ASEE AMERICAN SOCIETY FOR ENGINEERING EDUCATION

# Mechanics Division Newsletter

Spring 2016

**Chair:** Christopher Papadopoulos
**Secretary:** Raman P. Singh

Visit the Mechanics Division Website: https://sites.google.com/site/aseemechanicsdivision1929/

## Message from the Chair

Dear Members and Friends of the Mechanics Division,

I am pleased and honored to have served as your Chair for 2015-16. Founded in 1929, our Mechanics Division is one of the oldest within ASEE, and has a long history of serving the engineering mechanics community.

The upcoming Annual Conference in New Orleans June 26-29, 2016 will build off of very successful 2015 program in Seattle, in which we had high and enthusiastic attendance at all of our sessions, particularly the Classroom Demonstrations Session. I sincerely thank all of our authors, reviewers, and moderators for advancing our mission of promoting excellence in scholarship in Mechanics Education. I especially Tom Nordenholz, who served as our previous Chair and worked very hard to bring engaging experiences to our Division. I also congratulate all of our award winners (see p. 4) and thank Brianno Coller, our Program Chair, for organizing an excellent 2016 program!

Please keep in mind the following highlights for the 2016 conference:

- Join us at the **Division Mixer** (U657) on Sunday June 26, 4:15PM – 5:45PM, La Nouvelle Ballroom, Convention Center. This is a great way to meet old friends and new!

- The **Awards Banquet** (T739) will take place Tuesday June 28, 7:00PM – 9:00PM, at Emeril's Delmonico, 1300 St. Charles Ave. Dr. Don Liu of Louisiana Tech University will speak on "Numerical Simulation and Computational Mathematics in Engineering Applications". I thank Vince Prantil, our Program Chair Elect, for organizing this important and fun event. I also thank our sponsors, McGraw Hill and Pearson, for continuing their support of our Awards Banquet, for which we are most grateful. Details p. 5.

- The **Business Meeting** (W439) will take place on Wednesday June 29, 1:15PM – 2:45PM, Room 242 of the Convention Center. Please attend for important updates of Division business, election of new officers, and for opportunities to get involved, and review the minutes from the 2015 meeting (see pp. 11-14).

- The **Mechanics Classroom Demonstrations Session** (T439) will take place on Tuesday June 28, 1:15PM – 2:45PM in Room 264 of the Convention Center. Plan on another fun and engaging experience**!** **There is still time to propose a demonstration** (please contact bcoller@niu.edu directly). Please also remember to visit http://www.handsonmechanics.org/ where you can see many of the demonstrations that have appeared in previous years.

- **Nominations are still being accepted for Division offices** – please see p. 6 for details. In the meantime, I thank all of our officers and committee members for their services, especially

Christine Masters (treasurer), Jacob Moore (co-treasurer) and Raman Singh (secretary) for keeping things moving and in good order.

I would like to call your attention to some other important items that we will discuss further at the Business Meeting:

- As many of you are aware, the ABET Engineering Accreditation Commission (EAC) has **proposed changes to Criteria 3 and 5**. I have enclosed further details on p. 7. Please feel free to comment by contacting me directly at christopher.papadopoulos@upr.edu.

- Dating from last year, the Executive Committee is recommending a **minor change to our Bylaws**, to remove explicit mention of the dues, and leave the dues to be set at the discretion of the board. This change is recommended to give the board further flexibility in offsetting the new indirect costs that ASEE is charging on expenditures. Details p. 6.

- As many of you are aware, ASEE has recently deployed the **PEER Document Repository system** (https://peer.asee.org/). All conference papers from 2015 and later will be assigned a DOI; these and all other papers (since 1996) will be assigned page numbers, permanent URL's, and downloadable citations. These features will greatly improve the visibility, sharing, and documentation of our scholarly works. At the Business Meeting, we will discuss a proposal for the Division to pay a modest fee to ASEE to retrospectively assign a DOI to each paper published and presented through the Division since 1996.

- As I discussed last year, I would like to begin a conversation regarding our Members' views on the curriculum content of the basic mechanics courses with a view toward updating these courses to include modern tools and skills, particularly in the area of simulation and computation. I will initiate a process to solicit your views on the current state of the curriculum, sources you see as driving the curriculum, and changes that you would recommend. See p. 8 for further details.

- Finally, I would also like to expand our Division's role in supporting and sponsoring the use of established assessment and learning tools. In particular, perhaps we can **resurrect the Mechanics Readiness Test** as a means to foster assessment and preparation of students entering Statics. Please let me know if you are interested in this effort, and/or send me recommendations of resources that we could distribute. See p. 8 for further details.

I look forward to seeing as many of you as possible in New Orleans, and please don't hesitate to contact me if you have any questions or comments. I will be available throughout the conference at christopher.papadopoulos@upr.edu or 414-699-4939 (text/call).

Very sincerely,

Christopher Papadopoulos
Associate Professor
Department of Engineering Science and Materials
University of Puerto Rico, Mayagüez
Division Chair, 2015-16

# Comments on the 2016 Mechanics Division Program

Dear members and friends of the Mechanics Division,

I'm looking forward to seeing everyone in New Orleans. This year we have a busy schedule with a total of 34 paper presentations and two posters. This came from a pool of 43 abstracts and 40 draft papers submitted. The result is a high quality program for this year's conference. In making all this work out, I would like to thank the 64 reviewers who contributed their time and expertise, providing valuable advice and feedback to me and to the authors. Several reviewers graciously took on extra duties when I called upon them to provide an extra review as deadlines were looming. I am grateful.

The program, listed in the table below, is organized thematically. There is a session on assessment techniques and tools for measuring learning in mechanics courses. There is a session on homework strategies and problem solving. As usual, there will be sessions on active learning, laboratories, and pedagogy in statics, dynamics, mechanics of materials, and mechanics more broadly. Complete details appear on pp. 15-24.

| | | |
|---|---|---|
| Sunday<br>June 26 | U657 Division Mixer | 4:15 to 5:45, La Nouvelle Ballroom |
| Monday<br>June 27 | M339: Measuring Learning in Statics & Dynamics<br>M439: Homework, Learning, and Problem Solving in Mechanics<br>M539: Active Learning & Labs in Statics, Dynamics, and Mechanics | 11:30 to 1:00, Room 266<br>1:15 to 2:45, Room 354<br>3:00 to 4:30, Room 354 |
| Tuesday<br>June 28 | T339: Mechanics Division Poster Session<br>T439: Mechanics Classroom Demonstrations<br>T539: Teaching & Learning Statics and Mechanics of Materials<br>T739: Mechanics Division Awards Banquet | 11:30 to 1:00, Ex. Hall F<br>1:15 to 2:45, Room 264<br>3:00 to 4:30, Room 354<br>7:00 to 9:00, offsite |
| Wednesday<br>June 29 | W239: Teaching & Learning Dynamics, Vibration, and Mechanics<br>W439: Mechanics Division Business Meeting | 9:45 to 11:15, Room 354<br>1:15 to 2:45, Room 242 |

Back by popular demand, we will have the Classroom Demonstration session on Tuesday afternoon. There will be two regular papers presented at the session, interspersed with demonstrations of your favorite toys, puzzles, laboratory exercises, gimmicks, and other strategies you use to engage students in learning mechanics.

I invite all of you to attend the Mechanics Division Business Meeting on Wednesday afternoon. Registered members are eligible to elect new officers. There will be no food provided at this meeting, but attendees are welcome to bring their own lunch if desired.

If you have any questions or comments about the program, feel free to contact me. See you in New Orleans.
Best Regards,

Brianno Coller
Professor of Mechanical Engineering
Northern Illinois University
Program Chair, 2015-16

# Congratulations to our Recent Mechanics Division Awardees

## Archie Higdon Distinguished Educator Award (Presented at 2015 Conference)

Michael D. Thouless, University of Michigan

## Ferdinand P. Beer and E. Russell Johnston, Jr. Outstanding New Mechanics Educator Award (2014-15)

Matthew J. Jensen, Florida Institute of Technology
Matthew McCarthy, Drexel University

## Best Paper Award (Presented at 2015 Conference)

*A Glimpse into How Students Solve Concept Problems in Rigid Body Dynamics,*
Brianno Coller, Northern Illinois University

## Best Paper Presentation Awards (2015 Conference)

M139: Flipped Classrooms in Mechanics
*Active Learning and Engagement in Mechanics of Solids*
Keri Ryan and Adam Kim, University of Nevada, Reno

M439: Statics Online
*Exploring a New Approach to the Assessment of Web-based Materials for Engineering Statics Courses*
Paul Steif, Carnegie Mellon University, and Anna Dollár, Miami University

M539: Computer Tutors, Simulation, and Videos
*Video Resources and Peer Collaboration in Engineering Mechanics: Impact and Usage Across Learning Outcomes*
Edward J. Berger, Purdue University, and Edward A. Pan, University of Virginia

T239: Dynamics
*Develop a Better Way to Practice to Enhance Students' Experience in Learning Dynamics*
Yan Tang, American Society of Mechanical Engineers; Haiyan Bai, University of Central Florida

T539: Mechanics of Materials
*Torsion Mobile App for Engineering Education Using a High Performance Computer (HPC) Cluster*
Kurt C. Gramoll, University of Oklahoma

W239: Explorations in Mechanics Pedagogy
*Will They Remember? Measured Knowledge Retention Across Statics and Solid Mechanics*
William Graves, Young Hwan Chun, James Ledlie Klosky, and Brock E. Barry, U.S. Military Academy

## Overall Best Paper Presentation (2015 Conference)

*Torsion Mobile App for Engineering Education Using a High Performance Computer (HPC) Cluster*
Kurt C. Gramoll, University of Oklahoma

# Mechanics Division Awards Banquet
# Tuesday, June 16, 7:00pm – 9:00pm (T739)

The Mechanics Division Annual Awards Banquet will take place at Emeril's Delmonico, 1300 St. Charles Ave., 504-525-4937, http://emerilsrestaurants.com/emerils-delmonico. The banquet will feature a talk "Numerical Simulation and Computational Mathematics in Engineering Applications" presented by Dr. Don Liu of Louisiana Tech University.

## Registration

**Sign up early!** Cost: $75 per person pre-registration/$85 on site registration (space permitting). To register, or for more information, contact Vince Prantil (vcprantil@gmail.com). Please also state if you require a vegetarian or vegan option.

## 2015-16 Mechanics Division Award Recipients

The Mechanics Division is pleased to announce the following winners of its 2015-16 awards who will be recognized at the Banquet. Please join us in congratulating these distinguished colleagues.

*Archie Higdon Distinguished Educator Award*

**Ramesh K. Agarwal, Washington University in St. Louis**

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

**Daniel Kawano, Rose-Hulman Institute of Technology**

*Meriam Service Award*

**Not awarded this year**

*Mechanics Division Best Paper Award (2016 Annual Conference)*

**Aldo A. Ferri and Bonnie H. Ferri, Georgia Institute of Technology**

*Blended Learning in a Rigid-Body Dynamics Course Using On-Line Lectures and Hands-On Experiments*

*Mechanics Division Best Presentation Award (2015 Annual Conference)*

**Kurt Gramoll, University of Oklahoma**

*Torsion Mobile App for Engineering Education Using a High Performance Computer (HPC) Cluster*

***Congratulations to all of the winners!***

# Call for Nominees for Division Officers

At the Business Meeting on Wednesday, June 29 the Division will elect new officers for the following positions (all Division Members are eligible):

- **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 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.

- **Awards Committee Members** (appointed): Main Duties: evaluate nominations for Division Awards. Per Article 4.3 of the Bylaws, no voting officer may serve simultaneously as the Awards Committee Chair.

**Submit a nomination to Christopher Papadopoulos (christopher.papadopoulos@upr.edu) prior to the meeting.** Include a brief statement of your current/past involvement in the Division and your interest in serving in the office for which nomination is sought. If a given person is nominated for more than one position, please state preference. Self-nominations and/or multiple nominations are permitted.

# Proposed Changes to Bylaws

The Executive Committee recommends the following changes to the bylaws, which will give more flexibility to adjust the dues. This is particularly important given the new policy for ASEE to charge the Division overhead costs on expenditures. Given the general nature of this change, we understand from the PIC Chair that the approval process can be expedited. We will discuss these changes at the Business Meeting on Wednesday June 29.

### Article 3. Membership (Existing)

The members of this Division are those members of the American Society for Engineering Education who identify to ASEE their wish to be affiliated with the group each year and who pay the division dues of $2 per year.

### Article 3. Membership (Proposed)

The members of this Division are those members of the American Society for Engineering Education who identify to ASEE their wish to be affiliated with the group each year and who pay the division dues. Changes in dues will be approved by a majority vote of the attendees at the Annual Business Meeting.

# Summary and Discussion of Proposed ABET Changes

Christopher Papadopoulos, Chair

As many of you are aware, the ABET Engineering Accreditation Commission (EAC) has proposed changes to Criteria 3 and 5. For your convenience, below is my own meta-summary following my own reading of the Preliminary Summary of ASEE Member Views from the Virtual Conference in March. Detailed comments and explanations are available at https://aseetownhall.wordpress.com/2016-town-hall/. Please review these changes and send me your comments to christopher.papadopoulos@upr.edu. Further discussion will take place at the Interdivisional Town Hall Meeting (M534B Monday June 27, 3:00PM – 4:30PM, Room 345), at a distinguished lecture (W314 Wednesday June 29, 11:30AM – 1:00PM, Room 342), and at the Mechanics Division Business Meeting (W439 Wednesday June 29, 1:15PM-2:45PM, Room 242).

**Criterion 3 "Student Outcomes"** currently consists of the well known 11 outcomes (a)-(k). The proposed changes call for restructuring the outcomes to a list of 7 items. Among other concerns that were raised:

(i) Several of these new items consolidate some of the original outcomes, raising questions as to whether this makes assessment more difficult and/or will require disaggregation to facilitate assessment. [See Preliminary Summary #5]

(ii) Some outcomes have been effectively or substantively eliminated, particularly "multidisciplinary teams" (per outcome d), "knowledge of contemporary issues" (per outcome j), and "broad education" (per outcome h, although this is to a degree relocated in the revised Criterion 5). [See Preliminary Summary #7 and #8]

(iii) The outcome of "life-long learning" (per outcome i) has been narrowed to "ongoing need for additional knowledge" [See Preliminary Summary #7]

(iii) Explicit mention of design constraints such as health, safety, ethics, social, political, etc. (per outcome c) have been moved outside of Criterion 3 and into the revised preamble, striking many that this could be understood as a demotion to something aspirational but not required [See Preliminary Summary #4]. Furthermore, there are some subtle changes in wording from "political" to "policy", "environmental" to "sustainable", etc. [See Preliminary Summary #7]

(iv) The proposed criteria (new outcomes 3 and 5) now explicitly call for "engineering judgment", but without defining what this means. The reviews on this are mixed [See Preliminary Comments #3 and #6]. May I offer my opinion that perhaps our division could suggest a partial definition to this that includes "ability to make useful assumptions, estimates, and approximations".

**Criterion 5 "Curriculum"** appears largely similar, but the explicit mention of "general education" in part (c) is replaced with a statement of "broad education" that is derived from the existing outcome (c). Therefore, the overall impact is an overall deemphasis on general education. The revised statement also eliminates explicit link of broad education and impacts of engineering solutions (per outcome c), and replaces this with a general reference to containing humanities and social sciences. [See Preliminary Summary #7].

Some overall favorable comments include an effort to situate skills in a professional context and an effort to emphasize communication to different audiences. [See Prelimary Summary #1].

# Thoughts on Curriculum Content and Assessment

Christopher Papadopoulos, Chair

If any of you are like me, perhaps you have thought about whether there have been any substantive changes to the curricula of the basic undergraduate mechanics courses (Statics, Dynamics, and Mechanics of Materials) over the last several decades – or if there need to be any. A related question is what drives the content of the curriculum? Tradition? Is there an implicit or explicit requirement to ensure that we cover topics that will appear on the FE Exam (http://ncees.org/engineering/fe/)?

Is there room to update the curricula of these courses to reflect the use of modern tools, such as computation and simulation? Should we set standards for introducing design into these courses? Can our Division have a voice to recommend changes that could, in turn, be reflected in the FE Exam?

As a starting point, I believe it will be useful for us to learn more about we do and would like to do differently in these essential courses. I have in mind questions such as the following:

1. Are there any specific topics that you would recommend adding?
2. Are there any specific topics that you would recommend deleting?
3. What are your current practices on teaching "borderline" topics, such as
    a. 3D rigid body statics and/or space trusses (vs. only 2D)
    b. 3D rigid body dynamics?
    c. Vibrations in Dynamics?
    d. Numerical integration of differential equations in Dynamics?
    e. Virtual work methods in Mechanics of Materials?
    f. Others that come to mind?
4. What are methods that you employ, and which are most effective in your experience?
    a. Inverted/flipped classroom?
    b. Computing, simulation, or apps?
    c. Gaming or real-time feedback learning tutors?
    d. Concept Inventories?
    e. Physical Demonstrations or laboratory work?
    f. Integrating elements of engineering design?
    g. Integrating ethics and social context?
    h. Others that come to mind?
5. Other general comments or questions?

A related topic is assessment. Many members of our Division have developed useful tools for assessment, such as concept inventories.

1. Which assessment tools have you used, and which are most useful in your experience?
2. For which assessment tools would you like to see the Division provide access?
3. Do you give your students a "readiness" test, such as the Mechanics Readiness Test that was developed years ago by members of our Division?
4. Should – and can – the Division to serve as a catalyst to standardize the use of any of these tools, and/or an agent to provide data analysis of results?
5. Other comments?

Please begin to send me your comments and let me know if you would be interested in helping to develop any of these ideas (christopher.papadopoulos@upr.edu).

# Mechanics Division Officer Introductions

**Ning Fang**, Utah State University, Executive Committee Director, (2015-19)

Ning Fang is a Professor in the Department of Engineering Education in the College of Engineering at Utah State University. He earned his PhD (1994), MS (1991), and BS (1988) in mechanical engineering. He has been heavily involved in the Mechanics Division in recent years due to his teaching assignments and research interest in mechanics education, particularly using a variety of modern instructional technologies and active learning strategies to improve student learning in foundational engineering mechanics courses. He served in 2010-2011 as a Program Director in the Division of Undergraduate Education at the National Science Foundation, and has been an active ASEE member for 14 years since 2001.

**Kristi Shryock**, Texas A&M University, Executive Committee Director, (2015–19)

Dr. Kristi Shryock is an Instructional Associate Professor in the Department of Aerospace Engineering and Senior Director of Retention in the Look College of Engineering at Texas A&M University. She received her BS, MS, and PhD from the College of Engineering at Texas A&M. Kristi works to improve the undergraduate engineering experience through evaluating preparation in mathematics and physics, incorporating non-traditional teaching methods into the classroom, and engaging her students with interactive methods. In particular, her research over the last seven years has concentrated on the first-year mathematics and physics mechanics knowledge utilized in a sophomore-level statics and dynamics course and the relationship of this foundational course to retention and ultimately graduation in engineering. She has been active in the Mechanics Division for the last several years as an author, session moderator, and reviewer.

# 2014-15 Mechanics Division Officers and Standing Committees

**Chair:** Christopher Papadopoulos, University of Puerto Rico, Mayagüez
(787) 832-4040 x3336, christopher.papadopoulos@upr.edu

**Past Chair:** Tom Nordenholz, California Maritime Academy
(707) 654-1114, tnordenholz@csum.edu

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

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

**Executive Committee Directors:**
John Baker, University of Kentucky (2012–16)
(270) 534-3114, jbaker@engr.uky.edu
Michael Kozak, University of Dayton (2012–16)
(937) 229-1758, mkozak1@udayton.edu
Devin Berg, University of Wisconsin-Stout (2013–17)
(715) 232-1133, bergdev@uwstout.edu
Jim Papadopoulos, Northeastern University (2013-17)
(617) 373-2982, j.papadopoulos@neu.edu
Masoud Rais-Rohani, Mississippi State University (2014–18)
(662) 325-8430, rais-rohani@bagley.msstate.edu
Carisa Ramming, Oklahoma State University (2014–18)
(405) 744-9056, carisa.ramming@okstate.edu
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

**Secretary:** Raman Singh, Oklahoma State University
(405) 744-5140, raman.singh@okstate.edu

**Treasurer:** Christine Masters, Penn State University
(814) 865.6674, cbm100@engr.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:** Tom Nordenholz, Chair (tnordenholz@csum.edu), Eric Bell (ebell@triton.edu), Anna Dollár (chair, dollara@miamioh.edu)

**Membership Committee:** Jennifer Kadlowec, Chair, (kadlowec@rowan.edu), Shelley Lorimer (lorimers@macewan.ca)

**Awards Committee:** Brian Self, Chair (bself@calpoly.edu), Michael Kozak, mkozak1@udayton.edu), Jim Papadopoulos (j.papadopoulos@neu.edu), Masoud Rais-Rohani (rais_rohani@bagley.msstate.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-oficio (non-voting) elected at each annual Business Meeting for terms of one year. Webmaster and Archivist are ex-oficio (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.

# 2015 Annual Business Meeting Minutes

**ASEE Mechanics Division Business Meeting Minutes**
Wed. June 17, 2015 12:30 PM to 2:00 PM
Seattle Sheraton, Room Cedar B

**Attendance:** John Baker, Eric Bell, Devin Berg, Lia Brillhart, John Burkhardt, Somnath Chattopadhyay, Brianno Coller, Phillip Cornwell, Jul Davis, Ning Fang, Shawn Gross, Ed Howard, Osama Jadaan, Anuja Kamat, Christine Masters, Jacob Moore, Rungun Nathan, Tom Nordenholz, Christopher Papadopoulos, Vince Prantil, Masoud Rais-Rohani, Carisa Ramming, Brian Self, and Kristi Shryock.

**Agenda**

1. Welcome/Introductions (Nordenholz)
2. Approval of 2014 Business Meeting Minutes
    a. Approved
3. Report from Divisions Officers
    a. Chair (Nordenholz)
        a.i. Report from Chair
    b. Program Chair (Papadopoulos)
        b.i. Report on abstracts submitted, accepted and rejected
            b.i.1. 51 abstracts submitted
            b.i.2. 51 abstracts accepted
            b.i.3. 0 rejected
        b.ii. Report on papers submitted, accepted and rejected
            b.ii.1. 37 papers submitted
            b.ii.2. 35 papers accepted (about 50% more than last two years)
            b.ii.3. 2 rejected
        b.iii. Report on how many reviewers
            b.iii.1. 49 reviewers
            b.iii.2. Need some conversation among reviewers to address the greater number of paper submissions
        b.iv. Report on sessions
            b.iv.1. 8 technical sessions (No joint sessions this year)
            b.iv.2. Not practical to do a co-sponsorship this year (with Mechanical Engineering as usual).
            b.iv.3. Could also invite Civil Engineering to co-sponsor.
            b.iv.4. 1 business meeting (executive committee met off site)
            b.iv.5. 1 awards banquet
        b.v. Any other Program Chair related stuff and the paper handling system
            b.v.1. Most sessions were well-attended and standing room only. The regular sessions were at 50–60 and the demonstration session had 80–90 people.
            b.v.2. May ask for 50 person rooms for regular sessions and 100 for the demonstration session.
    c. Program Chair-Elect (Coller)
        c.i. Report on the awards Banquet, number of attendees, amount spent, about the speaker etc.
            c.i.1. 33 Attendees (30 paying)
            c.i.2. $2,250 collected
            c.i.3. $1,944 spent
            c.i.4. Outside sponsorships to offset costs? New sponsor this year, US Didactic. $1,000 for this year. Make someone responsible to develop and nurture this relationship. This could be Tom Nordenholz.

d. Secretary (Singh)
    d.i. Newsletters and other related items—nothing major to report.
e. Treasurer (Masters)
    e.i. For last year (2013-14): Started at $8,970. Get $360 each year in the operating budget, but this has to be spent in the fiscal year. Total starting
    e.ii. Income and dues $780, publisher donations, banquet tickets. Total income of $5,300
    e.iii. Expenses awards plaque, banquet,
    e.iv. We should be about $800 ahead of last year's final numbers. The division does have funds for initiatives moving forward. Some ideas are student papers, sessions (?) for high-school teachers,
    e.v. Report on balance etc. and the current status of the finance of the division
f. Awards Committee (Self)
    f.i. Report on sponsors of awards
        f.i.1. $2000 McGraw-Hill
        f.i.2. $1000 Pearson
    f.ii. Any other award related matters
        f.ii.1. Nominate people for awards. We have not had the nomination for the service award. Long term members of the division could be deserving of the service award. Some discussion on this matter but no consensus. Could be a future action item for discussion.
g. Membership committee
    g.i. No report
        g.i.1. Need to gather membership details from the HQ and report
        g.i.2. Follow up last year's action items
h. Archivist/Hands-on Mechanics Website (Flori/Berg)
    h.i. www.handsonmechanics.org
i. Webmaster (Coller)
    i.i. Nothing to report

4. Announcements and Appointments
    a. Program Chair-Elect 2015-16
        a.i. Vincent Prantil will serve as Program Chair Elect for 2015–16
    b. Membership Committee
        b.i. Chair—Chris Papadopoulos will contact Jennifer Kadlowec
    c. Awards Committee
        c.i. Chair—Tom Nordenholz will contact Brian Self
        c.ii. Members—Masoud will continue to serve as a member; no other changes accepted.
    d. Executive Committee Elections (as nominated and by acclamation)
        d.i. Executive Directors to serve the term 2015–16 through 2018–19.
        d.ii. New directors for 2015–16 through 2018–19: Ning Fang and Kristi Shryock
        d.iii. Secretary for 2015–16: Raman P. Singh
        d.iv. Treasurer for 2015–16: Christine Masters
        d.v. Co-treasurer for 2015–16: Jacob Moore
5. PIC III Report (Sheryl Sorby)—12:37 pm.
    a. Can we not have the business meeting on Wednesday at noon to not conflict with the Board Meeting?
    b. Three board meetings (January and x2 at Annual Meeting in June)—need to get changes in bylaws one month before any of the three board meetings. Also true for change of dues? This year changes in dues might be in an expedited manner.
    c. Special Projects Fund is $5,000. Apply. Need a match. Last year 12–13 awarded for average of $400

d. Best paper for PIC III also best paper for overall conference.
e. Elimination of paper fees (based on feedback from last year).
f. Negotiation of reasonable WiFi rate. Contracts for conferences are about 6 years in advance so no immediate changes.
g. Improvements to Monolith.
h. "Strategic Doing" session. Year long process. Can get involved, especially if interested in long term vision of ASEE. Contact Sheryl.
i. 6 Diversity Best papers. Two from PIC III
j. Plan for year in action on P-12 Engineering. Probably in 2017 or 2018. Start planning. Say High School Statics.
k. No current intention to raise member fees/dues. Also hoping to keep conference fees stable.
l. Opportunities for reduced fees. Say life-term membership. Multi-year renewals save about 5% per year
m. Financial difficulties at ASEE.
    m.i. Operating at a deficit for at least 5 years. Not clear how long.
    m.ii. Long time CFO for ASEE passed away about 5 years ago.
    m.iii. Last year hire of CFO has found problems with budgets and
    m.iv. FY2014 $1.2M deficit. Accounting for debt. One time charge.
    m.v. Did pass a current balanced budget. Increased revenue and decreased expenses. Former from institutional membership fees. (What Deans pay—did work with the Deans' Council). $1,200 to $3,500. Latter at the HQ level and should not impact divisions.
    m.vi. The BASS accounts will be affected, however. Effective October 1 everything incoming will be subjected to an overhead fee of 30%. No fees applied to current funds being held or funds that will be disbursed. Only to new revenues. This was voted on and passed at the Sunday board meeting. Don't know final details. For example, would this cover banquet tickets? Will cover mostly dues and publisher donations.
    m.vii. Question from Tom: How are other divisions responding?
        m.vii.1. Raising dues
n. Question regarding the Monolith system (Chris Papadopoulos).
    n.i. Can we add author bios after the final acceptance/submissions? Yes, through having bios listed separately from the paper submission process.
    n.ii. Blind conversation between reviewers? Especially if a paper is resubmitted then it should go back to all the reviewers. (Even if they choose not to look at it). Also, be able to see other reviewers' comments for resubmissions.
    n.iii. Some windows show paper number and paper title, some don't. Like consistency and redundancy.
    n.iv. Have the author submit a point-by-point response to the review. This can be done as a Program Chair.
o. Common times for division business meetings?
    o.i. Discussed pros and cons.
    o.ii. Brought up by Rungun Nathan

6. New Business
    a. Increase in dues (Tom Nordenholz)
        a.i. 30% reduction in incoming revenue to the division. Proposed the idea of increasing dues from $2 to $3 per member per year.
            a.i.1. Motion (Jacob Moore) and second (Jul Davis). So moved.
    b. Award guidelines—honorarium versus waiver of registration fees
        b.i. Some awards provide registration and banquet. The former is frowned upon by ASEE HQ.

b.ii. Each of the three awards will yield about $700 of which the plaque is $150. That leaves $550. Make it a $500 honorarium, two tickets to the banquet and a plaque.
    b.ii.1. Rungun Nathan moved and Christine Masters seconded. So approved.
b.iii. For the James L. Meriam service award, perhaps just the recognition with a plaque and not an honorarium and two tickets to the banquet. Currently, the award does provide registration to the conference.
    b.iii.1. Could contact Glenn Kraige to contact Wiley.
    b.iii.2. Motion (Jul Davis): $500+2 tickets+plaque; Second (John Burkhardt). Passed.
b.iv. Initiative on membership. Could approach community colleges. Lot of mechanics is now taught at community colleges.
    b.iv.1. Email the members of the 2-year college committee to identify those who teach mechanics.
    b.iv.2. Contact American Association of Junior and Community Colleges.
b.v. Need for more assessment data or something innovative to share in papers as brought up by Chris Papadopoulos.
    b.v.1. Some debate but no change to be made for now.
    b.v.2. The program chair has the discretion to change from a paper to a poster. This is as per ASEE.
b.vi. Survey of the membership (Chris Papadopoulos)
b.vii. Invest money by buying a Dropbox account to upload videos and photographs. Will have more details at a later stage.
b.viii. Scheduling the meeting just before the banquet.

7. Passing of the Banner (Nordenholz)
8. Adjourn (Papadopoulos)—2:18 pm.

# 2016 Mechanics Division and Plenary Schedule

## Sunday June 26, 2016

**Various workshops 9:00AM – 12:00PM, 9:00AM – 4:00PM, or 1:00PM – 4:00PM. See general schedule.**

---

**U557 - Greet the Stars (First-timers' Orientation)**
**Time:** 3:15 p.m. - 4:00 p.m.
**Location:** New Orleans Convention Center

Calling all first-time ASEE conference participants! Not sure how to navigate the event? Overwhelmed by the myriad of sessions? Want to know how to get the best out of your experience?

This session is facilitated by the current and past Vice Presidents for Member Affairs and other Board Members, and will offer suggestions for successful participation in ASEE.

---

**U657 - Division Mixer**
**Time:** 4:15 p.m. - 5:45 p.m.
**Location:** New Orleans Convention Center
One of our most popular events!
The Division Mixer kicks off the conference with music, drinks, food, and colleagues. This event is both a networking opportunity and a chance for divisions to showcase and promote themselves to prospective members. Tables staffed by participating divisions may feature contests and prize giveaways.

This event is complimentary for all attendees.

---

**U759A - Focus on Exhibits: Welcome Reception**
**Time:** 6:00 p.m. - 7:30 p.m.
**Location:** New Orleans Convention Center

Join your colleagues at the Grand Opening of the Exhibit Hall, immediately following the Division Mixer (above). Our exhibit hall is packed with exciting products, solutions, and technologies, with new and exciting content year after year. Roam the expansive space while enjoying refreshments, catching up with old friends, and making new ones.

This event will feature complimentary beer & wine and refreshments.

This event is complimentary for all attendees.

---

**U759E, M759, T759 - New This Year! Dinner Club**
**Dates:** Sunday, June 26, 2016, Monday, June 27, 2016, Tuesday, June 28, 2016
**Time:** 7:00pm - 9:00pm

**Free ticketed event!** First time attendee? Traveling on your own? Know of a good restaurant in New Orleans you want to tell people about? Meet up with your colleagues at the info kiosk at 7:00 pm and then head to dinner! Dinner selections are up to the individuals gathering at the Kiosk, and all diners are expected to cover the cost of their own meals.

Enjoy!

**U759C - NEW THIS YEAR! ASEE Charity Casino Night**
**Time:** 8:00 p.m. - 11:00 p.m.
**Location:** New Orleans Convention Center, La Nouvelle Ballroom

New this year!

The First Ever ASEE Charity Social

Join your friends and colleagues as this special social event as we dance to the beat of New Orleans.

This special event will feature a Silent Auction and you can even try your luck at the Casino Tables where you can win a chance for fabulous prizes.

All proceeds go to support the ASEE Give Back Campaign for Cafe Hope and STEM NOLA.

Light refreshments, including beer & wine, will be served.

Complimentary for all attendees

---

## Monday June 27, 2016

**M157 Monday Plenary**
**Time:** 8:00 a.m. - 9:30 a.m.
**Location:** New Orleans Convention Center

**Lisa Jackson is Apple's vice president of Environment, Policy and Social Initiatives, reporting to CEO Tim Cook.**

Lisa oversees Apple's efforts to minimize its impact on the environment by addressing climate change through renewable energy and energy efficiency, using greener materials, and inventing new ways to conserve precious resources. She is also responsible for Apple's education policy programs such as ConnectED, its product accessibility work, and its worldwide government affairs function.

From 2009 to 2013, Lisa served as Administrator of the U.S. Environmental Protection Agency. Appointed by President Barack Obama, she focused on reducing greenhouse gases, protecting air and water quality, preventing exposure to toxic contamination, and expanding outreach to communities on environmental issues. She has also served as Chief of Staff to New Jersey Governor Jon S. Corzine and as Commissioner of New Jersey's Department of Environmental Protection. Lisa holds a master's degree in Chemical Engineering from Princeton University and a bachelor's degree in Chemical Engineering from Tulane University. She serves on the boards of Princeton, Tulane, and the Clinton Foundation.

---

**M259B Focus on Exhibits: Brunch**
**Time:** 9:45 a.m. - 11:15 a.m.
**Location:** New Orleans Convention Center, Exhibit Hall F

Our exhibitors welcome you back for food and drink to start the day. Whether it's a NASCAR, 3-D printer, or quality textbooks for your classes, you'll likely find something interesting in the hall.

This event is complimentary for all attendees.

---

**M359B - 2016 ASEE Annual Awards Ceremony and Lunch**
**Time:** 11:30 a.m. - 1:00 p.m.
**Location:** Marriott Convention Center, Ballroom

ASEE offers awards in a variety of areas, from best paper, to teaching recognition, to professional and technical honors, to a lifetime achievement award. This event showcases some of ASEE's best and brightest.

This event is complimentary for award winners and their guest, others can attend for $50.

---

**M339 Measuring Learning in Statics & Dynamics**
**Time:** Mon. June 27, 2016 11:30 AM to 1:00 PM
**Location:** Room 266, New Orleans Convention Center
**Session Description:** In order to know whether instructional interventions impact learning, you have to be able to measure it objectively. The session features papers that discuss development of and use of instruments to measure learning in mechanics courses.
**Moderated by:** Kristi Shryock

**Enhancing Mechanics Education through Shared Assessment**
Prof. Roger G. Hadgraft (University of Technology Sydney), Prof. David Lowe (The University of Sydney), and Ms. Justine Lawson (Affiliation unknown)

**Preliminary Analysis of Spatial Ability Improvement within an Engineering Mechanics Course: Statics**
Steven David Wood (Utah State University - Engineering Education), Dr. Wade H Goodridge (Utah State University), Mr. Benjamin James Call (Utah State University - Engineering Education), and Thayne L Sweeten Ph.D. (Department of Biology, Utah State University)

**Development of an Alternative Statics Concept Inventory Usable as a Pretest**
Dr. Christopher Papadopoulos (University of Puerto Rico, Mayaguez Campus), Dr. Aidsa I. Santiago Roman (University of Puerto Rico, Mayaguez Campus), Mr. Manuel Jose Perez-Vargas (University of Puerto Rico, Mayaguez Campus), Dr. Genock Portela-Gauthier (University of Puerto Rico, Mayaguez Campus), and Wadson C Phanord (University of Puerto Rico, Mayaguez)

**Analyzing an Abbreviated Dynamics Concept Inventory and Its Role as an Instrument for Assessing Emergent Learning Pedagogies**
Mr. Nick Stites (Purdue University, West Lafayette), David A Evenhouse (Purdue University), Mariana Tafur (Purdue University, West Lafayette), Prof. Charles Morton Krousgrill (Purdue University, West Lafayette), Craig Zywicki (Purdue University), Dr. Angelika N Zissimopoulos (University of Chicago), Dr. David B Nelson (Purdue University, West Lafayette), Prof. Jennifer DeBoer (Purdue University, West Lafayette), Prof. Jeffrey F Rhoads (Purdue University, West Lafayette), and Dr. Edward J. Berger (Purdue University, West Lafayette)

**Mapping Conventional Teaching Methods and Learning Styles in Engineering Dynamics**
Dr. Meera NK Singh P.Eng (University of Calgary), Dr. Leszek Sudak P.Eng. (University of Calgary), and Dr. Philip Egberts P.Eng. (University of Calgary)

**Using Concept Maps to Illustrate the Evolution of Key Concepts: Student Learning Experience in a Foundational Undergraduate Engineering Course**
Prof. Ning Fang (Utah State University)

---

**M439 Homework, Learning, and Problem Solving in Mechanics**
**Time:** Mon. June 27, 2016 1:15 PM to 2:45 PM
**Location:** Room 354, New Orleans Convention Center
**Session Description:** Good instructors engineer effective learning experiences for their students. The session features six papers which examine the structure of homework, utilizing electronic resources, and working through misconceptions.

Subjects include statics, dynamics, and mechanics of materials.
**Moderated by:** Dr. Geoff Rideout

**Can Enforcing an Organized Solution Lead to Better Grades?**
Dr. Julian Ly Davis (University of Southern Indiana) and Dr. Thomas McDonald (University of Southern Indiana)

**A Laboratory Study of Student Usage of Worked-example Videos to Support Problem Solving**
Dr. Edward J. Berger (Purdue University, West Lafayette) and Prof. Michael Wilson (Purdue University, West Lafayette)

**Homework Methods in Engineering Mechanics, Part Two**
Dr. Robert O'Neill (Florida Gulf Coast University), Dr. Ashraf Badir P.E. (Florida Gulf Coast University), Dr. Long Duy Nguyen (Florida Gulf Coast University), and Dr. Derek James Lura PhD (Florida Gulf Coast University)

**Open-source, Online Homework for Statics and Mechanics of Materials Using WeBWorK: Assessing Effects on Student Learning**
Dr. Michael K. Swanbom PE (Louisiana Tech University), Dr. Daniel William Moller (Louisiana Tech University), Dr. Katie Evans (Louisiana Tech University), and Dr. Timothy Reeves (Louisiana Tech University)

**Improving Students' Learning in Statics Skills: Using Homework and Exam Wrappers to Strengthen Self-regulated Learning**
Kai Jun Chew (Stanford University), Dr. Helen L. Chen (Stanford University), Beth Rieken (Stanford University), Autumn Turpin (Stanford University), and Dr. Sheri Sheppard (Stanford University)

**Misconceptions in Rolling Dynamics: A Case Study of an Inquiry-based Learning Activity**
Dr. Gina C Adam (National Institute of Microtechnologies, Romania), Dr. Brian P. Self (California Polytechnic State University, San Luis Obispo), Dr. James M Widmann (California Polytechnic State University, San Luis Obispo), Michael George (Student- California Polytechnic State University), Mr. Benjamin Kevin Kraw (California Polytechnic State University: San Luis Obispo, Undergraduate Mechanical Engineering Student), and Miss Lindsey Chase (California Polytechnic State University, San Luis Obispo)

---

**M534B Interdivisional Town Hall on the Proposed Changes to the ABET Accreditation Criteria**
**Time:** Mon. June 27, 2016 3:00 PM to 4:30 PM
**Location:** Room 345, New Orleans Convention Center
**Session Description:** In 2009, ABET's Engineering Accreditation Commission's (EAC) Criteria Committee convened a task force to systematically assess, evaluate, and recommend improvements to Criterion 3 of ABET's Engineering Accreditation Criteria. The EAC has acted on their Criteria Committee's recommendations, and has advanced these proposed changes for public comment. The 2016 Interdivisional Town Hall Meeting at our annual meeting in New Orleans is organized around collecting ASEE member views regarding the proposed changes. All ASEE members are invited to attend.

Moderated by Dr. Atsushi Akera and Ms. Catherine Didion

---

**M539 Active Learning & Laboratories in Statics, Dynamics, and Mechanics**
**Time:** Mon. June 27, 2016 3:00 PM to 4:30 PM
**Location:** Room 354, New Orleans Convention Center
**Session Description:** Research has shown that students learn best when they are actively engaged in the process. This session features six papers which present strategies and activities designed to engage students.
**Moderated by:** Prof. Aldo "Al Ferri" A. Ferri

**Design a New Set of Strength Labs for the Course, 'Mechanics of Materials'**
Dr. Xiaobin Le P.E. (Wentworth Institute of Technology), Prof. Masoud Olia P.E. (Wentworth Institute of Technology), Prof. Ali Moazed (Wentworth Institute of Technology), and Prof. Richard L Roberts (Wentworth Institute of Technology)

**End Fixture Design to Enhance Column Buckling Lesson**
Dr. Randy Dean Kelley P.E. (University of Pittsburgh, Johnstown), Prof. Brian E Moyer (University of Pittsburgh, Johnstown), and Prof. Roelof Harm deVries P.E. ()

**Scaling Up Project-based Learning for a Large Introductory Mechanics Course Using Mobile Phone Data Capture and Peer Feedback**
Mr. John W. Sanders (University of Illinois, Urbana-Champaign), Prof. Matthew West (University of Illinois, Urbana-Champaign), and Dr. Geoffrey L Herman (University of Illinois, Urbana-Champaign)

**Hands-on Project Strategy for Effective Learning and Team Performance in an Accelerated Engineering Dynamics Course**
Dr. Anu Osta (Rowan University) and Dr. Jennifer Kadlowec (Rowan University)

**Development of a Low-cost, Two-Degree-of-Freedom Spring-Cart System and System Identification Exercises for Dynamic Modeling**
Benjamin David McPheron (Roger Williams University), Joseph D Legris (Roger Williams University School of Engineering, Computing and Construction Management), Charles Flynn (Affiliation unknown), Mr. Aidan James Bradley (Roger Williams University), and Mr. Ethan Thomas Daniels (Roger Williams University)

**Assessment of Retention Where Students Create and Teach Laboratory Experiments through a Capstone Project**
Dr. Daniel J. Magda (Weber State University)

---

**M659 - Focus on Exhibits: Summertime Social**
**Time:** 4:30 p.m. - 5:30 p.m.
**Location:** New Orleans Convention Center, Exhibit Hall F

Nothing says summer like a refreshing glass of sweet, cold lemonade. Escape the hot June temps and see what's "hot" on the Exhibit Hall Floor.

This event is complimentary for all attendees.

---

## Tuesday June 28, 2016

**T257 Tuesday Plenary**
**Time:** 9:45 a.m. - 11:15 a.m.
**Location:** New Orleans Convention Center, La Nouvelle Ballroom

Join your friends and colleagues as we recognize the 2015 Best Overall PIC, Zone, and Diversity Paper Winners and the 2016 Most Outstanding Teaching Award winner.

**Most Outstanding Teaching Award Winner**

For exhibiting excellence in undergraduate teaching at all levels, for exceptional academic advising, for the development of an accredited undergraduate curriculum in Biomedical Engineering, and for service to the profession through leadership and mentoring.

**Dr. Mary C. Verstraete**

Dr. Verstraete is an Associate Professor in Biomedical Engineering, completing her 28th year at The University of Akron in May 2016. She has risen through the ranks from Assistant Professor to Associate Professor and now also holds the title of Associate Chair for the Undergraduate Program in BME due to her hard work and dedication to the undergraduate program in Biomedical Engineering which has been accredited since 2001.

**Best Overall PIC Paper:** PIC III "Which Courses Influence Engineering Students' Views of Social Responsibility?"

*Authors:* Nathan E Canney, Seattle University; Angela R Bielefeldt, University of Colorado; Mikhail Russu, Seattle University

**Best Overall Zone Paper:** Zone III "Correlating Engineering Statics Student Performance with Scores of a Test over Pre-requisite Material Involving Problem Solving"

*Authors:* Roy Myose, Wichita State University; Syed Raza, Wichita State University; Klaus Hoffmann, Wichita State University; Armin Ghoddoussi, Wichita State University

**Best Diversity Paper:** "Creating Inclusive Environments in First-Year Engineering Classes to Support Student Retention and Learning

*Authors:* Christina H. Paguyo, Colorado State University; Rebecca A Atadero, Colorado State University; Karen E. Rambo-Hernandez, West Virginia University; Jennifer Francis, West Virginia University
Also featured is our CMC Keynote Speaker: Joseph Bradley!

Joseph Bradley is president for business ventures at Uptake, a Chicago-based data analytics start-up. A noted expert on the Internet of Things, he joined Uptake after more than 20 years in the service provider, software, and technologies industries, serving as the vice president of Cisco's Internet of Everything (IoE) Practice. He was also senior research fellow for the Global Center for Digital Business Transformation. In these roles, Bradley led a multidisciplinary and synergistic team of innovation, technology, research, economics, communications, and thought-leadership experts who were uniquely qualified to assist CXOs, government leaders, and their teams in transforming their digital organizations by leveraging the four components of IoE—people, process, data, and things.

---

**T339 Mechanics Division Poster Session**
**Time:** Tue. June 28, 2016 11:30 AM to 1:00 PM
**Location:** Exhibit Hall F, New Orleans Convention Center

**A Practical Guide to Graphical Statics**
Casey Allen Halbmaier (University of St. Thomas), Dr. Sarah Baxter (University of St. Thomas), Dalton Irving Humphrey (Affiliation unknown), and Dr. Bethany Fralick (University of South Carolina - Aiken)

**Development of Plane Stress-Strain Analysis Software for Mechanics of Material**
Dr. Hirohito Kobayashi (University of Wisconsin - Platteville)

---

**T439 Mechanics Classroom Demonstrations**
**Time:** Tue. June 28, 2016 1:15 PM to 2:45 PM
**Location:** Room 264, New Orleans Convention Center
**Session Description:** This popular session will feature live demonstrations that creative mechanics instructors use in their classrooms. It will also feature two relevant paper presentations and an introduction to the Hands On Mechanics website which provides a forum for educators to exchange ideas.
**Moderated by** Dr. Brianno D Coller
**Speaker:** Dr. Devin Berg**,** University of Wisconsin, Stout.

Dr. Berg is an Assistant Professor and Program Director of Manufacturing Engineering in the Engineering and Technology Department at the University of Wisconsin - Stout. Additioinally, he is the web master of the Hands On Mechanics web site: www.handsonmechanics.org.

**Manipulatives in Engineering Statics: Supplementing Analytical Techniques with Physical Models**
Dr. Joel Alejandro Mejia (Angelo State University), Dr. Wade H Goodridge (Utah State University), Mr. Benjamin James Call (Utah State University - Engineering Education), and Mr. Steven David Wood (Utah State University)

**Blended Learning in a Rigid-Body Dynamics Course Using On-Line Lectures and Hands-On Experiments**
Prof. Aldo A. Ferri (Georgia Institute of Technology) and Dr. Bonnie H. Ferri (Georgia Institute of Technology)

---

**T539 Teaching & Learning Statics and Mechanics of Materials**
**Time:** Tue. June 28, 2016 3:00 PM to 4:30 PM
**Location:** Room 354, New Orleans Convention Center
**Session Description:** The six papers featured in this session discuss strategies and techniques for teaching and learning statics and mechanics of materials.
**Moderated by** Dr. Yan Tang

**Teaching Virtual Work without the Abstract Concepts**
Dr. Barry T. Rosson P.E. (Florida Atlantic University)

**Graphical Statics Redux**
Dr. Sarah Baxter (University of St. Thomas) and Dr. Bethany Fralick (University of South Carolina, Aiken)

**Self-paced, Problem-solving Approach to Teaching Finite Element Analysis in Strength of Materials**
Dr. Anne Raich (Lafayette College)

**Effectiveness of Flipped Classroom for Mechanics of Materials**
Andrew Lee (Arizona State University), Dr. Haolin Zhu (Arizona State University), and Prof. James A Middleton (Arizona State University)

**Analogy Methods to Address Warping and Plasticity in Torsion**
Prof. Somnath Chattopadhyay (University at Buffalo, SUNY)

**Engineering Students Understand the Elastic Neutral Axis, but What About the Plastic Neutral Axis?**
Prof. Shane M Palmquist (Western Kentucky University)

---

**T739 Mechanics Division Awards Banquet**
**Time:** Tue. June 28, 2016 7:00 PM to 9:00 PM
**Location:** Emeril's Delmonico, 1300 St. Charles Ave.
**Session Description:** Ticketed event: $75.00 advanced registration and $85.00 on site registration. Come have a nice meal with fellow educators of statics, dynamics, and all types of mechanics. In addition, we will honor awardees, including best paper and presentation.

---

## Wednesday June 29, 2016

**W239 Teaching & Learning Dynamics, Vibration, and Mechanics More Broadly**
**Time:** Wed. June 29, 2016 9:45 AM to 11:15 AM
**Location:** Room 354, New Orleans Convention Center
**Session Description:** The session features six papers which discuss strategies, techniques, and general principles for teaching and learning mechanics.
**Moderated by** Dr. Ji-Chul Ryu

**Understanding the Effects of Transferring In Statics Credit on Performance in Future Mechanics Courses**
Dr. Jacob R Grohs (Virginia Tech), Ms. Michelle M Soledad (Virginia Tech, Ateneo de Davao University), Dr. David B Knight (Virginia Tech Department of Engineering Education), and Prof. Scott W Case (Virginia Tech)

**Scaffolding through Question Prompts to Avoid Pernicious Einstellung (Set) Effect**
Dr. Yan Tang (Embry-Riddle Aeronautical Univ., Daytona Beach)

**Pre- and Post-Class Student Viewing Behaviors for Recorded Videos in an Inverted Sophomore Mechanics Course**
Dr. Shawn P. Gross (Villanova University) and Dr. David W Dinehart (Villanova University)

**Combining Ordinary Differential Equations with Rigid Body Dynamics: Teaching a Second-year Engineering Dynamics Course to Two-year College Graduates**
Dr. Roes Arief Budiman P.Eng. (University of Calgary) and Vishash Kumar Sharma (Affiliation unknown)

**Challenges and Logistics in Flipping a Large Classroom for Junior-year Mechanical Vibrations**
Dr. Geoff Rideout (Memorial University of Newfoundland)

**An Analysis of Recipe-based Instruction in an Introductory Fluid Mechanics Laboratory**
Dr. Blake Everett Johnson (University of Illinois at Urbana-Champaign) and Jason W Morphew (University of Illinois at Urbana-Champaign)

---

**W314 – Distinguished Lecture: "Mind the Gap: What the ABET Crisis Can Teach Us about Connecting Research and Practice"**
**Time:** 11:30 a.m. - 1:00 p.m.
**Location:** New Orleans Convention Center, 342

**Description:** The process of deliberation for ABET's proposed changes to accreditation criteria 3 and 5 began in 2009 but has followed a path far more opaque to ASEE members than the deliberations on EC 2000 in the 1990s, with most members and ASEE leaders learning of the proposal only in June 2015.

Changes to criterion 3 narrowly redefine professional skill attainment in ways that are at odds with numerous blue ribbon reports over the past two decades that call for increased emphasis on engineers' professional capabilities. The new learning outcomes in criterion 3 eliminate altogether skills such as lifelong learning, working across disciplines, and understanding political contexts of engineering work. Other outcomes such as global, environmental, and societal competencies no longer represent an outcome unto themselves but are now relegated to - and risk being conflated with - the limited context of engineering ethics.

Perhaps the most sweeping change is a tiny edit to criterion 5 that dispenses with the requirement that "adequate attention and time" be given to educational breadth. At stake here is nothing less than engineers' development of intellectual power built across disciplines, which enables critical thinking and reflective action expected of responsible and versatile professionals.

ABET has not effectively communicated evidence supporting the rationale behind these changes; documents available on ABET's website point to some unsupported perceptions, inconsistent with the literature, that particular outcomes are difficult to assess, and that collapsing outcomes into a smaller number will somehow spur innovation. This mentality betrays best assessment practices, which might instead suggest improving the training that ABET evaluators receive in assessment, or innovating new assessment methods where they are shown to be needed.

The fact that ABET's actions run counter to the engineering education literature and national STEM policy priorities underscores the critical consequences of the well-known, but not yet well addressed, research-to-practice gap in engineering education. This talk will motivate and describe in detail a proposed move from Disciplinary-Based Education Research (DBER) to Relational Organizing - Action Research (ROAR), which represents a more proactive and engaged effort to move engineering education ideas within traditional engineering disciplines. ROAR is developed from a combination of previously proven techniques in education (Participatory Action Research) and social change (Relational Organizing) and promises a viable path to ensuring key qualities for future engineers are valued and assessed properly.

**Speakers:** Dr. Donna M. Riley, Virginia Tech

---

**W333 – Distinguished Lecture: "Engineering a School Turnaround: How One School Went From Failing to Flourishing with a Fresh Focus on Engineering Education"**

**Speakers:**
Mrs. Emily Hardee, Brentwood Magnet Elementary School

Ms. Elizabeth A. Parry, North Caroline State University

---

**W333 – Distinguished Lecture: "Bringing Visibility to Engineering Education" - Presented by National Instruments**

**Speakers:** Dave Wilson, National Instruments, Vice President of Product Marketing, Academic

In our innovation-driven world, rate of discovery matters. While researchers are discovering what no one knows, in the classroom, students are discovering what they don't know—the behavior of signals and circuits within complex electromechanical systems. It's the rate of discovery, of gaining true understanding, that impacts in-depth learning, as well as long-term engagement. To achieve real results, fast, we must give students direct visibility into the inner workings of the complex systems they're aiming to understand and build. The faster students can find problems, the faster they can create innovative solutions. At National Instruments, we work with an ecosystem of partners and products to provide powerful tools of instrumentation, tools of discovery. Hear from Dave Wilson, Vice President of Product Marketing for Academics, on methods of discovery for the engineering classroom.

---

**W357B - 2015 Best PIC & Best Zone Paper Presentations**
**Dist. Lecture: ASEE Board of Directors**
**Best PIC Papers:**

**PIC I**
Title: Comparing Pedagogical Strategies for Inquiry-based Learning tasks in a Flipped Classroom Author: Milo Koretsky, Oregon State University; Samuel Alexander Mihelic, Oregon State University; Margot Vigeant, Bucknell University; Katharyn E Nottis, Bucknell University; Michael Prince, Bucknell University

**PIC II**
Title: The Impact of Teaming and Cognitive Style on Student Perceptions of Design Ideation Outcomes
Author: Kathryn Jablokow, Pennsylvania State University; Wesley Teerlink, Pennsylvania State University; Seda Yilmaz, Iowa University; Shanna R. Daly, University of Michigan; Eli M. Silk, The State University of New Jersey

**PIC IV**
Title: Hybrid Learning Style
Author: Quintana Clark, Purdue University, West Lafayette; Alejandra Magana, Perdue University, West Lafayette

**PIC V**
Title: The Path from Industry Professional to Assistant Professor
Author: Mark Angola, East Carolina University; Leslie Pagliari, East Carolina University; James Kirby, Eastern Kentucky University School of Business
Best Zone Papers:

**Zone I**
Title: A Deeper Understanding of Technology is Needed for Workforce Readiness – Playing Games, Texting, and Tweets Aren't Enough to Make Students Tech-Savvy
Author: Teresa Piliouras, Best We Can Be Inc.; CoAuthors: Raymond Yu, AITE High School; Kristen Villanueva, AITE High School; Yingxin Chen, AITE High School; Holly Robillard, AITE High School; Michael Berson, AITE High School; Jeanne Lauer, AITE High School; Garrett Sampel, AITE High School; Daniel Lapinski, AITE High School; Maigh Attre, AITE High School

**Zone II**
Title: The Da Vinci Foundry: A Powerful Learning and Thinking System to Develop the 21st Century Renaissance Engineer

Authors: Pedro E. Arce, Tennessee Technological University; Joseph Biernaki, Tennessee Technological University; J. R. Sanders, Tennessee Technological University; J. Pascal, Tennessee Technological University

**Zone IV**
Title: HSI STEM: Research Opportunities to Improve Retention and Increase the Pipeline to Graduate School
Author: Gino Galvez, California State University, Long Beach; Eric Marinez, California State University, Long Beach; Alvaro Monge, California State University, Long Beach

---

**W439 Mechanics Division Business Meeting**
**Time:** Wed. June 29, 2016 1:15 PM to 2:45 PM
**Location:** Room 242, New Orleans Convention Center
**Session Description:** Annual Business Meeting of the Mechanics Division, including election of new officers. All Division members are invited as voting participants; all others are invited as guests.

---

**W534B Meeting for Incoming/Current Program Chairs & Division Chairs**
**Time:** Wed. June 29, 2016 1:15 PM to 2:45 PM
**Location:** Room 261, New Orleans Convention Center
**Session Description:** Meeting for Incoming/Current Program Chairs & Division Chairs

---

**W757 ASEE President's Farewell Reception**
**Time:** 6:00 p.m. - 7:30 p.m.
**Location:** New Orleans Convention Center, La Nouvelle Ballroom

Free ticketed event

Join ASEE President Joe Rencis as he passes the gavel to incoming President Louis Martin-Vega Join your friends and colleagues as we say goodbye to New Orleans and look forward to Columbus!
Light refreshments will be served.

This session is complimentary for all attendees.

---

*At each session, please be sure to complete the evaluation forms and give them to the session moderator.* ***Completion of evaluation forms enables the determination of awards for best presentations.*** *The complete ASEE Program Online Session Locator is available at* **http://www.asee.org/osl.**

---