

Message from the Chair

Dear Mechanics Division Colleagues and Friends,

As we are rapidly approaching the end of an extraordinary year marked by unforgettable events and images, we are looking forward to 2021 in anticipation of seeing the grief-wielding pandemic in the rear view mirror. Although the 2020 Virtual Annual Conference did not fulfill everyone's expectations, it served as a prelude to what for many of us became a new mode of teaching and interacting with our students this Fall. I must confess that I was also caught a few times "speaking while on mute!" and amused by the choice of some background images in Zoom meetings.

Looking ahead, we are anticipating an exciting program at the next annual conference that we hope to be an in-person event in Long Beach, California in June 2021. I'd like to express my gratitude to Jul Davis (Program Chair) who has been working hard in managing the peer review process and division sessions, as well as Carisa Ramming (Past Chair) and Phillip Cornwell (Program Chair-Elect) for their support. The 2021 Mechanics Division program will include several technical sessions anchored by the popular Hands-on Mechanics session, the awards banquet, and the business meeting. If you are interested in participating in the Hands-on Mechanics session by giving a short oral presentation, please reach out to Jul (julian.ly.davis@usi.edu) to reserve a spot.

Our division is financially in a very good shape, which means we have the opportunity to explore innovative ways to use these funds to advance the division. We welcome your thoughts!

Every year we recognize colleagues for their contributions to Mechanics education. Please consider nominating a deserving colleague by following the instructions in the Call for Award Nominations.

With many thanks to all the individuals who have volunteered their time and effort in support of the division, including Vimal Viswanathan (Secretary), Jacob Moore (Treasurer), Devin Berg (Web Master), the division directors, and many others, I wish everyone a peaceful and joyful holiday season!

Sincerely,

Masoud Rais-Rohani
2020-21 Chair, ASEE Mechanics Division
Richard C. Hill Prof. & Chair
Department of Mechanical Engineering
University of Maine

JOIN US IN LONG BEACH June 27-30, 2021

Next year's ASEE Annual Conference & Exposition will be held in Long Beach, CA (as per the current information), June 27-30, 2021. More information on the conference is available at:

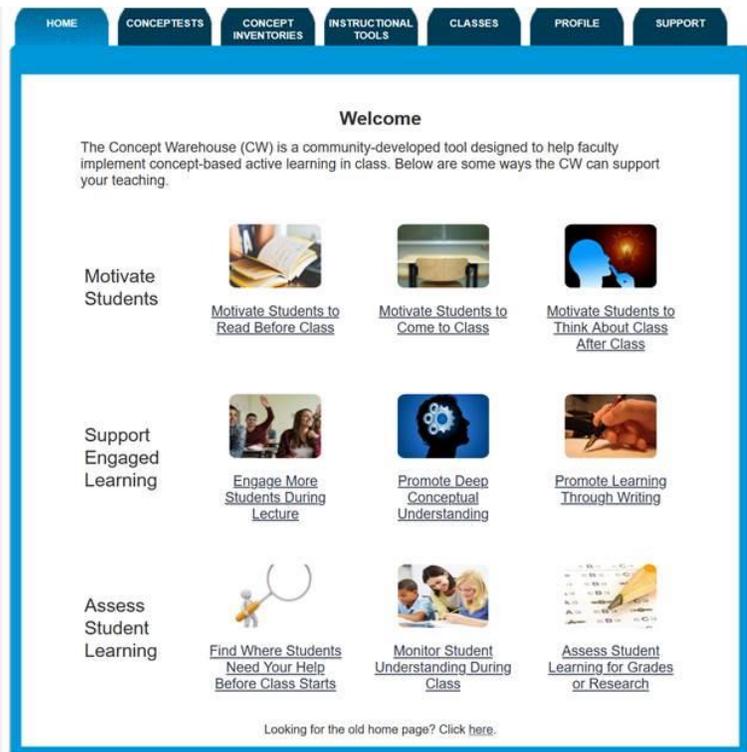
<https://www.asee.org/annual-conference/2021>

Mechanics Division News and Announcements

Concept Warehouse and Virtual Learning – Stipend Available!

Contributed by The Concept Warehouse Team - Brian Self, Milo Koretsky, Chris Papadopoulos, Susan Nolen, Mike Prince, Dom Dal Bello, and Jim Widmann

Looking for resources to use for virtual learning? The Concept Warehouse has nearly 500 concept questions on statics, dynamics, and strength of materials, and more are being added. There are thousands of others on thermodynamics, heat transfer, fluid mechanics, and other topics developed by the Chemical Engineering educational community. Additionally, we are developing Instructional Tools with simulations and guided inquiry (similar to our work on Inquiry-Based Learning Activities - see <https://peer.asee.org/increasing-conceptual-understanding-and-student-motivation-in-undergraduate-dynamics-using-inquiry-based-learning-activities> for more description of previous work). Currently a Pendulum Activity focusing on work and energy and impulse momentum is on the CW, plus numerous Virtual Labs and Inquiry Based Activities in Chemical Engineering topics (many of which overlap with other engineering disciplines). If interested, please sign up for an account at https://jimi.cbee.oregonstate.edu/concept_warehouse/.



As we have advertised previously, our team is running a Community of Practice for mechanics educators using the Concept Warehouse. There are stipends available for this if you agree to participate in some research interviews. Please email Brian Self at bself@calpoly.edu if you are interested in learning more, or if you have any other questions.

Sharing Example Problems for Statics, Dynamics, and Mechanics of Materials

Contributed by Dan Baker

Have students ever asked you for more example problems? This is one of the most common requests I field both during and in end-of-semester surveys. To meet this need, Eric Davishahl and I brainstormed that we could work with you all in the Mechanics Division to create a crowdsourced list of examples for Statics, Dynamics, and Mechanics of Materials.

Given that many of us have been teaching remotely over the past year, we hypothesize that there should be a wide range of examples available. If we could collect the links to publicly sharable examples, it would be easier to reference in our courses. Additionally, this fall we have been piloting our open educational resources (OER) textbook “Engineering Statics”, with draft content on the website <https://engineeringstatics.org>. One area we found ourselves a bit short was example problems, and this list could help us in that endeavor.

I've created a Google Sheet at https://docs.google.com/spreadsheets/d/1VkQvvJNKTEj_T3rGb_HfNi8yLC6or8kRW1Qw-SM36g/edit?usp=sharing. Down the road, we can consider creating a website or other outlets for this information. Thanks for your time to add your examples to the list. I'll be adding more of mine to the list over the holiday break.

If you have additional questions, please contact Dan Baker, dan.baker@colostate.edu

New Books & Publications of Interest

Abu Bakar Siddique and Tariq Khraishi published an article on "Eigenvalues and Eigenvectors for 3×3 Symmetric Matrices: An Analytical Approach" in the Journal of Advances in Mathematics and Computer Science. This analytical work may be of wide interest to scientists/engineers, especially mechanics researchers dealing with stress and strain tensors. Here is the link to the paper which is freely available: <https://www.journaljamcs.com/index.php/JAMCS/article/view/30308>

This year, Wendy C. Crone published her book on "Introduction to Engineering Research", published by Morgan & Claypool. This book is intended for undergraduate researchers and first year graduate students, and provides novice researchers with the guidance they need to be comfortable engaging with the research itself and also with their peers and mentors. It is designed to give them a deeper understanding of the broader context of research to reduce barriers to success, increase capacity to contribute to a research team, and enhance ability to work both independently and collaboratively. A sample is available at <https://bit.ly/2Y3TjSV>. and the book at: <https://bit.ly/2UoDsMI> (20% discount with the discount code **authorcoll**).

Call for Participation

Contributed by Canek Moises Luna Phillips

Dr. Phillips and his colleagues are conducting a study on factors search committee members consider when hiring STEM faculty. The study is part of a collaborative award among Rice, Texas Southern University, and University of Houston that is funded by the National Science Foundation (#1916093, #1916018, and #1915995).

Please participate in a ~20 minute survey that will ask your perspectives on factors that guide decisions about prospective faculty members during recruitment and hiring processes. At the end of the survey, you will be asked if you'd like to volunteer for an interview, and if you are selected and participate, you will receive a \$75 gift card. Your participation is voluntary, and you can withdraw from this study at any time.

If you are interested, please complete the [Perspectives on Faculty Recruitment Survey](#) by **Monday, December 21, 2020**. The consent form is linked on the first page of the survey.

Please also share this email with your networks. Participants must be tenured, tenure track, or non-tenure track faculty (excluding faculty who are research faculty/research scientists) in a STEM discipline (excluding clinical, social, and behavioral sciences) at an institution of higher education in the United States.

If you have any questions about this research or would like to receive the survey and consent form in an alternative format, please contact me or my research team member, Dr. Torrie Cropps (tc65@rice.edu).

Job Opportunities

POSITION ANNOUNCEMENT: Tenure-Track Assistant Professor of Engineering Education at Utah State University

Contributed by Ning Fang

The Department of Engineering Education (<https://engineering.usu.edu/eed/>) at Utah State University (USU) is seeking applications for a tenure-track faculty position at the assistant professor level. This is a nine-month academic-year appointment starting August 1, 2021. 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 also have a B.S. and M.S. in an engineering discipline. 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/2988/assistant-professor/job> and click on "Apply for this job online" button. The application should include: 1) Curriculum vitae; 2) Cover letter; 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 numbers, and email addresses of three professional references. Employment at USU is subject to background check. The review of applications will start on **January 15, 2021**, and will remain open until the position is filled. For inquiries, please contact the Search Committee Chair, Dr. Oenardi Lawanto, at (435) 797-8699 or olawanto@usu.edu. However, do not send your applications directly to Dr. Lawanto. All applications must be sent online via <https://careers-usu.icims.com/jobs/2988/assistant-professor/job>.

POSITION ANNOUNCEMENT: Tenure-Track Assistant Professor of Mechanical Engineering at San Jose State University

Contributed by Vimal Viswanathan

The Department of Mechanical Engineering at San José State University (SJSU) invites applications for a tenure-track faculty position at the rank of Assistant Professor. Applicants must have a strong academic background in mechanical engineering, as evidenced by a Ph.D. or equivalent degree in mechanical engineering or closely related field, and expertise in mechatronics. Applicants must have demonstrated experience in a field of mechatronics such as robotics, automation, artificial intelligence, embedded systems, human-machine interface, etc.

More details at: <https://jobs.sjsu.edu/en-us/job/497876/assistant-professor-mechanical-engineering>

Additional News Items

If you have any news items or announcements for the Spring 2021 newsletter, please send them to vimal.viswanathan@sjsu.edu by April 3, 2021.

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 Devin Berg at (715) 232-1133, bergdev@uwstout.edu.

Call for Award Nominations (Submit by February 15, 2021)

Archie Higdon Distinguished Educator Award

The Archie Higdon Distinguished Educator Award is given annually by the Mechanics Division for distinguished and outstanding contributions to engineering mechanics education. The nomination package should include the following:

1. A letter of nomination and no more than four accompanying letters of support which delineate the nominee's contribution to mechanics education,
2. Nominee's curriculum vitae.

The award consists of a plaque to be given at the annual Mechanics Division Banquet, a \$750 cash prize, and registration for the Mechanics Division Banquet for the awardee and a guest.

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

The Ferdinand P. Beer and E. Russell Johnston, Jr., Outstanding New Mechanics Educator Award is given annually to up to two individuals (contingent to availability of funds) who have shown a strong commitment to mechanics education. The winners are selected on the basis of their exceptional contributions to mechanics education. Individuals who have no more than five years of academic experience past their first regular academic appointment are eligible. The nomination package should include the following:

1. A letter of nomination which delineates the nominee's contribution to mechanics education and no more than two additional letters of support,
2. A one-page letter from the nominee describing his or her personal philosophy regarding mechanics education,
3. Nominee's curriculum vitae.

The award consists of a plaque to be given at the annual Mechanics Division Banquet, a \$750 cash prize, and registration for the Mechanics Division Banquet for the awardee and a guest.

Mechanics Division James L. Meriam Service Award

The Mechanics Division James L. Meriam Service Award may be given annually to recognize significant service to the Mechanics Division as characterized by notable leadership, significant contributions, and prolonged and dedicated service. Candidates for the award must be members of the Mechanics Division and must have served the Division for a minimum of ten years. No individual may receive the award more than once, and members of the Division's Awards Committee are not eligible for the award until two years after completing their service on that committee. Nominations may be made by all members of the Mechanics Division except for those members serving on the Division's Awards Committee. Each nomination package must include the following:

1. A chronological listing of the candidate's service to the Division,
2. A narrative statement detailing the significant elements of the service.

The award consists of a plaque to be given at the annual Mechanics Division Banquet, and registration for the Mechanics Division Banquet for the awardee and a guest.

Attendance at the ASEE Annual Conference is required for the awardees. Nominations are due by **February 15, 2021**. To submit nominations (or to arrange by mail) or for additional information please contact the Awards Committee Chair Christine Masters at cbm100@psu.edu.

2020 ASEE Mechanics Division Annual Business Meeting Minutes (DRAFT)

Note: A final version will be approved at the 2021 Mechanics Division Business Meeting. Please forward any needed corrections via email to vimal.viswanathan@sjsu.edu.

Minutes recorded by Kristi Shryock (on behalf of Vimal Viswanathan)

Meeting Time: Friday, June 26, 2020, 4:00-5:00 EST

Location: Virtual via Zoom

Attendees: Carisa Ramming, Devin Berg, Dan Mendelsohn, Ronald Averill, Amie Baisley, Amir Danesh, Anna Howard, Arnold Deffo, Ashraf Badir, Brian Self, Chris Papadopoulos, Christine Masters, Dom Dal Bello, Geoffrey Recktenwald, Hadas Ritz, Jacob Moore, Jakob Bruhl, John Burkhardt, Jul Davis, Masoud Rais-Rohani, Oludare Owolabi, Phil Cornwell, Rungun Nathan, Ventzi Karaivanov, Kristi Shryock

Call to Order – 4:00 pm

1. Welcome/Introductions
2. Conference Updates (Masoud Rais-Rohani)
 - 54 abstracts submitted, 1 rejected
 - 14 submissions withdrawn, 3 rejected at first draft stage
 - 36 papers finalized and presented
 - 4 papers tagged for diversity
 - 67 reviewers and 10 moderators
 - 9 tech sessions with 4 presentations each
 - 1 special session: Hands-on Mechanics
 - Virtual awards banquet and business meeting
3. Treasurer's Report (Jacob Moore)
 - Most up to date balance in BASS account: \$8,832.98.
 - Started fiscal year (9/1/19) with a balance of \$9,516.81.
 - All paperwork for the award honorariums has been received and should be paid out. This will be confirmed in the next update from ASEE HQ. If there are other expenses related to the banquet or awards, please reach out to Jacob.
 - Invoice has not been sent to McGraw-Hill for the usual \$2,000 support for the New Engineering Educator Award. Still do not have a contact person to send the invoice to at McGraw-Hill.
 - Finances are decently normal, and we will actually be up a bit this year because we do not have some of the normal expenses.
4. First Virtual Awards Banquet
 - Guest speaker: Professor Damiano Pasini, McGill University - Topic: Functional Mechanical Metamaterials
5. Division Bylaws Discussion

- Discussed filling of vacant roles and more clearly stating details on officer positions.
- It was agreed to continue Bylaws discussion at a later date due to time constraints of the business meeting
- Carisa Ramming to send out Doodle Poll for Scheduling

6. PIC Update on 2020 Conference (PK Imbrie)

- 3200 registrants
- >1700 papers
- <150 projections
- Increase of 8 papers from 2019
- Increase of 19 unique authors
- New PIC organization

7. Elections

- Director 1 and Director 2 (2020-2024)
 - o Anna Howard and Jakob Bruhl (uncontested, winner by acclimation)
- Treasurer
 - o Nominees: Jacob Moore and John Burkhardt
 - o Jul Davis – motion to make Jacob Moore Treasurer and John Burkhardt Treasurer-elect
 - o Second: Phil Cornwell
 - o Passed unanimously
- Secretary
 - o Vimal Viswanathan (uncontested, winner by acclimation)
- Program Chair Elect
 - o Phil Cornwell (uncontested, winner by acclimation)
- Awards Chair
 - o Christine Masters agreed to remain as Chair
 - o Geoff Recktenwald – committee
 - o Amir Danesh-Yazdi – committee

8. 2019 business meeting minutes approved (Motion: Jul Davis, Second: Rungun Nathan)

Adjourn 5:45pm EST

2020 Mechanics Division Awards

The Mechanics Division Annual Awards Banquet was held virtually on June 25, 2020 via ASEE's virtual conference system. Attendees were treated to a very interesting presentation on "Functional Mechanical Metamaterials", by Dr. Damiano Pasini, from McGill University. The award recipients were recognized at the event.

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

Amir Danesh-Yazdi, Rose-Hulman Institute of Technology
David Flaherty, United States Military Academy

Archie Higdon Distinguished Educator Award

Brian Self, California Polytechnic State University – San Luis Obispo

Mechanics Division James L. Meriam Service Award

Not awarded this year

Mechanics Division 2020 Best Paper Award

Modification of a Physics Rotational Kinematics Concept Inventory for use with Engineering Dynamics Students

Ann Reimers & Stefen Beeler-Duden (University of Virginia)

Mechanics Division 2019 Best Presentation Award

Just a Moment – Classroom Demonstrations for Statics and Solid Mechanics

James Giancaspro & Diana Arboleda (University of Miami)

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

2020-2021 Mechanics Division Officers and Standing Committees

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

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

Program Chair: Julian Davis, University of Southern Indiana
(812) 461-5489, jldavis2@usi.edu

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

Directors: Anna Howard, North Carolina State University (2020-24)
(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
Jakob Bruhl, The United States Military Academy (2020-24)
(845) 938-3131, jakob.bruhl@westpoint.edu
Chris Venters, East Carolina University (2018-22)
(252) 737-1028, ventersc@ecu.edu
Kristi Shryock, Texas A&M University (2019–23)
(979) 845-0735, kshryock@tamu.edu

Secretary: Vimal Viswanathan, San Jose State University
(408) 924-3841, vimal.viswanathan@sjsu.edu

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

Treasurer-elect: John Burkhardt, The United States Naval Academy
(410) 293-6507, burkhard@usna.edu

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

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

Nominating Committee: Devin Berg, Chair (bergdev@uwstout.edu), Vincent Prantil (prantil@msoe.edu),
Brianno Coller (bcoller@niu.edu)

Membership Committee: Jennifer Kadlowec, Chair (kadlowec@rowan.edu), Matthew Jensen
(mjensen@fit.edu), Shelley Lorimer (lorimers@macewan.ca), Nicolas Libre (libren@umsystem.edu),
Geoffrey Recktenwald (GDR@msu.edu).

Awards Committee: Christine Masters, Chair (cbm100@psu.edu), Geoffrey Recktenwald (GDR@msu.edu),
Amir Danesh-Yazdi (daneshya@rose-hulman.edu)

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.

New Officer Introduction

Jakob Bruhl, U.S. Military Academy - Director (2020 - 24)



Jake Bruhl is an Associate Professor in the Department of Civil and Mechanical Engineering at the US Military Academy, West Point, NY. He earned his PhD in civil engineering from Purdue University and, as a career active duty Army Engineer officer, has served in a variety of engineering leadership and staff positions around the globe. His research focuses on the design of protective and resilient structures along with how to develop creativity and judgment within engineering education. He teaches fundamental mechanics courses and structural analysis and design courses.

John Burkhardt, U.S. Naval Academy - Treasurer-elect



John Burkhardt is an Associate Professor at the U.S. Naval Academy in Annapolis, Maryland. He received his Ph.D. and M.S. degrees in Theoretical and Applied Mechanics from the University of Illinois, Urbana-Champaign. His bachelor of engineering degree is in Civil Engineering was awarded by The Cooper Union in New York City. Current research interests include atmospheric turbulence, machine learning applications in mechanical engineering, nondestructive testing, structural vibrations, acoustics and computational mechanics. His teaching interests are focused on engineering mechanics, particularly elementary mechanics instruction.

Mechanics Division - Opportunities for Involvement

All members and prospective members of the Mechanics Division are invited to the Mechanics Division Annual Business Meeting, held each year in June at the ASEE Annual Conference. One of the primary activities of the division business meeting is to elect new officers and fill available committee positions.

Some of the offices are described below. For a full list of positions, see “2020-21 Mechanics Division Officers and Standing Committees”, provided earlier in this newsletter.

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.

Officer Nominations:

You are welcome to submit nominations before or during the 2021 Mechanics Division Annual Business Meeting. Self-nominations and/or multiple nominations are permitted. Nominations may be submitted via email in advance of the meeting to Masoud Rais-Rohani (masoud.raisrohani@maine.edu). Include a brief statement of the nominee’s current/past involvement in the Mechanics Division and nominee’s interest in serving in the specific office. If a person is being nominated for more than one position, please state preference.

2021 Annual Division Business Meeting Agenda Items:

If you have any items that you would like included on the agenda for the Annual Division Business Meeting, please contact Division Secretary, Vimal Viswanathan (vimal.viswanathan@sjsu.edu), or Division Chair, Masoud Rais-Rohani (masoud.raisrohani@maine.edu), before the 2021 Annual Business Meeting.