

Mechanics Division Newsletter

Fall 2021

Division Website: <https://sites.asee.org/mechanics/>

Chair: Julian L. Davis

Secretary: Nicolas A. Libre

Message from the Chair

Dear Mechanics Division Folks,

As the end of our year quickly creeps upon us, I wish all of you a happy holiday and good luck in wrapping up the year. I hope that you have managed to navigate through another year staying healthy and (mostly) sane. It's hard not to notice the additional stress and burdens that the pandemic has placed on our students and fellow faculty. So, just take a minute, if you get a chance, and send good wishes to a fellow faculty member and one of your students! It'll put a smile on their face.

We had a successful fully online/virtual conference this past summer. The Zoom sessions worked out well. We had informative presentations. And the technology worked too; Phew! Thank you to everyone who made that happen. It really was a *pleasure* serving as your Program Chair last year.

As for the virtual banquet, thank you to everyone for attending. I appreciate everyone's support and hope that you enjoyed it. Thank you to our wonderful banquet speaker, Charles Radovich, Associate Prof. of Practice at University of Southern California. His talk about [What it Takes to Advise a Successful Competition Team](#) was quite informative and brought about good discussion. And of course, a special congratulations to our Mechanics Division award winners (see below)! Keep up the great work!

I hope that you are excited for an in-person conference in Minneapolis next summer. Get your papers ready, do great work, and teach well in-between! I would especially like to thank Phil Cornwell (phil.cornwell@afacademy.af.edu), this year's Program Chair, for his work thus far (especially dealing with a new system) and for the work he will be doing as our submissions start coming in (wink!). Remember to contact Phil if you are interested in participating in the "Hands-On Mechanics" session.

Thank you to those serving our division, including Nicolas Libre (Secretary), Jacob Moore (Treasurer), Devin Berg (Web Master), the division directors, committee members and many others. I know serving can be a lot of extra and un-expected work but know that it is appreciated. I would especially like to give a shout out to Carisa, Masoud and Phil for helping me navigate the necessary preparations for last year's conference. Thank you.

Please think about how you, as a division member, can contribute to growing and enhancing what we already have in our division. If you have any ideas that you would like to share that can make the Mechanics division even more successful, please don't be afraid to share them with myself (julian.ly.davis@usi.edu) or others in the group. We are at a point financially where we can explore new ideas. Also, please consider participating as an officer, and finding a home with us, just as I did many years ago. Descriptions of officer roles are included below.

I wish all of you a happy and safe holiday season. Please be safe in your travels, stay healthy, enjoy your time off, and rest up for the coming semester.

Most sincerely,
Jul

JOIN US IN MINNEAPOLIS June 26-29, 2022

Next year's ASEE Annual Conference & Exposition will be held in Minneapolis, MN (as per the current information), June 26-29, 2022. More information on the conference is available at:

<https://www.asee.org/events/Conferences-and-Meetings/2022-Annual-Conference>

Mechanics Division News and Announcements

Join Mechanics Community of Practice and Action Research Scholars Program – Stipends Available

Contributed by Brian Self

We are continuing our Community of Practice (CoP) focused on concept-based pedagogical practices. Join a group of like-minded professors who use concept questions and other evidence-based practices to promote student learning in mechanics. We'll be using the Concept Warehouse (CW) as a means to deploy the questions, and if you try out the CW and participate in an interview about your experiences there is a \$200 stipend available. It is a great venue to share teaching practices with others and find out great work being done in the mechanics community.

If you have some experience using the CW already, you can join our Action Research Scholars (ARS) program. Here, you can work with seasoned educational researchers to develop ways to evaluate your usage of the CW. We can help you develop strong research questions and develop publications for ASEE conferences and other venues. After completion and participation in an interview you can receive a \$500 stipend.

Facilitators for the CoP and ARS include long-time Mechanics Division members Chris Papadopoulos and Brian Self, ASEE Fellows Milo Koretsky and Mike Prince, Learning Scientist Susan Nolen, and Two-Year Division Chair Dom Dal Bello. Please email Brian Self at (bself@calpoly.edu) if you are interested.

Call for Participation

Contributed by Jacob R. Grohs

Several of us have been working on an early version of a problem-solving tool focused on engineering mechanics classes, specifically Strength of Materials/Mechanics of Deformable Bodies. Our vision on this is that this platform could:

- 1) enhance a student's ability to quickly explore and solve more problems than typically assigned in such courses to broaden their exposure and confidence in problem solving
- 2) effectively capture keystrokes to "understand" a student's solution method in order to:
 - provide more targeted feedback to students to improve their skills
 - provide a more objective means to assess a student's performance on homework, quizzes, and exams
- 3) offer an open-source resource with flexibility for interested instructors to easily:
 - add problems and train system with a correct solution
 - adjust numerous operational settings for their assignments, grading, etc. (e.g. from tutorial mode to homework mode to solo test mode)
 - extend to other problem-solving courses

Though there are still several features we aim to implement in this proof of concept version (e.g., individualized feedback and/or awarding of partial credit), we are at a point where your expert opinions would be very helpful and formative in our next steps. We would greatly appreciate your feedback on the tool, including your perceptions of the possible use cases and value-add of the instrument as well as key areas for improvement or redesign which would increase the likelihood it could be successfully deployed as part of the learning and/or assessment processes in these classes. Please find the survey link below. In the survey, you will see informed consent language about the research study we are conducting as well as a video tutorial (if desired) and links to some problems (which pop up on new tabs) within the interface that you can use to familiarize yourself with the system before providing feedback. Your feedback is solicited in the survey itself and should only take a few minutes, once you familiarize yourself with the tool. please click on the survey which provides you links to the tool.

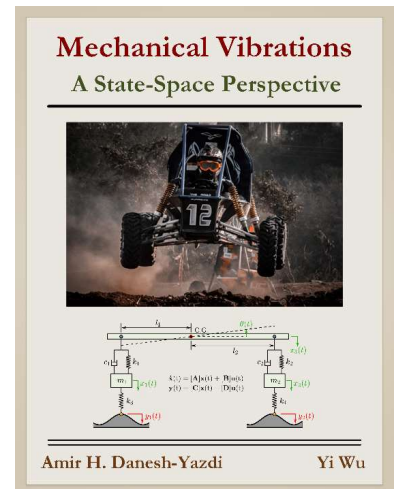
https://virginiatech.qualtrics.com/jfe/form/SV_bPpsCZfujYOD37M

New Books & Publications of Interest

Mechanical Vibrations: A State-Space Perspective:

Contributed by Amir Danesh-Yazdi

Amir H. Danesh-Yazdi and Yi Wu have completed work on their textbook, "Mechanical Vibrations: A State-Space Perspective" and are soliciting for reviewers with expertise in the field. In this online textbook, which is hosted on the Top Hat platform, the topics discussed in a typical undergraduate vibrations course have been tackled through the state-space approach, which until now had been used more extensively in the field of controls. A consistent framework has been developed based on this approach to study various vibration problems regardless of the number of degrees of freedom, free or forced nature of the vibration, or types of excitation. The textbook also includes animations visualizing virtually every vibration scenario discussed and numerous interactive questions (multiple-choice, matching, sorting and short answer) interspersed within the text to aid in the student's understanding of the presented material. Names of interested reviewers will be forwarded to a Top Hat representative, who will then provide them with access to the text. All comments will be aggregated and anonymized by Top Hat prior to the authors receiving them. The authors anticipate that the review process will begin by December 2021 and end by April 2022. Potential reviewers may contact Amir Danesh-Yazdi (daneshya@rose-hulman.edu) for more information.



Linking Engineering Students' Professional Identity Development to Diversity and Working Inclusively in Technical Courses

Contributed by Dan Baker

Dan Baker recently co-authored a paper "Linking Engineering Students' Professional Identity Development to Diversity and Working Inclusively in Technical Courses" openly published in the Journal of Civil Engineering Education at <https://ascelibrary.org/doi/full/10.1061/%28ASCE%29EI.2643-9115.0000052>. The paper highlights a diversity-focused activity to design a structural beam as part of a group assignment in Engineering Mechanics: Statics. In addition to the design assignment, students completed pre and post reflection assignments related to the value of diversity in working groups.

Job Opportunities

POSITION ANNOUNCEMENT: Open Rank/Tenure Track Faculty in Mechanical Engineering 2022-2023

Contributed by Sean Moseley

We have recently posted a job ad for a position in the Mechanical Engineering department at Rose-Hulman. The stated focus areas are Dynamic systems and control and/or Material science and manufacturing. See this link for the ad with more details

<https://rosehulman.csod.com/ux/ats/careersite/9/home/requisition/307?c=rosehulman>

Additional News Items

If you have any news items or announcements for the Spring 2022 newsletter, please send them to Nicolas Libre (libren@mst.edu) by April 8, 2022.

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 January 17, 2022)

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 **January 17, 2022**. To submit nominations (or to arrange by mail) or for additional information please contact the Awards Committee Chair Christine Masters at cbm100@psu.edu.

2021 ASEE Mechanics Division Annual Business Meeting Minutes (DRAFT)

Note: A final version will be approved at the 2022 Mechanics Division Business Meeting.
Please forward any needed corrections via email to libren@mst.edu

Meeting Time: Thursday, July 29, 2021, 11:30 am – 1:00 pm PDT

Location: Virtual via Zoom

Attendees: Anna Howard, Brian Self, Chris Venters, Christopher Papadopoulos, Dan Baker, Devin Berg, Dominic Dal Bello, Geoff Recktenwald, Jacob Moore, Jake Bruhl, John Baker, Jonathan Aurand, Nicolas Libre, Jul Davis, Masoud Rais-Rohani, Phil Cornwell, Josue Njock Libii, Lubambala Kabengela, Andrew Sloboda, and Vimal Viswanathan

Call to Order – 11:33 am PDT

1. Welcome/Introductions (Masoud Rais-Rohani – chair)
2. Motion to approve 2021 business meeting minutes – minutes were approved unanimously (no abstentions)
3. Conference Updates (Jul Davis – program chair)
 - 43 abstracts submitted (minus 11 from last year), none rejected
 - 34 papers submitted
 - 5 tagged for diversity
 - 120 reviewers
 - 9 technical sessions & 1 special session
 - Virtual awards social: Charles Radovich (guest speaker); topic: “What it takes to advise a successful competition team”
4. Treasurer’s Report (Jacob Moore)
 - Most up to date balance in BASS account: \$7467.55.
 - Finances are decently normal, and we will actually be up a bit this year because we do not have some of the normal expenses
 - No Pearson or McGraw Hill donations yet (waiting for additional information) – Jul will follow up on this matter
5. Updates from the three committees under the division
 - a. Nominating committee (chair: Devin Berg): No updates to report
 - b. Membership committee (Jeoff Recktenwald on behalf of chair Jennifer Kadowec): No updates to report
 - c. Awards committee (Geoffrey Recktenwald on behalf of chair Christine Masters):
 - Did not receive many nominations, but the ones received were all excellent
 - Jean Batista Abreu of Elizabethtown College and Ramathasan Thevamaran of University of Wisconsin-Madison were selected for Beer and Johnston awards
 - Jul helped with the best paper and best presentation awards
 - Discussion: Is it okay to reduce the size of the plaques for convenient shipping in standard boxes?
 - The committee will decide based on the status of next year’s conference (whether it is online or in-person).

- If the conference is in-person next year, the awardees can be honored in the social event
- Since we have a shortage of nominations this year, the committee urged members to be on the lookout for potential awardees next year.
- This year Dr. Bogdan Epureanu of University of Michigan was awarded the Archie Higdon Distinguished Educator Award sponsored by Pearson. There were two winners for the Beer and Johnston - Outstanding New Mechanics Educators Award sponsored by McGraw Hill. Congratulations to Jean Batista Abreu of Elizabethtown College and Ramathasan Thevamaran of University of Wisconsin-Madison. The 2021 Best Paper Award went to Sarah Wodin-Schwartz, Kimberly LeChasseur and Caitlin Keller of Worcester Polytechnic Institute for their paper titled: Hands On Learning in a Remote Introduction to Statics Classroom Environment. And lastly, our Best Presentation (2020) award went to Amie Baisley of University of Florida and Keith Hjelmstad of Arizona State University for their presentation: The Mechanics Project: A Pedagogy of Engagement for Undergraduate Mechanics Courses.

6. Updates from PIC V chair (Maureen Barcic)

- Updates from board meetings: nominations for awards were way down, ASEE will be more proactive next year regarding nominations and selections for all awards
- ASEE HQ visit requires proof of vaccination
- ASEE will have options to donate to charity while renewing memberships
- Ethics committee – had one reviewer who provided inappropriate comments
- A new committee on scholarly publications: scope will include JEE, AEE and divisional publications
- PIC bylaws were approved for FY 2021
- Distinguished lecture proposal evaluation rubric has been updated
- Interdivisional townhall committee has been formalized and restructured
- Reviewer expectations for the conference have been updated
- 2021 conf updates:
 - 3110 attendees (on par with Tampa – last in-person)
 - 1713 papers
 - 1374 unique authors
 - All programs will be viewable for a year
- 2022: In-person meeting at Minneapolis
 - New paper management system (launch in Sept / Oct)
- Membership in ASEE has declined
- \$600K shortfall from the conference income
 - The organization is still doing okay – the PPP loan has been converted into a grant
- Questions from PIC V for the Mechanics division:
 - Would a “how to” on best paper selections be helpful to you?
 - That would be a nice to have, as long as it doesn’t increase the reviewer’s load
 - Will be helpful for the program chair
 - Would help to make the reviews uniform

- A PIC level rubric has been suggested
- o. Any thoughts that can be taken back to ASEE?
 - a. There should be a better way to label a work in progress paper - currently not transparent to the reviewers - make it automatic if possible
 - b. File names – some way to normalize file names (e.g.: submission #)
 - c. Currently, some of the authors put their last names as file name
 - d. There should be a formal mechanism for feedback on the new paper management system – none exists as of now.
 - e. Committee to recommend guidelines for faculty to respond to student cheating

7. Updates from the 2022 conference preparation (Phil Cornwell): no updates to report

8. Elections

- Program Chair Elect for 2023
 - o Geoff Recktenwald (uncontested, winner by acclimation)
- Director (2 vacancies – 4 year terms until 2025)
 - o Three nominations: Dan Baker, Andrew Sloboda, and Nicolas Libre
 - o Dan Baker and Andrew Sloboda were elected
- Treasurer
 - o Jacob Moore (uncontested, winner by acclimation)
- Secretary
 - o Nicolas Libre (uncontested, winner by acclimation)
- Webmaster
 - o Devin Berg will continue
- Chris Venters and Robert Efimba were appointed to the membership committee
- Chairs of committees were not present, Masoud will contact them by email to see if they would continue
- Diversity Delegates
 - o Christopher Papadopoulos (Ethics)
 - o Chris Venters (DEI)

9. Leadership transition

Adjourn at 1:00 pm PDT

2021 Mechanics Division Awards

The Mechanics Division Annual Awards Banquet was held virtually on June 25, 2021 via ASEE's virtual conference system. After recognizing the award recipients, Dr. Charles Radovich from University of Southern California, presented on "What it Takes to Advise a Successful Competition Team". The Mechanics Division award winners are summarized below:

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

Jean Batista Abreu of Elizabethtown College
Ramathasan Thevamaran of University of Wisconsin-Madison

Archie Higdon Distinguished Educator Award

Bogdan Epureanu of University of Michigan

Mechanics Division James L. Meriam Service Award

Not awarded this year

Mechanics Division 2021 Best Paper Award

Hands On Learning in a Remote Introduction to Statics Classroom Environment
Sarah Wodin-Schwartz, Kimberly LeChasseur and Caitlin Keller of Worcester Polytechnic Institute

Mechanics Division 2020 Best Presentation Award

The Mechanics Project: A Pedagogy of Engagement for Undergraduate Mechanics Courses
Amie Baisley of University of Florida and Keith Hjelmstad of Arizona State University

Congratulations to the Mechanics Division award winners! What a wonderful list of awardees! Keep it up everyone! Don't forget to nominate great educators for next year's Archie Higdon Distinguished Educator Award and Outstanding New Mechanics Educators Award

2020-2021 Mechanics Division Officers and Standing Committees

Chair: Julian Davis, University of Southern Indiana
(812) 461-5489, julian.ly.davis@usi.edu

Program Chair: Phillip Cornwell, US Air Force Academy (2018-22)
(719)333-4396, phil.cornwell@usafa.edu

Program Chair Elect: Geoffrey Recktenwald
(517) 432-3658, GDR@egr.msu.edu

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

Directors: 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
Anna Howard, North Carolina State University (2020-24)
(919) 513-4019, annahoward@annahoward.com
Jakob Bruhl, The United States Military Academy (2020-24)
(845) 938-3131, jakob.bruhl@westpoint.edu
Dan Baker, Colorado State University (2021-2025)
(970) 491-0261, dan.baker@colostate.edu
Andrew Sloboda, Bucknell University (2021-2025)
(570) 577-1861, andrew.sloboda@bucknell.edu

Secretary: Nicolas Libre, Missouri University of Science and Technology
(573) 341-7069, nalibre@mst.edu

Treasurer: Jacob Moore, Penn State Mont Alto
(717) 749-6209, jmoore@psu.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: Carisa Ramming, Chair (carisa.ramming@okstate.edu), Devin Berg, (bergdev@uwstout.edu), Vincent Prantil (prantil@msoe.edu)

Membership Committee: Jennifer Kadowec, Chair (kadowec@rowan.edu), Matthew Jensen (mjensen@fit.edu), Shelley Lorimer (lorimers@macewan.ca), Nicolas Libre (libren@umsystem.edu), Chris Venters (ventersc@ecu.edu).

Awards Committee: Christine Masters, Chair (cbm100@psu.edu), Amir Danesh-Yazdi (daneshya@rose-hulman.edu), Robert Efimba (refimba@howard.edu), Jennifer Holte (jholte@stthomas.edu), Hadas Ritz (hr32@cornell.edu), Sarah Wodin-Schwartz (swodinschwartz@wpi.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

Dan Baker, Colorado State University - Director (2021 - 25)



Dan Baker, Ph.D. PE, is a Teaching Assistant Professor in the Civil and Environmental Engineering Department at Colorado State University. He is one of the primary instructors for both the on-campus and online sections of Engineering Mechanics: Statics and Engineering Mechanics: Dynamics. He is a passionate learner and works to optimize student learning through interactive learning activities, targeted assessments, and elevating student motivation. He learned of his love for teaching as a tour boat captain during his college summers.

Andrew Sloboda, Bucknell University - Director (2021 - 25)



Andrew Sloboda is an Assistant Professor at Bucknell University where he teaches a variety of mechanics-based courses, including statics, solid mechanics, dynamics, system dynamics, and vibration. In the classroom, he is committed to active learning, striving to bring authentic experiences to students via problems and projects. His engineering education research centers on how problem context affects a student's ability to solve problems and transfer learning. His technical research interests lie in the fields of nonlinear dynamics and vibration, where he uses observed changes in dynamic behavior to diagnose system changes.

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 Jul Davis (julian.ly.davis@usi.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.

2022 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, Nicolas Libre (libren@mst.edu), or Division Chair, Jul Davis (julian.ly.davis@usi.edu), before the 2022 Annual Business Meeting.