



# Mechanics Division

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## *NEWSLETTER*

Spring 2008

Chair: Timothy A. Philpot  
Secretary: Phil Cornwell

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Visit the Mechanics Division Website <http://comp.uark.edu/~jjrencis/aseemechanics/>

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### Message From the Chair

Dear Mechanics Educators:

Greetings to all Mechanics Division members and friends! I hope that your academic year has been a satisfying one. While I am sure that your summer will be busy with both personal and professional plans, I hope that many of you will be attending the 2008 ASEE Annual Conference and Exposition in Pittsburgh, Pennsylvania, a lovely city banked on all sides by water and lush green hills. Many of you may have already registered, but if you've procrastinated, I would like to encourage you to finalize your plans soon. The dates for this year's conference are June 22-25, and advance registration is open until May 28<sup>th</sup>. For more information, please visit <http://www.asee.org/conferences/index.cfm>.

The conference kicks off with a picnic on Sunday evening. This is an excellent time to see old friends and make new ones in the mechanics education community and in ASEE in general. Please look for the Mechanics Division banner at the picnic.

Benson Tongue, our program chair, has developed an outstanding program for us. I hope you can attend all or most of the sessions. This year's award banquet promises to be something truly unique. The banquet will be held aboard the riverboat Gateway Clipper as we cruise on the Monongahela River. During the banquet, we will honor several of our colleagues for their contributions to mechanics education. Please make plans to attend...it will be a good time and a memorable evening.

I encourage you to attend both the Mechanics Division Executive Committee meeting early Monday morning and the Mechanics Division Business meeting at noontime on Wednesday. These are not ticketed sessions so please feel free to bring your breakfast or your lunch to the meetings. For the Mechanics Division to remain vital and relevant it is important to merge the experience and service of our longtime members with the innovations and energy of new members. Your input and ideas will keep this division vibrant, and we encourage you to come join us and get involved.

I'd like to thank the officers and committees for all of their work in making the Mechanics Division run so smoothly this year. Thanks to Joe Rencis of University of Arkansas for creating and maintaining the division's web site, <http://comp.uark.edu/~jjrencis/aseemechanics/index.htm>.

See you in Pittsburgh!

**Tim Philpot**

Mechanics Division Chair, 2007-2008

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## **Comments on the 2008 Mechanics Division Program**

This year's conference will present 22 mechanics papers, distributed in a number of sessions. I would like to offer my heartfelt thanks to all the division members who volunteered their time and energy as reviewers, both of the abstracts and the final papers. Their comments and thoughtful criticisms helped to ensure that we'll have an excellent set of sessions (and proceedings papers) to look forward to. Thanks as well to those who agreed to serve as moderators. Moderating is key to making sure the actual presentations run smoothly and I'm sure that our moderators will provide the appropriate level of tough love to ensure everyone gets the time "on stage" that they've been promised. And finally, a big thank you to all of those mechanics members who helped me bring everything together this year – you know who you are and you have my gratitude.

The Mechanics Division is sponsoring six technical sessions and co-sponsoring (with mechanical engineering) two sessions, to the tune of three on Monday, three on Tuesday, and two on Wednesday. These sessions range from specific looks at particular courses to overviews of education nationally, from hand-on projects to distributed web-based education. There's going to be a lot to see. All the presentations will have associated papers in the proceedings, so come to the talks to hear the essence of the work and peruse the papers for the details.

In addition to the technical sessions, mark your calendars as well for the Mechanics Division executive committee meeting at 7 a.m. on Monday, the annual Awards Banquet on Tuesday evening (a unique cruise ship dinner, with boarding at 6:30 and cast-off at 7:00), and the Mechanics Division business meeting on Wednesday at 12:30 pm. These meetings are open to anyone interested in the Mechanics Division activities. No meals will be provided at the executive and business meetings so attendees are encouraged to bring breakfast or lunch purchased from a local vendor with them to the meeting.

If you have any questions or comments about the program, please don't hesitate to contact me.

Best,  
Benson Tongue ([bhtongue@me.berkeley.edu](mailto:bhtongue@me.berkeley.edu))  
2007-2008 Mechanics Division Program Chair

## **ASEE Annual Conference, Pittsburgh, 2008 – Mechanics Division Events**

### **Mechanics Division Awards Banquet – Tuesday, June 24**

WHAT? Enjoy fine dining while cruising the Monongahela aboard a luxurious riverboat? Is this a vacation or a conference? Well, for this one evening, it's both. Come join the Mechanics Division for our Annual Awards Banquet aboard the Gateway Clipper. Great companions, wonderful food, fascinating conversation, and an exhilarating two hour cruise all rolled into one. It's truly an event not to be missed. You'll want to sign up early though, because as the old saying goes - seats are limited. Boarding begins at 6:30 from the Convention Center dock with cast off at 7:00. This is a ticketed event. \$75 pre-reg, \$85 on-site.

### ***Mechanics Division Award Recipients—2008***

The Mechanics Division is pleased to announce the following winners of its 2008 awards. Join us in congratulating these colleagues. Plan to attend the annual Awards Banquet on Tuesday evening, June 24.

#### **Archie Higdon Distinguished Mechanics Educator Award**

Paul Steif, Carnegie Mellon University

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

Andrea Surovek, South Dakota School of Mines and Technology

Greg Odegaard, Michigan Technological University

Kevin Turner, University of Wisconsin – Madison

#### **Meriam Service Award**

Renata Engel, Pennsylvania State University

#### **The Mechanics Division Best Paper Award (2008 Annual Conference)**

*Design and Application of a Beam Testing System for Experimental Learning in Mechanics of Materials*

Rani Sullivan, Mississippi State University

Masoud Rais-Rohani, Mississippi State University

#### **The Mechanics Division Best Presentation Award (2007 Annual Conference)**

*A Web-Based Electronic Book (Ebook) for Solid Mechanics*

Kurt Gramoll,

# ASEE Annual Conference, Pittsburgh, 2008 – Mechanics Division Events

**Monday, June 23, 2008**

## **1168: Mechanics Division Executive Committee Meeting**

7:00-8:15 a.m.

**Moderator(s)** Tim Philpot

**Division(s)** Mechanics Division

This is the annual executive committee meeting for the Mechanics Division to discuss issues and set the agenda for the annual division business meeting on Wednesday.

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## **1468: Anything New in Dynamics?**

12:30-2:00

**Moderator(s)** Benson Tongue

**Divisions(s)** Mechanics Division

This session looks at ways to improve dynamics classroom instruction through the use of design projects, innovative teaching methods, and so forth.

*AC 2008-87: TEACHING MULTIBODY DYNAMICS IN AN UNDERGRADUATE CURRICULUM – AN INTUITIVE AND EXPLICIT FORMALISM BASED ON PARASITIC ELEMENTS*

Geoff Rideout, Memorial University of Newfoundland

*AC 2008-393: RIGID BODY DYNAMICS IN THE MECHANICAL ENGINEERING LABORATORY*

Thomas Nordenholz, California Maritime Academy

*AC 2008-1437: A NEW SPIN ON TEACHING 3D KINEMATICS AND GYROSCOPIC MOTION*

Brian Self, California Polytechnic State University

Charles Birdsong, California Polytechnic State University

Eileen Rossman, California Polytechnic State University

*AC 2008-2227: INVESTIGATING IMPULSE LOADING USING MODEL ROCKETRY*

Byron Newberry, Oklahoma Christian University of Science and Arts

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## **1568: Mechanics Education Programs and Projects**

2:15-4:00

**Moderator(s)** Rungun Nathan

**Division(s)** Mechanics Division

This session features innovative and non-traditional programs and projects associated with statics, dynamics, and mechanics of materials courses.

*AC 2008-565: STATICS AND DYNAMICS PROJECTS EMPHASIZING INTRODUCTORY DESIGN AND MANUFACTURING*

Michael Hennessey, University of St. Thomas

*AC 2008-1139: SURVEY OF ENGINEERING MECHANICS IN CIVIL ENGINEERING CURRICULA*

Bridget Wadzuk, Villanova University

David Dinehart, Villanova University

Edward Glynn, Villanova University

Shawn Gross, Villanova University

Francis Hampton, Villanova University

*AC 2008-1350: DESIGN PROJECT DESIGN FOR AN ELEMENTARY STRENGTH OF MATERIALS COURSE*

Cliff Lissenden, Pennsylvania State University

Nicholas Salamon, Pennsylvania State University

Andrew Miller, Pennsylvania State University

*AC 2008-2105: LEARNING STATICS – A FOUNDATIONAL APPROACH*

Sridhar Condoor, Parks College of Saint Louis

Sanjay Jayaram, Saint Louis University, Parks College of Eng.

Lawrence Boyer, St. Louis University

*AC 2008-2537: ASSESSING COGNITIVE REASONING AND LEARNING IN MECHANICS*

Chris Papadopoulos, University of Wisconsin -Milwaukee

**Tuesday, June 24, 2008**

**2268: Mechanics and the Internet**

8:30-10:15 a.m.

**Moderator(s)** Phil Cornwell

**Divisions(s)** Mechanics

*AC 2008-249: INTEL: INTERACTIVE TOOLKIT FOR ENGINEERING EDUCATION*

Calvin Ashmore, Georgia Institute of Technology

Daniel Upton, Georgia Institute of Technology

Bo Yeon Lee, Georgia Institute of Technology

Geoff Thomas, Georgia Institute of Technology

Sneha Harrell, UC Berkeley

Christine Valle, Georgia Institute of Technology

Janet Murray, Georgia Institute of Technology

Wendy Newstetter, Georgia Institute of Technology

Laurence Jacobs, Georgia Institute of Technology

Sue Rosser, Georgia Institute of Technology

*AC 2008-741: LESSON STUDY FOR A DISTANCE EDUCATION STATICS COURSE*

Mark Holdhusen, University of Wisconsin-Marathon County

Christa James-Byrnes, University of Wisconsin, Barboo/Sauk County

Luis Rodriguez, University of Wisconsin - Waukesha

*AC 2008-2057: STUDENT ACADEMIC DEVELOPMENT THROUGH PRESCRIBED UNDERGRADUATE PROJECTS*

Shahnam Navaee, Georgia Southern University

*AC 2008-2116: ONLINE INTERACTIVE MEMS EXPERIMENTS AND WEB-BASED CURRICULUM*

Kurt Gramoll, University of Oklahoma

Siamak Faridani, University of Oklahoma

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**2266: Improving Mechanics and Structural Modeling Courses**

8:30-10:15 a.m.

**Moderator(s)**

**Divisions(s)** Mechanical Engineering, Mechanics

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**2468: Useful Teaching Techniques in Mechanics**

12:30-2:00

**Moderator(s)** Benson Tongue

**Divisions(s)** Mechanics

This session features something a little bit different. The topic is "useful teaching techniques" and Prof. Tongue will lead off with a paper on just that. Following this, a bevy of exceptional teachers will present some of the "toys and demos" that energize their classes. The intent is to be interactive and audience participation is encouraged. Bring your own devices and help demonstrate how mechanics can be made fun and compelling.

*AC 2008-424: ENHANCING LECTURE PEDAGOGY THROUGH TARGETED BREAKS*

Benson Tongue, University of California-Berkeley

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**2768: Mechanics Division Awards Banquet**

6:30-8:00

**Moderator(s)** Tim Philpot

**Divisions(s)** Mechanics

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**3168: Enhancing Mechanics Instruction**

7:00-8:15 a.m.

**Moderator(s)** Benson Tongue

**Divisions(s)** Mechanics

This session focuses on efforts to improve instruction in statics, dynamics, and mechanics of materials courses.

AC 2008-65: *VIBRATIONS LABS TO HELP ACHIEVE A RESONANCE IN LEARNING*

Phillip Cornwell, Rose-Hulman Institute of Technology

AC 2008-1193: *A MULTI-FUNCTIONAL, SMART, FLEXIBLE, VERTICAL, CANTILEVERED BEAM EXPERIMENT TO IMPROVE UNDERGRADUATE EDUCATION*

Gangbing Song, University of Houston

Mithun Singla, University of Houston

Christy Chang, University of Houston

Richard Bannerot, University of Houston

AC 2008-2283: *A STRUCTURED APPROACH TO PROBLEM SOLVING IN STATICS AND DYNAMICS: ASSESSMENT AND EVOLUTION*

Francesco Costanzo, Pennsylvania State University

Gary L. Gray, Pennsylvania State University

AC 2008-2295: *A PROBLEM-CENTERED APPROACH TO DYNAMICS*

Gary L. Gray, Pennsylvania State University

Francesco Costanzo, Pennsylvania State University

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**3468: Mechanics Division Business Meeting**

12:30-2:00

**Moderator(s)** Tim Philpot

**Divisions(s)** Mechanics

This is the annual business meeting for the Mechanics Division. All members are cordially invited to attend this event. Non-members interested in participating in Mechanics Division activities are welcome to attend in a non-voting capacity. Feel free to grab lunch at a nearby vendor and bring it to the meeting.

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**3668: Anything New in the Mechanics of Materials?**

4:30-6:00

**Moderator(s)** Ing-Chang Jong

**Divisions(s)** Mechanics

This session focuses on educational innovations in the mechanics of materials courses.

AC 2008-66: *UNDERSTANDING THE EFFECT OF RESIDUAL STRESSES ON SURFACE INTEGRITY AND HOW TO MEASURE THEM BY A NON-DESTRUCTIVE METHOD*

Daniel Magda, Weber State University

AC 2008-1633: *DESIGN AND APPLICATION OF A BEAM TESTING SYSTEM FOR EXPERIENTIAL LEARNING IN MECHANICS OF MATERIALS*

Rani Sullivan, Mississippi State University

Masoud Rais-Rohani, Mississippi State University

AC 2008-2056: *HUMAN BONE SOLID MECHANICS CHALLENGE: FUNCTIONALLY GRADED MATERIAL STRUCTURE WITH COMPLEX GEOMETRY AND LOADING*

Arturo Fuentes, University of Texas-Pan American

Stephen Crown, University of Texas-Pan American

Bob Freeman, University of Texas-Pan American

AC 2008-2796: *DEFLECTION OF A BEAM IN NEUTRAL EQUILIBRIUM À LA CONJUGATE BEAM METHOD: USE OF SUPPORT, NOT BOUNDARY, CONDITIONS*

Ing-Chang Jong, University of Arkansas

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