2:00 a tutorial on **Nonlinear Analysis: Theory and**

**Applications**, will present the basics in nonlinear analysis and how it can be used to analyze biomechanical data. From 2:30-4:30, come learn about **Teaching STEM Concepts with Educational Robots**. This tutorial will be interactive, showing how educational robots can be used to facilitate higher level problem solving in biomechanics and bioengineering design work, while also deepening understanding of basic STEM concepts. For more information on these exciting tutorials, visit our website at <http://biomech.unomaha.edu/ASB/Tutorials.php>.

PT and ATC continuing education units available.

We are looking forward to seeing you in Omaha this September!

Sincerely,  
Nick Stergiou

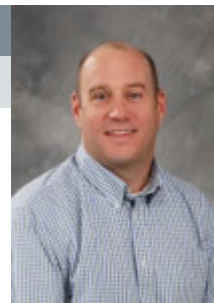
## Other information:

- ❖ Early Bird registration extended through July 5<sup>th</sup>!
- ❖ Website: <http://biomech.unomaha.edu/ASB/>
- ❖ Register now: <http://www.regonline.com/ASB2013reg>
- ❖ Contact: Ms. Amanda Fletcher at [alfletcher@unomaha.edu](mailto:alfletcher@unomaha.edu)



# Umbrellas are for Tourists

William Ledoux



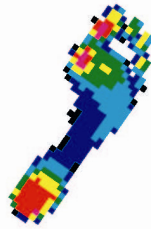
Greetings! Last December I noted that of all the things I wanted to accomplish as newsletter editor, a complete redesign of the layout was not one. That is still the case, but nevertheless, there was some discussion at the mid-year ASB executive board meeting about changes that could be implemented. For example, we could switch to a style similar to the ISB newsletter, which comes as an email with many small paragraphs and links to full articles – if one wishes to read more, just click on the appropriate link. However, at this time, we have decided to continue with the electronic format developed by our last editor (Michelle Sabick). As currently laid out, one can read electronically as a pdf and take full advantage of all the hyperlinks in the file, but one can also print out the newsletter as a booklet if desired. And, if I may, Michelle's layout is aesthetically pleasing. I have made a few small tweaks – I've been a little more diligent on asking for reports from the ASB regional meetings (all 3 from last year) and from the previous Grant-in-Aid winners (all 5 from last year) and in general, I've tried to include more images. I have also added mug shots of all the ASB executive board members who have written articles – they are straight from the ASB web site, so they should all look familiar. Finally, I have created a more descriptive email announcing the newsletter, but given the pdf format of the document, it is not possible to link from the email to a specific article in the newsletter.

A second issue I'd like to discuss is that of the ASB archives, or lack thereof. Currently, there is a wealth of electronic information that is available to the ASB executive board (the mechanism is immaterial, but currently it is all on a Google Drive that we share access). There is certainly a lot collective knowledge contained there; for example, there is a "newsletter editor" folder that contains pdfs of previous issues, a document describing the newsletter editor's responsibilities as well as several other historical documents and reports. There is also a wealth of information amongst the active board member's personal experience. That, combined with the online resources, insures that board can continue to function well year-to-year as members change and rotate off (especially since key positions such as president and treasurer have overlapping terms). This bodes well for the continued and long-term success of the society, but does not address the issue of a physical archive, which was supposed to be the point of this paragraph.

As our society matures, and as the first and second generations of scientists who served on the ASB board retire, there is an opportunity for our society to collect the physical archives of our nearly 40-year history. As the editor, I was given hard-copies of previous newsletters, but little else. However, I can imagine that there are troves of archival data (photos, minutes of meetings, conference proceedings, etc.) that are scattered throughout the offices and attics of our former officers and earlier active members. I'd like to propose that we set up a physical archive of these documents and I'd be more than willing to serve as the point person. I'd invite anyone who is so inclined to contact me about sending my your relevant files. I hope to address this at the ASB business meeting in September. Perhaps there is also a need to collect electronic files that our members have been saving.

And with that, I'll end this editorial with a few more ideas in my pocket for future musings. Also, I like to once again invite contributions – relevant editorials, books reviews, etc. are always welcome. Enjoy the summer and see you in Omaha!

# novel



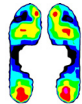
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## The ASB Grant-in-Aid Award Winners are:

**David J. Arpin**, University of Nebraska Medical Center

Advisor: Max Kurz

*Sensorimotor Cortical Activity in Children with Cerebral Palsy During an Isometric Motor Control Task*

**Renee Beach**, University of Dayton

Advisor: Kimberley Bigelow

*The Effect of Compliant Flooring on Postural Stability in an Older Adult Population and in Individuals with Parkinson's Disease*

**Binal Motawar**, University of Wisconsin-Milwaukee

Advisor: Na Jin Seo

*Identification of Neural Mechanisms for the Delayed Grip Relaxation in Chronic Stroke Survivors*

**Jo Armour Smith**, University of Southern California

Advisor: Kornelia Kulig

*Trunk Neuromechanics During Turning: A Window into Recurrent Low Back Pain*

**Senia Smoot**, University of Dayton

Advisor: Kimberley Bigelow

*A Pilot Study of the Effect of an Acute Vestibular Therapy on Postural Stability, Gait Variability, and Gaze Patterns of Children with Autism Spectrum Disorder*





# Events Calendar

**Dan Gales**

## NOTE:

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

### ASME Summer Bioengineering Conference

June 26-29, 2013, Sunriver, Oregon,  
Abstract deadline – past

[www.asmeconferences.org/sbc2013](http://www.asmeconferences.org/sbc2013)

### European College of Sport Science

June 26-29, 2013, Barcelona, Spain  
Abstract deadline – past

[www.ecss-congress.eu/2013/13](http://www.ecss-congress.eu/2013/13)

### IEEE Engineering in Medicine and Biology Society

July 3-7, 2013, Osaka, Japan

Abstract deadline – past

[embc2013.embs.org](http://embc2013.embs.org)

### International Society of Biomechanics

August 4-9, 2013, Natal, Brazil

Abstract deadline – past

[isbbrazil.com](http://isbbrazil.com)

### European Society of Biomechanics

August 25-28, 2013, Patras, Greece

Abstract deadline – past

[www.esbiomech2013.org](http://www.esbiomech2013.org)

### European Society of Movement Analysis for Adults and Children

September 2-7, 2013, Glasgow, Scotland

Abstract deadline – past

[www.esmac2013.com](http://www.esmac2013.com)

### American Society of Biomechanics

September 4-8, 2013, Omaha, Nebraska

Abstract deadline – past

[biomech.unomaha.edu/ASB](http://biomech.unomaha.edu/ASB)

### Human Factors and Ergonomics Society

September 30-October 4, 2013, San Diego, California

Abstract deadline – past

[www.hfes.org/web/HFESMeetings/2013annualmeeting.html](http://www.hfes.org/web/HFESMeetings/2013annualmeeting.html)

### European Orthopaedic Research Society

October 13-16, 2013, Servolo, Italy

Abstract deadline – past

[www.cors2013.org](http://www.cors2013.org)

### American Academy of Orthotists and Prosthetists

February 26-March 1, 2014, Chicago, Illinois

Abstract deadline – August 6, 2013

[www.oandp.org/meeting2014](http://www.oandp.org/meeting2014)

### Orthopedic Research Society

March 15-18, 2014, New Orleans, Louisiana

Abstract deadline: September 9, 2013

[www.ors.org/2014annualmeeting](http://www.ors.org/2014annualmeeting)

### World Congress of Biomechanics

July 6-11, 2014, Boston, Massachusetts

Abstract deadline - TBA

[wcb2014.com](http://wcb2014.com)

### 3-D Analysis of Human Movement

July 14-17, 2014, Lausanne, Switzerland

Abstract deadline - TBA

[3dahm2014.epfl.ch](http://3dahm2014.epfl.ch)



# American Society of Biomechanics 37<sup>th</sup> Annual Meeting



Omaha, Nebraska  
September 4-7, 2013  
CenturyLink Center



[biomech.unomaha.edu/ASB](http://biomech.unomaha.edu/ASB)  
[www.regonline.com/ASB2013reg](http://www.regonline.com/ASB2013reg)

Early Bird Registration (Extended!): Now – July 5  
Late Registration: July 6 – Sept 3