

Spring 2019

Chair: Devin Berg
Secretary: John BakerVisit the Mechanics Division Website: <https://sites.asee.org/mechanics/>

Message from the Chair

Dear Colleagues and Friends of the Mechanics Division,

May is here and it's time again to get plans in shape for the annual conference. This year, we're meeting in Tampa, Florida. Bring your sunscreen and antiperspirant and join us for a great four days together. As is customary for the spring newsletter, we outline many of the Mechanics Division activities taking place at the conference, including the program, division awards, banquet, and business meeting. This year's business meeting is scheduled for Wednesday afternoon, so please plan to stick around and join us to summarize the past year in the division and discuss the future.

JOIN US IN TAMPA June 15-19, 2019

This year's ASEE Annual Conference & Exposition will be held in Tampa, FL June 15-19, 2019. More information on the conference is available at:

<https://www.asee.org/conferences-and-events/conferences/annual-conference/2019>

I would like to extend my thanks to this year's division officers who have worked throughout the year to put together the mechanics program and to keep the division running. These include Carisa Ramming (Program Chair), Masoud Rais-Rohani (Program Chair Elect), John Baker (Secretary), Jacob Moore (Treasurer), Charles Krousgrill (Awards Chair), and, Vince Prantil (Past Division Chair). I would like to expressly thank Carisa for putting in a lot of work in preparing the program and making sure that we all have a great reunion this year!

I'm looking forward to seeing you all in Tampa this year and hope that you will all join us for the many division activities. Of course, we are grateful to the dozens of mechanics educators who will be contributing papers and presentations, as well the always-reliable reviewers who provided vital feedback to help us all in the preparation of our work for dissemination. See you soon in Florida!

Devin Berg
Chair of the ASEE Mechanics Division 2018-2019

2019 Mechanics Division Annual Conference Program

Program Chair, Carisa Ramming
Program Chair-Elect, Masoud Rais-Rohani

ASEE Division Mixer Sponsored by University of Florida & University of South Florida (Grand Ballroom, Tampa Convention Center, Sunday, June 16, 4:30 to 6:00)

This is a great chance to catch up with old friends and meet new colleagues from our division and from the entire ASEE community. Please look for the Mechanics Division banner.

Technical Sessions

This year, the Mechanics Division has a total of 30 peer-reviewed papers being presented in six different technical sessions, as listed below. All six technical sessions are in Room 8, Tampa Convention Center.

Monday, June 17

Session M339: Mechanics Division Technical Session 1, 11:30 AM-1:00 PM

Session M439: Mechanics Division Technical Session 2, 1:30 PM-3:00 PM

Tuesday, June 18

Session T139: Mechanics Division Technical Session 3, 8:00 AM-9:30 AM

Session T539: Mechanics Division Technical Session 4, 3:15 PM-4:45 PM

Wednesday, June 19

Session W139: Mechanics Division Technical Session 5, 8:00 AM-9:30 AM

Session W339: Mechanics Division Technical Session 6, 11:30 AM-1:00 PM

Hands-on Demonstrations Session (Mechanics Division and Mechanical Engineering Division)

Session T439: Tuesday, June 18, 1:30 PM-3:00 PM, Room 8, Tampa Convention Center. This is a session where mechanics educators get 5 minutes to present their most effective classroom demonstrations and hands-on activities.

There is still room for submissions for the hands-on demo session! If you would like to present a classroom demonstration or hands-on activity, please email a short synopsis to the Mechanics Division Program Chair, Carisa Ramming (carisa.ramming@okstate.edu).

Mechanics Division Poster Session

Session T339: A student poster will be presented Tuesday, June 18, 11:30 AM – 1:00 PM in the Exhibit Hall of the Tampa Convention Center.

Business Meeting

Session W439: Wednesday, June 19, 1:30 PM-3:00 PM, Meeting Room 9, Tampa Marriott Waterside - HQ Hotel (see p.5 for more information)

Awards Banquet (Off-Site)

Session T739: Mechanics Division Awards Banquet

Date and Time: Tuesday, June 18, 7:00 PM-9:00 PM

Location: American Social Bar & Kitchen
601 S Harbour Island Blvd
Tampa, FL 33602
<https://americansocialbar.com/tampa/>

Speaker: Prof. Autar Kaw
Department of Mechanical Engineering
University of South Florida
<http://AutarKaw.com>

Presentation title: A Solution to the Paradox of Choices – Lecturing, Flipped, Blended,

...

To attend the Awards Banquet, you need to purchase a ticket from ASEE. The cost is \$75 per person if you buy it in advance, or \$85 if purchased on-site. This year's awardees are listed on the following page.

2018–2019 Mechanics Division Awards

Ferdinand Beer and E. Russell Johnston, Outstanding New Mechanics Educator Award

Daniel W. Baker, Colorado State University

Archie Higdon Distinguished Educator Award

Phillip J. Cornwell, Rose-Hulman Institute of Technology

Mechanics Division James L. Meriam Service Award

Not awarded this year

Mechanics Division 2019 Best Paper Award

Do They Understand Your Language? Assess Their Fluency with Vector Representations

Eric Davishahl (Whatcom Community College), Todd Haskell (Western Washington University), Jill Davishahl (Western Washington University), Lee Singleton (Whatcom Community College), and Wade H Goodridge (Utah State University)

Mechanics Division 2018 Best Presentation Award

Effect of Assessment Methods on Performance in Mechanics of Materials

Ron Averill, Geoffrey Recktenwald, and Sara Roccabianca (Michigan State University)

Congratulations to the recipients! Also, we gratefully thank our sponsors, McGraw-Hill and Pearson, for their continuing support of the awards banquet.

Also, although not official awards, we would also like to recognize the presenters who received the highest presentation scores in their respective technical sessions at the 2018 conference. They are:

Session M339: Dynamic Pedagogies for Engineering Dynamics

Evaluating the Usage and Value of Supplemental Materials in a Dynamics Class (William E. Howard, Jeffry R. Foeller, and Karen A. De Urquidi)

Session M439A: Student Advancement in Mechanics of Materials

Effect of Assessment Methods on Performance in Mechanics of Materials (Ron Averill, Geoffrey Recktenwald, and Sara Roccabianca)

Session T139A: Curriculum and Instruction in Engineering Mechanics

Teaching Mechanics in Another Country – Reflections on a Professorenaustausch (Brian P. Self and Peter Michael Becker)

Session T539: Enhancing the Statics Classroom

Statics Modeling Kit: Hands-On Learning in the Flipped Classroom (Eric Davishahl, Russell Pearce, Todd R. Haskell, and Kordel J. Clarks)

Session W139: Applications of Technology in Mechanics Education

Teaching Modal Analysis with Mobile Devices (Charles Riley)

Session W339: Teaching Methods for Engineering Mechanics Courses

Efforts to Improve Free Body Diagrams (Kate N. Leipold and Sarilyn R. Ivancic)

Mechanics Division Annual Business Meeting

Date: Wednesday, June 19, 2019 1:30 PM to 3:00 PM

Location: Meeting Room 9, Tampa Marriott Waterside - HQ Hotel

All members and prospective members of the Mechanics Division are invited to the division business meeting. Division members will be allowed to vote. Draft minutes from last year's business meeting are provided on the following page.

One of the primary activities of the division business meeting is to elect new officers for the following positions.

Director. A director is a voting member of the Executive Committee. Main duties: attend the Executive and Business Meetings at the Annual Conference, elect the Program Chair Elect, and participate in decision making as issues arise. Directors must also be willing to accept a nomination for Program Chair Elect, which succeeds consecutively to Program Chair, Chair, and Immediate Past Chair. Term: 4 years.

Secretary. Main duties: Attend Executive and Business Meetings at the Annual Conference and record minutes; prepare ballots for elections of officers; prepare and distribute Newsletter (twice per year); assist Chair with ensuring that Division agenda is executed. Term: 1 year.

Treasurer. Main duties: Keep records of accounts; issue checks to award winners; pay and process other items as necessary. Term: 1 year.

If interested, please submit a nomination by 4:00pm on Monday, June 17, 2019. Nominations should be emailed to Devin Berg (bergdev@uwstout.edu). Include a brief statement of your current/past involvement in the Mechanics Division and your interest in serving in the office for which nomination is sought. If a person is being nominated for more than one position, please state preference. Self-nominations and/or multiple nominations are permitted.

If you have any items of business that you would like to be placed on the agenda for the Division Business Meeting, please contact Secretary John Baker (john.r.baker@uky.edu) by Friday, June 14, 2019.

2018 ASEE Mechanics Division Annual Business Meeting Minutes (DRAFT)

Note: A final version will be approved at the 2019 Mechanics Division Business Meeting. Please forward any needed corrections via email to john.r.baker@uky.edu.

Meeting Time: Tuesday, June 26, 2018, 7:00 AM to 7:55 AM

Location: Room 250 C, Convention Center -Salt Palace, Salt Lake City,UT

Attendees: John Baker, Devin Berg, Jakob Bruhl, Dale Cope, Phil Cornwell, Jul Davis, LeAnn Faidley, Carrie Francis, Matthew Jensen, Jen Kadlowec, Jacob Moore, Rungen Nathan, Masoud Rais-Rohani, Caria Ramming, Geoff Recktenwald, Brian Self, Kristi Shryock, Chris Venters, Anna Howard, Ed Howard, Chris Masters, Vince Prantil, Ren Tubergen.

Call to Order – 7:02 am (Prantil)

1. Welcome/Introductions (Prantil)
2. 2017 Business Meeting Minutes Approved (Motion: Anna Howard, Second: Jacob Moore)
3. Nomination of Directors for 2018-2022
 - a. Director 1: Phillip Cornwell
 - b. Director 2: Chris Venters
 - c. Treasurer: Jacob Moore
 - d. Secretary: John Baker
 - e. Program Chair Elect: Masoud Rais-Rohani
 - f. Awards Chair: Charles Krousgrill
 - g. Membership Chair: Jennifer Kadlowec

There were no contested offices or committee chair positions. Nominated directors were approved first (Motion: Jul Davis, Second: Jacob Moore). The Program Chair Elect was then approved (Motion: Brian Self, Second: Jen Kadlowec). The remaining officers and chairs were then also approved. Vince Prantil will file the new officer form with ASEE Headquarters.

4. Report from Division Officers
 - a. Chair (Prantil)
 - b. Program Chair (Berg)
 - b.i. Report on abstracts submitted, accepted and rejected
 - b.i.1. 41 abstracts submitted
 - b.i.2. 41 abstracts accepted
 - b.i.3. 0 rejected
 - b.ii. Report on papers submitted, accepted and rejected
 - b.ii.1. 29 papers submitted
 - b.ii.2. 29 papers accepted
 - b.ii.3. 1 paper removed by authors
 - b.ii.4. 0 papers in poster session
 - b.ii.5. 0 rejected
 - b.ii.6. 28 papers in the conference
 - b.iii. Report on how many reviewers
 - b.iii.1. 83 reviewers
 - b.iv. Report on sessions
 - b.iv.1. 6 technical sessions
 - b.iv.2. 1 business meeting (executive committee met off site)
 - b.iv.3. 1 awards banquet

- c. Program Chair-Elect (Ramming): The Awards Banquet is scheduled for the evening of the business meeting, Tuesday, June 26, at Squatters Pub Brewery in Salt Lake City. At the time of the business meeting, the awards banquet had 19 attendees paid through ASEE.
- d. Secretary (Baker): Spring newsletter published in May, 2018.
- e. Treasurer (Moore): On Oct 1, 2017, division had \$8,096 in BASS 303 in Operating Account.

There was discussion regarding the desire of the ASEE Board of Directors that each division retain about two years of budget in reserve and that each division develop a plan for retaining a reserve balance. There was consensus on the following plan with no objections raised:

The division will hold two years of operating expenses in reserve in its BASS account. Current reserve levels are set at \$10,000. Monies collected beyond that reserve level will be used to supplement additional awards or to reduce expenses such as the price for members to attend the annual awards banquet.

- f. Awards Committee (Cornwell)
Sponsors of awards:
 - \$2000 from McGraw-Hill.
 - \$2000 Pearson (doubled up because invoices weren't sent last year).
 - Two awards checks for \$750 will be sent out.
 - g. Membership committee (Kadowec): Membership is low, at approximately 200. There was discussion of passing out pens at the ASEE Division Mixer. Jen will come up with options. Members present are urged to encourage friends to consider joining.
 - h. Archivist/Hands-on Mechanics Website (Berg): The hands-on website is available. Devin is still uploading materials. There have been no interaction or comments posted, but there have been lots of looks. Members are encouraged to check it out and contribute.
5. PIC III Chair (Imbrie)
- For the first time in a while, ASEE has money in reserve.
 - The division should have a process in place for nominating members for society awards. There were only about 20 nominees this year.
 - The Program Chair-Elect can now access Monolith.
 - There were 3,841 registered for the conference this year.
 - ASEE is losing about 400 members per year.
6. New Business: None
7. Adjournment (Motion: Jacob Moore, Second: Ren Tubergen). Meeting adjourned at 7:55 am.

2018-19 Mechanics Division Officers and Standing Committees

Chair: Devin Berg, University of Wisconsin-Stout
(715) 232-1133, bergdev@uwstout.edu

Past Chair: Vincent Prantil, Milwaukee School of Engineering
(414) 277-7451, prantil@msoe.edu

Program Chair: Carisa Ramming, Oklahoma State University
(405) 744-9056, carisa.ramming@okstate.edu

Program Chair Elect: Masoud Rais-Rohani, University of Maine
(207) 581-4120, masoud.raisrohani@maine.edu

Directors: Ning Fang, Utah State University (2015–19)
(435) 797-2948, ning.fang@usu.edu

Kristi Shryock, Texas A&M University (2015–19)
(979) 845-0735, kshryock@tamu.edu

Julian Davis, University of Southern Indiana (2016–20)
(812) 461-5489, jldavis2@usi.edu

Anna Howard, North Carolina State University (2016–20)
(919) 513-4019, annahoward@annahoward.com

Brian Self, California Polytechnic State University (2017-21)
(805) 756-7993, bself@calpoly.edu

Renard Tubergen, Calvin College (2017-21)
(616) 526-7313, rqt3@calvin.edu

Phillip Cornwell, Rose-Hulman Institute of Technology (2018-22)
(812) 877-8232, cornwell@rose-hulman.edu

Chris Venters, East Carolina University (2018-22)
(252) 737-1028, ventersc@ecu.edu

Secretary: John Baker, University of Kentucky
(270) 534-3114, john.r.baker@uky.edu

Treasurer: Jacob Moore, Penn State Mont Alto
(717) 749-6209, jmoore@psu.edu

Webmaster: Brianno Coller, Northern Illinois University
(815) 753-9944, bcoller@niu.edu

Archivist: Ralph Flori, University of Missouri – Rolla
(573) 341-7583, reflori@mst.edu

Nominating Committee: Vincent Prantil, Chair (prantil@msoe.edu), Brianno Coller (bcoller@niu.edu), Christopher Papadopoulos (christopher.papadopoulos@upr.edu)

Membership Committee: Jennifer Kadlowec, Chair (kadlowec@rowan.edu), Matthew Jensen (mjensen@fit.edu), Julian Davis (jldavis2@usi.edu), Jennifer Kadlowec (kadlowec@rowan.edu), Shelley Lorimer (lorimers@macewan.ca)

Awards Committee: Charles Krousgrill, Chair (krousgrill@purdue.edu), Jakob Bruhl (jakob.bruhl@usma.edu), Julian Davis (jldavis2@usi.edu), Jim Papadopoulos (jpapadopoulos@partners.org)

Notes: Two Directors are elected at each annual Business Meeting for terms of four years. Directors who have served for at least one year are eligible to be elected as Program Chair Elect (and to serve consecutively as Program Chair and Chair). Secretary and Treasurer are ex-officio (non-voting) elected at each annual Business Meeting for terms of one year. Webmaster and Archivist are ex-officio (non-voting) and are elected for terms of one year. The Nominating Committee is specified to consist of the three most recent Past Chairs. The Membership and Awards Committee are appointed to serve for terms of one year.

Mechanics Division News and Announcements

Tenure-Track Assistant Professor in Engineering Education

The Department of Engineering Education (<https://engineering.usu.edu/eed/>) at Utah State University is seeking applications for one or two tenure-track assistant professor positions in engineering education, starting August 1, 2020. Candidates must have earned a doctorate in an engineering discipline, engineering education, cognitive science, education, or psychology by the start of the appointment. Candidates must have a B.S. and M.S. in an engineering discipline. Candidates must have ability to teach foundational undergraduate engineering mechanics courses, such as strength of materials, statics, and dynamics. The ideal candidates are expected to demonstrate potential to develop a strong and externally-funded research program in engineering education, a track record of peer-reviewed publications, potential or record of teaching competency at both graduate and undergraduate levels, and evidence of professional leadership skills.

Interested applicants should apply online via <https://careers-usu.icims.com/jobs/1485/assistant-professor/job>. The application should include: 1) cover letter; 2) curriculum vitae; 3) research statement describing the primary research areas and potential funding sources the applicant will target; 4) teaching statement describing teaching philosophy as well as undergraduate and graduate courses the applicant is capable of teaching; and 5) names, titles, phone number, and email addresses of three professional references. The review of applications will start the beginning of November 2019 and will remain open until the positions are filled. For inquiries, please contact the Search Committee Chair, Dr. Oenardi Lawanto, at (435) 797-8699 or olawanto@usu.edu.

“Blended Statics” at University of Maine

A new, “blended” version of Statics has been developed in the Department of Mechanical Engineering at University of Maine by Olivier Putzeys (Lecturer) and Serge Maalouf (graduate student TA). The “blended” (or “partially flipped”) course format includes a mix of traditional classroom lectures and pre-recorded video lectures. In a typical week (for a Tuesday/Thursday schedule), one period is a traditional lecture, and the other period is an “Activity Session”. Students watch several pre-recorded mini-lecture videos (typically 2-8 minutes long) and complete online quizzes before each Activity Session. In the Activity Sessions, students work on hands-on experiments (Fig. 1), computer simulations, and problems with support from the instructor and TA.

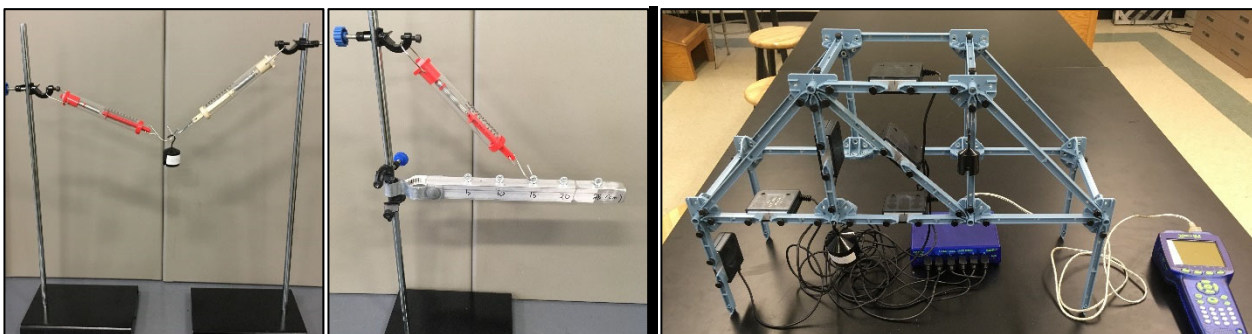


Figure 1. Hands-on experiments in Activity Sessions: equilibrium of a particle, equilibrium of a rigid body, and truss analysis (from left to right).

The mini-lecture videos are recorded using the “Lightboard” (Fig. 2) at the UMaine Center for Innovation in Teaching and Learning. The instructor writes on a glass board and the video images are inverted in post-processing.

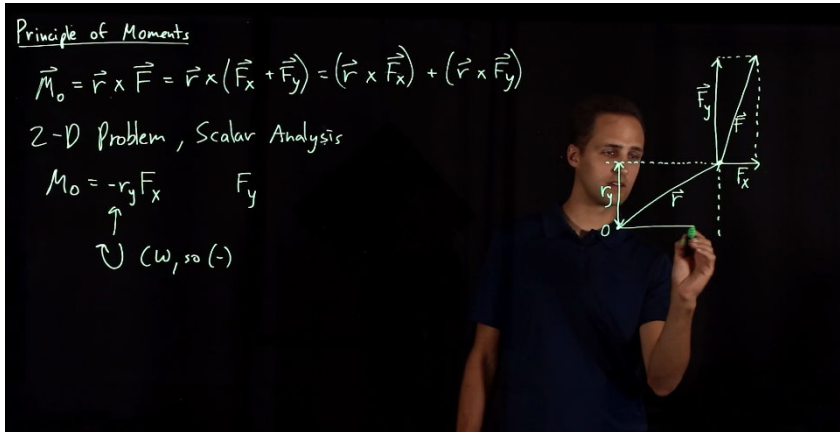


Figure 2. Screenshot of a mini-lecture video recorded on “Lightboard”

The blended course was taught on a trial basis in Fall 2018. Mid-semester and end-of-semester surveys showed that, in general, the students liked the blended format. In particular, the students generally enjoyed the Activity Sessions and found them beneficial. Course evaluations for the blended and traditional formats (taught by same instructor) were compared. The blended format scored slightly higher than the traditional format with respect to the questions “What is your overall rating of this course?” and “Were class meetings profitable and worth attending?” but slightly lower on “How orderly and logical were the instructor’s presentations of the material?” and “Did you develop significant skill in the field as a result of taking this course?” These data did not show a distinct advantage for one format over the other. For a direct comparison of student outcomes, the same final exam was given in both courses; the average scores were 80% and 85% for the traditional and blended courses, respectively.

The results indicate that the blended format was effective. The instructor enjoyed teaching the blended format, and was able to get better feedback from the students (e.g., concepts with which they were struggling) due to the interactions during the Activity Sessions. Perhaps the largest challenge in offering this blended version of statics is the enrollment. Most statics sections at UMaine have 30-50 students. The enrollment for the first offering of the blended format was limited to 20 students. Enrollments of more than 24 students may require meeting outside of normal class time for the laboratory experiments, or scheduling multiple lab sections. For the Activity Sessions in the classroom, higher enrollments should not pose a problem, as undergraduate assistants could be employed. An additional benefit of this work is that other faculty at UMaine and the University of Southern Maine can offer “Blended Statics” using the collections of videos and activities that have been developed. Contact: olivier.putzeys@maine.edu

Archival Materials

Got any interesting Division materials from past decades? Specific materials might include articles, photographs, Readiness Test results, role of the Mechanics Division in developing the mechanics curriculum, etc. Please contact Archivist Ralph Flori at (573) 341-7583, reflori@mst.edu.

ASEE Awards

ASEE has numerous awards available including the Lifetime Achievement Award which might be appropriate for one of our Mechanics Division Members that have been huge contributors throughout their careers. The nominations generally open in November and close in January. For a full list of awards, please visit www.asee.org/member-resources/awards/full-list-of-awards.

ASEE Lifetime Achievement Award in Engineering Education

The ASEE Lifetime Achievement Award recognizes individuals who have retired or who are near the ends of their careers for sustained contributions to education in the fields of engineering and/or engineering technology. The contributions may be in teaching, education, research, administration or educational programs, professional service, or any combination thereof. The award was established through the efforts of the ASEE Lifetime Achievement Award Steering Committee and funded by an endowment created for this award by the contributions of ASEE Life Members and like-minded, Not-Yet-Life Member Fellows.

The Award: The recipient will receive a \$1,000 honorarium, travel assistance up to \$1,000 for travel to the ASEE Annual Conference to receive the award, and a commemorative plaque.

Eligibility: Candidates shall have demonstrated sustained contributions to education in the fields of engineering and/or engineering technology throughout their careers. These contributions may be in any combination of the following:

- Demonstrated excellence in teaching either undergraduate or graduate courses
- Mentorship of students beyond the classroom
- Important contributions to the understanding of teaching and learning through the conduct and publication of educational research
- Demonstrated leadership through the administration of departments, schools or college of engineering or engineering technology
- Volunteer activity and leadership in education societies

The candidates will be retired or near retirement and will have devoted their careers primarily to engineering education. ASEE membership is not required.