



# Experimentally Speaking...

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## MESSAGE FROM THE PRESIDENT



Nancy Sottos, SEM President, 2014-2015

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### INCOMING PRESIDENT'S GOALS AND APPOINTMENTS

I am excited to begin my term as the next president of the Society of Experimental Mechanics. I am honored to serve the dedicated group of researchers, faculty, and students that make up the society and share my passion for experimental mechanics.

As I begin my term, I inherit a society in excellent health. I would like to recognize the current SEM President, Prof. Emmanuel Gdoutos and thank him for his excellent service over the past year. I also would like to recognize the extraordinary service of Jon Rogers, who has served as SEM Treasurer for the past 12 years. Jon guided the society through some rocky financial times and his dedicated efforts helped lead us to the current financial stability we now enjoy as a society. A special plaque was created to recognize Jon and I hope you will join me in thanking him for his hard work and service to SEM. Although there are big shoes to fill, SEM is very lucky to have Kristin Zimmerman take over as Treasurer this year. I also would like to acknowledge the efforts of all society members who took time out of their busy schedules to serve on committees over the past year – it is your sustaining contributions that make this society so successful.

It is customary for the incoming SEM president to outline their goals and agenda for the coming year. I thought it would be fun to intermix my goals and vision for the next year as a “Top 10” of the most exciting things for SEM members in 2014-2015. The first seven items I’ve identified represent examples of positive events or initiatives that are currently underway:

10. An outstanding 2014 Murray lecture presented by Prof. G. Ravichandran and an outstanding JSA Young Investigator lecture by Prof. Samantha Daly. Together these lectures recognize excellence of the most senior and accomplished members of SEM, as well as recognize the most promising next generation of our younger members. I encourage all SEM members to be active in putting forward nominations for these prestigious talks.

9. Scientific artwork featured on the SEM conference program. As you may have already noticed, the program for the 2014 feature images supplied by Prof. Ravichandran from his Murray Lecture. I hope to continue this trend for future meetings.

*Continued*

8. The SEM Annual Meeting has gone mobile. A new mobile App, which first debuted at IMAC, is available to download for following the conference program and planning your meeting schedule. Special thanks to Nuno for taking the lead on this development. It is important that we deliver conference content and correspondence using the most relevant and up-to-date technology.

7. A new publisher for Experimental Techniques. A new contract to publish ET has been negotiated with Springer. ET is an important resource for the SEM community and we hope this new publishing agreement will continue to grow and strengthen ET.

6. A new Editor for Experimental Mechanics. Hareesh Tippur's term as Technical Editor will finish at the end 2015. Hareesh has done an excellent job leading EM and it will be critical over the next year to identify new potential candidates to fill his shoes and seamlessly transition the journal.

5. A new journal. The society will launch a new journal on dynamic properties of materials. Eric Brown has been instrumental in organizing this effort and will serve as the first editor. New initiatives such as this journal are important for expanding the society and meeting the scholarships needs of current members.

4. New SEM awards. Thanks to the efforts and suggestions of the membership, SEM will likely initiate two new awards this year. These initiatives are important for recognizing the outstanding achievements of our membership.

The final three items are essentially my goals for the coming year.

3. Expand of our base membership. Individual memberships have been gradually declining over the past five years. Although graduate student memberships are now at a high, the society needs a plan to expand our base membership smartly. I plan to work with the board and the Membership Committee chaired by Peter Ifju to reenergize recruitment of new members and improve retention of the current membership. I am an active member now because many years ago Arun Shukla reached out to me as brand new assistant professor and encouraged me to become involved with SEM. We have a lot to offer as a society and I challenge all of our members to reach out to potential new recruits.

2. Increase involvement of young researchers. Participation of graduate students and young researchers in SEM activities is critical for the future of the society. Many of my predecessors as President have had this same goal. The recent efforts to hold regional student conferences, the panels on junior careers, and new awards for young researchers are examples of successful programs that will continue to be supported. We should encourage participation of young researchers and new members in the Technical Divisions and open up new avenues to participate in the conference such as a well-organized poster session.

1. Energize the membership. As a society, we must ensure that we continue to meet the technical needs of our increasingly diverse, international membership. SEM conferences need to deliver a well-balanced portfolio of cutting edge research, applications, education and networking opportunities for the experimental mechanics community. Technical Divisions need to be vibrant and proactive to produce excellent sessions and tracks. The journals associated with SEM need to strive to publish the best new papers in the field. The society needs to remain flexible and support new initiatives from our members as experimental mechanics spans new disciplines. As President, I am happy to set an ambitious agenda on this front, but the bottom line is that we need to engage both seasoned and new members to be active and involved.

I hope that my Top 10 list reflects the most exciting activities and directions for the Society. I look forward to working with the Executive Board, the SEM staff and the membership towards achieving these goals.

My appointments for the coming year are:

- Tom Proulx, as Secretary
- Kristin Zimmerman, as Treasurer
- Jon Rogers, as Assistant Treasurer
- Emmanuel Gdoutos, Immediate Past President as Chair Administrative Council
- Peter Avitabile, as Chair of the National Meetings Council
- Satoru Yoneyama, as Vice Chair of the National Meetings Council
- Robert Goldstein, as Vice Chair of the Research Committee
- F. Necati Catbas, as Vice Chair Technical Activities Council

In closing, I would like to thank the SEM staff, whose dedicated efforts keep the society and all of our sponsored activities running smoothly. We could not do it without them!

I encourage you to contact me with ideas and suggestions about how the society can better serve its members. I look forward to an exciting and productive year!

Nancy Sottos  
SEM President

# INTEL INTERNATIONAL SCIENCE AND ENGINEERING FAIR 2014

The Intel International Science and Engineering Fair, a program of Society for Science & the Public, is the world's largest pre-college science competition, and included 1,700 high school students from more than 70 countries, regions and territories. Finalists showcased their independent research as they competed for more than \$5 million in awards.

Students are able to compete as a finalist in the Intel International Science and Engineering Fair after winning a top prize from one of 435 affiliate fairs. In addition to presenting their research

on a global stage, Intel International Science and Engineering Fair finalists were judged by and interacted with doctoral level scientists as they competed for prizes. Each year, more than 400 finalists receive awards and prizes for their groundbreaking research.

Thanks to the financial support of SEMEF, SEM has sponsored an award to recognize excellent projects in the experimental study of materials and mechanical structures. Congratulations to our 2014 award recipients.



From left-to-right: *Conor Richard Foy, Michelle Dyane Marrero-Garcia, Megan Boyer and Gary Foss*

## FIRST AWARD \$2500

Conor Richard Foy, 17, Colaiste Chiarain, Limerick, Ireland

EE090

"To Design and Manufacture a Device to Maximize the Performance of Rowers" My project was to develop a system to maximise a rowing crew's performance. The crew's performance critically depends on the synchronisation of the rowers and effectiveness of the force exerted by each rower - a skill that takes years to develop. My system accelerates the development of this skill, by giving the rowers a real time visual indication of their timing with respect to the lead rower and a measure of the force exerted.

## SECOND AWARD OF \$1500

Michelle Dyane Marrero-Garcia, 15, Eugenio Maria de Hostos High School, Mayaguez, Puerto Rico

EN034

"Study of Properties of Aluminum Wires Treated with Nanoparticles of MoB<sub>2</sub>" The need for a material of lower cost, for electronic packaging as the main use, was the main motivation for the investigation. This objective brought to the question "Is it possible to make a composite at a lower cost with the same or better properties than aluminum-diamond?"

## THIRD AWARD OF \$1,000

Megan Boyer, 17, Manchester High School, Manchester, Connecticut

EN021

"The Effects of Barefoot and Shod Running on Risk of Injury in High School, Female, Recreational Runners"

While previous studies have investigated the incidence of injuries among high school cross country runners, there has yet to be a study conducted to compare barefoot and shod running in this population. My experiment investigates the influence of these two conditions on biomechanical risk factors that have previously been associated with injuries in female high school runners.



# 2014 SEM ANNUAL CONFERENCE AND EXPOSITION ON EXPERIMENTAL AND APPLIED MECHANICS

JUNE 2–5, 2014 AT THE HYATT REGENCY GREENVILLE, GREENVILLE, SC USA

HIGHLIGHTS AND AWARDS OF 2014 SEM ANNUAL IN GREENVILLE, SOUTH CAROLINA



*Emmanuel Gdouts—SEM President with Samantha Daly—JSA Young Investigator Lecturer and José L. F. Freire—JSA Editor*



*Emmanuel Gdouts—SEM President and Guruswami (Ravi) Ravichandran—William M. Murray Lecturer*



*Emmanuel Gdouts and Robert Sanford—Gold Membership Certificate recipient*



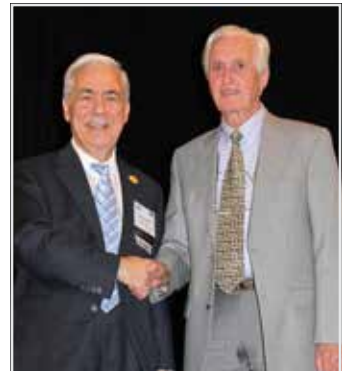
*Emmanuel Gdouts and Weinong (Wayne) Chen—SEM Fellow*



*Emmanuel Gdouts and Wolfgang Osten—SEM Fellow*



*Emmanuel Gdouts and Archie A.T. Andonian—SEM Fellow*



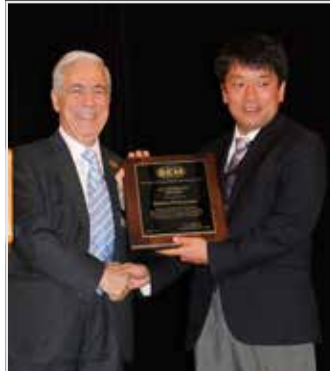
*Emmanuel Gdouts and Wolfgang Knauß—Gold Membership Certificate recipient*



*SEM Past Presidents— José L. F. Freire, Wei-Chung Wang, Mark Tuttle, Carlos Ventura, Arun Shukla, Randy Allemang, Gary L. Cloud, Michael Sutton, James Dally, Michael Fourney, William L. Fourney, Jonathan Rogers and Peter Ifju*



*Gary Cloud—Gold Membership Certificate recipient and Matthew Hudspeth—Cloud Scholarship recipient*



*Emmanuel Gdoutos and Satoru Yoneyama—A.J. Durelli award recipient*



*Emmanuel Gdoutos and William L. Fourney—M.M. Frocht award recipient*



*Emmanuel Gdoutos and François Hild—B.J. Lazan award recipient*



*Emmanuel Gdoutos and Bartłomiej Winiarski—R.E. Peterson award recipient*



*Emmanuel Gdoutos and Kristin B. Zimmerman—F.G. Tatnall award recipient*



*Emmanuel Gdoutos and Isaac M. Daniel—C.E. Taylor award recipient*



*Emmanuel Gdoutos and Robert E. Rowlands—F. Zandman award recipient*



*International Student Paper Competition participants*



*J. Ronald Winter—Gold Membership Certificate recipient and his wife Barbara Faye*



**Left-to-right:** *Elizabeth Jones—3<sup>rd</sup> place winner, Cody Kunka—2<sup>nd</sup> place winner and Jason Geathers— 1<sup>st</sup> place winner*



# GRADUATE STUDENT SYMPOSIA

## UNIVERSITY OF FLORIDA HOSTS THE SOUTHEAST GRADUATE STUDENT SYMPOSIUM ON EXPERIMENTAL MECHANICS

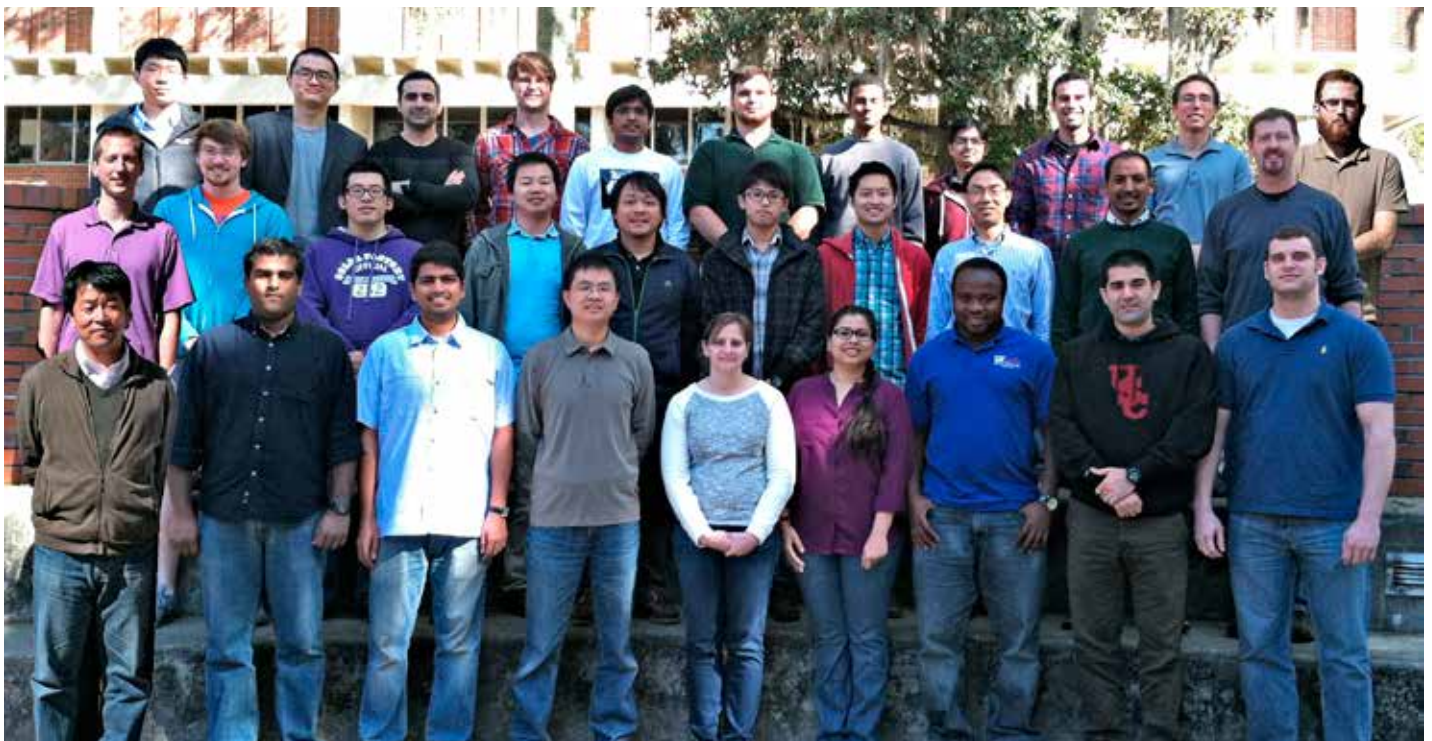
On Saturday, March 8 and Sunday, March 9, during the University of Florida (UF) spring break, the Mechanical and Aerospace Engineering (MAE) Department hosted the Society for Experimental Mechanics (SEM) Southeast Graduate Student Symposium on Experimental Mechanics.

This is an annual event that allows students to present their research in a relaxed setting and annually rotates between schools in the Southeast. The symposium has a more than thirty year history and owes its origins to Professor Charles E Taylor (UF Professor Emeritus).

Students from UF, the University of South Carolina, Auburn University and North Carolina State University gathered in the New Engineering Building to presented work on a variety of topics including; characterization of brain tissue subjected to dynamic shock loading, nanoindentation of ceramics, magnetic assisted surface finishing, fracture mechanics, shape memory polymers, characterization of silver nanowires,

fabrication and characterization of flapping wings, bend-twist coupling of composite shafts, droplet formation, piezoelectric characterization, digital gradient sensing, deformation of polymer foams, and testing of silicon nanowires.

Professor Peter Ifju hosted a dinner-party and bonfire at his house on Saturday night. The forum allowed for casual social and professional interaction between faculty and students from southeast universities. In all, there were 25 presentations and more than 40 participants. The event was sponsored by SEM and the UF MAE department.



## UNIVERSITY OF MICHIGAN HOSTS THE MIDWEST GRADUATE STUDENT SYMPOSIUM ON EXPERIMENTAL MECHANICS

On Saturday, May 24 and Sunday, May 25, the Mechanical Engineering (ME) Department and the College of Engineering (CoE) hosted the Society for Experimental Mechanics (SEM) Midwest Graduate Student Symposium on Experimental Mechanics. This event allows students to present their research in a relaxed setting and rotates between schools in the Midwest.

The symposium has a more than thirty year history and owes its origins to Professor Charles E Taylor. Students from Carnegie Mellon, Marquette, Michigan State, Northwestern, Ohio State, Penn State, Purdue, the University of Pittsburgh, Wisconsin-Madison, and the University of Michigan gathered to present work on a variety of topics including; the impact behavior of structural batteries, dynamic fracture phenomena and characterization, viscoelastic properties of hydrogels, vibration, adhesive fracture of biomaterial specimens, shape memory alloys, characterization and modeling of anterior cruciate ligament biomechanics, microscale material removal,

aeroelastic performance evaluation of Aileron, and strain evolution in MAX phases.

Professor Sam Daly and her research group hosted a dinner-party at a local lake on Saturday night. The forum allowed for casual social and professional interaction between faculty and students from Midwest universities. In all, there were 31 presentations and more than 40 participants. The event was sponsored by SEM, the U-M ME department, and the U-M College of Engineering.





Experimentally Speaking...

# THANK YOU TO OUR SPONSORS!

2014 SEM ANNUAL CONFERENCE AND EXPOSITION



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