



# Materials Division

## 2015 Fall Newsletter

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## MESSAGE FROM THE CHAIR



*Junlan Wang, Division Chair*

It has been a great honor for me to serve on the American Society of Mechanical Engineers (ASME) Materials Division (MD) Executive Committee for the past five years (2010-2015) and as the Division Chair for the past year. I am grateful to follow the footsteps of a group of dedicated past chairs including **A.M. Rajendran** of University of Mississippi, **Mohammed Zikry** of North Carolina State University, **Vikas Prakash** of Case Western Reserve University, **Julie Chen** of University of Massachusetts, Lowell, and **Karl Jacob** of Georgia Tech. It has been a distinct pleasure to work with my current committee members including **George Z. Voyiadjis** (vice-Chair) of Louisiana State University, **Xi Chen** (Honors and Awards Chair) of Columbia University, **Valeria La Saponara** (Program Chair) of University of California - Davis, and **Yong Zhu** (Secretary and Treasurer) of North Carolina State University. Thank you all for the support, companion and friendship.

The Materials Division has gone through a very active and successful year in 2014-2015 with the following highlights:

**McMat 2015:** Following a fine tradition between the ASME Applied Mechanics Division and Materials Division, the two divisions hold joint Mechanics and Materials (McMat) summer meetings every four years with the leadership alternating between AMD and MD. This year, the Materials Division took the leadership role to organize the McMat 2015 which took place from June 29-July 1, 2015 in Seattle, WA. Thanks to the diligent effort of all the symposium organizers and the local organizing committee members, the conference was a great success with over 440 presentations in 25 symposia, 79 technical sessions including three plenary speakers - **Satya Atluri** of University of California, Irvine, **Nancy Sottos** of University of Illinois at Urbana-Champaign and **Zhigang Suo** of Harvard University at the morning plenary sessions and one distinguished dinner speaker - **Mark D. Jenks** of the Boeing Company at the University of Washington (UW) hosted banquet. Special thanks to the Boeing Company, the University of Washington College of Engineering (in particular, the Department of Mechanical Engineering, and the William E. Boeing Department of Aeronautics and Astronautics) for the financial sponsorship of the UW Banquet, and the National Science Foundation for providing travel support to an elite group of graduate students, postdocs and community college instructors. The conference website can be found at: <http://www.asmeconferences.org/mcmat2015>.

**IMECE:** The Materials Division continues to play active roles in the annual ASME International Mechanical Engineering Congress and Exposition (IMECE), largely owing to the hard work of all the Technical Committees and the Program Chairs. At the upcoming IMECE 2015 in Houston, we are sponsoring/co-sponsoring 33 symposia with a total of 70 technical sessions. While the MD track “Materials: Genetics to Structures” (thanks to the track chairs **Ram Mohan** of North Carolina A&T State University and **Valeria La Saponara** of UC Davis) serves as the hub for many of the materials centric symposia, a large number of the MD symposia are co-sponsored with other divisions such as Applied Mechanics, Energy, and listed under several different tracks such as Track 1, 2, 3, 7, 12 and 13.

**Journals:** The Materials Division is the sole sponsor of the ASME Journal of Engineering Materials and Technology (JEMT). Under the leadership of the current Editor-in-Chief **Mohammed Zikry** of North Carolina State University and a group of dedicated Associate Editors, the journal continues to do very well. In addition, together with ASME Bioengineering Division, ASME Heat Transfer Division, and the ASME Fluids Engineering Division, the Materials Division serves on the Advisory Board to manage the relatively young multidisciplinary journal (launched in Nov. 2010) - ASME Journal on Nanotechnology in Engineering and Medicine (JNEM). Under the excellent leadership of the current journal Editor-in-Chief **Boris Khusid** of New Jersey Institute of Technology, JNEM has been flourishing over the past five years. Members are encouraged to submit your high quality works to both journals.

The JEMT website can be found at:

<http://materialstechnology.asmedigitalcollection.asme.org/journal.aspx>

The JNEM website can be found at:

<http://nanoengineeringmedical.asmedigitalcollection.asme.org/journal.aspx>

**Awards:** The Materials Division is proud to be the home of several distinguished ASME awards both at the society level including the Sia Nemat-Nasser Early Career Award and the Nadai Medal, and at the division level including the ORR “JEMT” Best Paper Award and ORR Early Career Award. Each year, a rigorous nomination and evaluation process is taken to select the most deserving candidate for each award. The following outstanding individuals received the awards and recognitions at IMECE 2014 in Montreal, Canada:

- Prof. **L. Cate Brinson** of Northwestern University received the Nadai Medal.
- Prof. **Kevin T. Turner** of the University of Pennsylvania received the Sia Nemat-Nasser Early Career Award.
- Prof. **Jaafar El-Awady** of Johns Hopkins University received the Orr Early Career Award.
- Prof. **Hareesh V. Tippur** and graduate student **Robert W. Bedsole** of Auburn University received the ORR “JEMT” Best Paper Award.

The following outstanding individuals will be recognized at IMECE 2015 in Houston, TX:

- Prof. **Huajian Gao** of Brown University will receive the Nadai Medal.
- Prof. **Yong Zhu** of North Carolina State University will receive the Sia Nemat-Nasser Early Career Award.
- Prof. **Michael D. Sangid** of Purdue University will receive the Orr Early Career Award.
- Prof. **Jaehyung Ju** and graduate students **Jaehong Lee, Kwangwon Kim** of University of North Texas and Prof. **Doo-Man Kim** of Korea Aerospace University will receive the ORR “JEMT” Best Paper award.

The Nadai, Sia Nemat-Nasser and Orr award lectures and the Materials Division receptions are scheduled for Wednesday, Nov. 18 at the IMECE in Houston which everyone is welcome to attend.

**Technical Committees:** The Materials Division has eight Technical Committees who have been essential in organizing the many symposia at the annual IMECE and McMat. The committees are encouraged to remain active and continue to grow the scope and quality of our technical activities and engage new members.

Many individuals worked hard during my term as the Division Chair who deserve a special mention. The Executive Committee Secretary **Yong Zhu** did a great job putting together this newsletter. **Jacinta McComie** from the ASME headquarters has been providing support to Materials Division for many years, serving as the interface between the Executive Committee and ASME headquarters. **Stacy Cooper** of ASME has been a big help on taking care of the technical sessions at IMECE. While organizing the McMat 2015 conference, I had great pleasure working with **Mary Jakubowski** from ASME whose rich experience in technical meeting planning and prompt response to my non-stopping requests made the whole process much smooth and enjoyable.

Finally, I would like to extend my warm welcome to the incoming Executive Committee member **Markus Buehler** of Massachusetts Institute of Technology and Member-at-Large **Toshio Nakamura** of the State University of New York – Stony Brook. Markus and Toshio’s excellent qualifications will make them great additions to the executive committee. I will leave my post as the Division Chair after IMECE 2015 with much contentment and confidence that the Materials Division will continue to prosper and grow under the leadership and dedication of the future Executive Committee and Technical Committees.

***Junlan Wang, 2014-2015***  
Chair, ASME Materials Division

## **Materials Division Award Lectures/Reception at IMECE 2015 (Wednesday, November 18, 2015)**

**Orr Early Career Award** – 2:30-3:00pm, Hilton Ballroom of the Americas B

**Sia Nemat-Nasser Early Career Award** – 3:00-3:30 pm, same room

**Nadai Medal** – 3:30-4:00 pm, same room

**Materials Division Reception** – 4:00-5:30pm, Hilton Ballroom of the Americas C

## **MD Technical Committee and Executive Committee Meetings**

### **MD Executive Committee Meeting**

11/18/2015, 10:00 AM - 12:00 PM, Hilton337AB

### **AMD-MD Joint Committee on Constitutive Equations**

11/15/2015, 3:00 PM - 5:00 PM, Hilton 334

### **MD Composites and Heterogeneous Materials Technical Committee**

11/17/2015, 1:00 PM - 2:00 PM, Hilton 338

### **MD Electronic Materials Technical Committee**

11/16/2015, 2:00 PM - 3:00 PM, Hilton 334

### **MD Materials Processing Technical Committee**

11/17/2015, 4:00 PM - 5:00 PM, Hilton 338

### **MD Multi-functional Materials Technical Committee Meeting**

11/16/2015, 2:00 PM - 3:00, PM Hilton 340B

### **MD Nanomaterials for Energy Technical Committee**

11/17/2015, 11:00 AM - 12:00 PM, Hilton333

### **MD Nanomaterials for Medicine and Biology Technical Committee**

11/17/2015, 10:00 AM - 11:00 AM, Hilton230

### **MD Polymer and Soft Materials Technical Committee**

11/17/2015, 10:00 AM - 11:00 AM, Hilton 230



# Meeting Scenes of 2015 ASME Applied Mechanics and Materials Conference (McMat 2015)



## THE 2014 MD AND ASME SOCIETY AWARDS

### 2014 NADAI MEDAL

The 2014 Nadai Medal recipient was Prof. L. Cate Brinson of Northwestern University, Evanston, IL. The Nadai Medal is awarded in recognition of significant contributions and outstanding achievements which broaden the field of materials engineering. Dr. Brinson was recognized for significant contributions to the synthesis and characterization of polymer nanocomposites through research that has provided a fundamental understanding of the interphase and how nanoreinforcements affect polymer behavior, thus shedding light on material design for industry; and for educational contributions and service to the engineering profession.



**L. Cate Brinson** is currently the Jerome B. Cohen Professor of Engineering at Northwestern University with appointments in Mechanical Engineering and Materials Science and Engineering. After receiving her Ph.D. in 1990 from Caltech, Dr. Brinson performed postdoctoral studies in Germany at the DLR and since 1992 she has been on the faculty at Northwestern University. Current research investigations involve characterization of local polymer mechanical behavior under confinement, nanoparticle reinforced polymers, the phase transformation response of shape memory alloys, nano and microscale response of biomaterials, and materials genome informatics research, where investigations span the range of molecular interactions, micromechanics and macroscale behavior. Dr. Brinson has received a number of awards, including the Friedrich Wilhelm Bessel Prize of the Alexander von Humboldt Foundation, the ASME Tom JR Hughes Young Investigator Award, and an NSF CAREER Award; she is a Fellow of the Society of Engineering Science, of the American Society of Mechanical Engineering and of the American Academy of Mechanics; and she served as a member of the Defense Science Study Group. She has authored one book and over 140 refereed journal publications, with over 11000 citations and an h-index of 49 in Google Scholar. She has also been an Associate Editor of several journals, served two terms on the National Materials Advisory Board of the National Academies and has chaired two National Research Council studies.

### 2014 SIA NEMAT-NASSER EARLY CAREER AWARD

The 2014 Sia Nemat-Nasser Early Career Award recipient was Prof. Kevin Turner of the University of Pennsylvania, Philadelphia, Pennsylvania. The Sia Nemat-Nasser Early Career Award recognizes early career research excellence in the areas of experimental, computational, and theoretical mechanics and materials by young investigators who are within 10 years after their Ph.D. degree, with special emphasis placed on under-represented groups. Dr. Turner was recognized for outstanding research in experimental and theoretical solid mechanics, particularly for advancing the understanding of interfacial mechanics with



applications to microscale and nanoscale manufacturing, wafer bonding, layer transfer processes, failure and reliability in microsystems, and advanced lithography.



**Kevin T. Turner** is currently the Gabel Family Term Associate Professor in the Department of Mechanical Engineering and Applied Mechanics at the University of Pennsylvania. Turner's research addresses fundamental and applied problems at the intersection of the fields of surface and interface mechanics and micro- and nanosystems. Surface and interface mechanics, which encompasses fracture, contact, and adhesion mechanics, plays a crucial role in determining the behavior of many micro- and nanoscale systems and manufacturing processes. Turner's research group uses a combination of experimental measurements and modeling to improve nanomanufacturing processes as well as to develop new approaches to measure the mechanical properties of interfaces at small scales. His current work includes projects

in microtransfer printing, tip-based nanomanufacturing, nanocomposites, microfluidic devices for probing cell mechanics, and characterizing soft materials and interfaces. To read more about Turner and his research, please visit his website at <http://turner.seas.upenn.edu/>.

## 2014 ORR EARLY CAREER AWARD

The 2014 Orr Early Career Award recipient was Prof. Jaafar El-Awady of Johns Hopkins University. Any researcher within 7 years of terminal degree working in experimental, computational, or theoretical fatigue, fracture, or creep can be considered for the Materials Division Orr Early Career Award. During the award ceremony in the 2014 ASME Mechanical Engineering Congress & Exposition, Prof. El-Awady delivered an award lecture titled "Unraveling the Origins of Size-Dependent Dislocation Mediated Plasticity".



**Jaafar El-Awady** is currently an Assistant Professor of Mechanical Engineering at Johns Hopkins University (JHU) since 2010. He received his B.S. in 2001 and M.S. in 2003, with a major in Aerospace Engineering from Cairo University, Egypt, and his Ph.D. in Aerospace Engineering from the University of California, Los Angeles (UCLA) in 2008. Prior to joining JHU, Dr. El-Awady was a visiting scientist at the Wright Patterson Air Force Research Laboratory in Dayton Ohio. Dr. El-Awady's research group focuses on developing multiscale simulation techniques and microscale experiments to predict the underlying deformation, damage, and failure mechanisms in materials. Prof. El-Awady is the recipient of multiple awards including the DARPA Young Investigator Program in 2012, the ASME Orr Early Career Award in 2014, and the National

Science Foundation CAREER Award in 2015.



## 2014 ORR BEST PAPER AWARD

The 2014 Orr Best Paper Award recipients were Prof. Hareesh V. Tippur and graduate student Robert W. Bedsole of Auburn University. Their technical publication "Dynamic Fracture Characterization of Small Specimens: A Study of Loading Rate Effects on Acrylic and Acrylic Bone Cement," in ASME's Journal of Engineering Materials and Technology was selected from those published in the journal during the previous two years.



**Hareesh V. Tippur** is McWane Endowed Chair Professor and Graduate Program Chair of Mechanical Engineering at Auburn University, Alabama. He received graduate degrees from the Indian Institute of Science and State University of New York - Stony Brook. He was a post-doctoral fellow at the Caltech before joining the faculty of Mechanical Engineering Department at Auburn in 1990. He has worked extensively in the areas of fracture and failure mechanics of solids with an emphasis on high-strain rate response of novel materials. He is credited with the development of several quantitative visualization tools including hybrid laser-speckle and moiré method, coherent gradient sensing (CGS), infrared rough surface interferometry, digital image correlation for ultrahigh-speed photography and more recently the digital gradient sensing (DGS) method. His other contributions are in the areas including fracture and failure mechanics of dissimilar material interfaces, functionally graded materials, structural foams, interpenetrating phase composites, nanocomposites. His research has resulted in over 200 publications in archival journals, books and conference proceedings. He has received numerous accolades from professional societies including the Hetényi Award from the Society for Experimental Mechanics, Beer-Johnston Mechanics Educator Award from the American Society for Engineering Education, Fellow status in the American Society of Mechanical Engineers and the Society for Experimental Mechanics, Fylde Electronics Prize from the British Society for Strain Measurement, and A.S. Kobayashi Award from ICCES. Currently he serves on the editorial boards/committees of *Strain*, *Journal of Engineering Materials & Technology* and as the Editor-in-Chief of *Experimental Mechanics*.



**Robert W. Bedsole** obtained Master's and Bachelor's degrees from Auburn University and North Carolina State University in 2015 and 2009, respectively. He is currently a NASA Space Technology Research Fellow (NSTRF) at Auburn University and plans to complete his PhD in August of 2015. While there, he has developed techniques for determining dynamic fracture characteristics of small samples using ultrahigh-speed photography and digital image correlation. He has applied this methodology to various materials, including acrylic, acrylic bone cement, cortical bone, CNT-modified epoxy, and carbon fiber composites. He has co-authored multiple research articles on these topics and presented results at various conferences.

## THE 2015 MD AND ASME SOCIETY AWARDS

### 2015 NADAI MEDAL

The 2015 Nadai Medal recipient is Prof. Huajian Gao of Brown University, Providence, RI. The Nadai Medal is awarded in recognition of significant contributions and outstanding achievements which broaden the field of materials engineering. Dr. Gao is recognized for groundbreaking contributions to hierarchical nanotwinned metals, energy storage materials, metallic glasses and diffusional creep of metal thin films.



**Huajian Gao** received his B.S. degree from Xian Jiaotong University of China in 1982, and his M.S. and Ph.D. degrees in Engineering Science from Harvard University in 1984 and 1988, respectively. He served on the faculty of Stanford University between 1988 and 2002, where he was promoted to Associate Professor with tenure in 1994 and to Full Professor in 2000. He served as a Director at the Max Planck Institute for Metals Research between 2001 and 2006 before joining the Faculty of Brown University in 2006. At present, he is the Walter H. Annenberg Professor of Engineering at Brown.

Professor Gao's research is focused on the understanding of basic principles that control mechanical properties and behaviors of materials in both engineering and biological systems. He is a Member of the National Academy of Engineering and a co-editor-in-chief of the Journal of the Mechanics and Physics of Solids. He is also the recipient of numerous academic honors, from a John Simon Guggenheim Fellowship in 1995 to recent honors including the Rodney Hill Prize in Solid Mechanics from the International Union of Theoretical and Applied Mechanics in 2012, and the William Prager Medal from the Society of Engineering Science and the Nadai Medal from the American Society of Mechanical Engineers in 2015.

### 2015 SIA NEMAT-NASSER EARLY CAREER AWARD

The 2015 Sia Nemat-Nasser Early Career Award recipient is Prof. Yong Zhu of North Carolina State University, Raleigh, NC. The Sia Nemat-Nasser Early Career Award recognizes early career research excellence in the areas of experimental, computational, and theoretical mechanics and materials by young investigators who are within 10 years after their Ph.D. degree, with special emphasis placed on under-represented groups. Dr. Zhu is recognized for outstanding contributions to the mechanics of nanomaterials including interfacial mechanics with applications to nanomaterial-enabled stretchable electronics.



**Yong Zhu** received his B.S. degree in Mechanics and Mechanical Engineering from the University of Science and Technology of China in 1999, and his M.S. and Ph.D. degrees in Mechanical Engineering from Northwestern University in 2001 and 2005, respectively. He was a postdoctoral fellow at the University of Texas at Austin before he joined NCSU in 2007, where he is currently an Associate Professor in Department of Mechanical and Aerospace Engineering (affiliated in Materials Science and Engineering and Biomedical Engineering). Zhu's group conducts research at the intersection of solid mechanics and micro/nanotechnology, including nanomechanics, micro/nano-electromechanical systems, and stretchable/wearable devices. He has received several awards including Sigma Xi

Faculty Research Award in 2012, JSA Young Investigator Lecture Award from the Society of Experimental Mechanics in 2013, MAE Department Outstanding Research Award in 2015, College of Engineering Alcoa Foundation Research Achievement Award in 2015, and Sia Nemat-Nasser Early Career Award from the American Society of Mechanical Engineers in 2015.

## 2015 ORR EARLY CAREER AWARD

The 2015 Orr Early Career Award recipient is Prof. Michael D. Sangid of Purdue University, West Lafayette, IN. Any researcher within 7 years of terminal degree working in experimental, computational, or theoretical fatigue, fracture, or creep can be considered for the Orr Early Career Award. During the award ceremony in the 2015 ASME Mechanical Engineering Congress & Exposition, Prof. Sangid will deliver an award lecture titled "The Role of Microstructure in Predicting Fatigue Performance and Variability".



**Michael D. Sangid** received his B.S. (2002) and M.S. (2005) in Mechanical Engineering from the University of Illinois at Urbana-Champaign (UIUC). After his Master's degree, Dr. Sangid spent two years working in Indianapolis, IN for Rolls-Royce Corporation, specializing in material characterization, fatigue, fracture, and creep of high temperature aerospace materials before resuming his education in 2007. He received his PhD in Mechanical Engineering from UIUC in 2010 and continued as a post-doctoral associate. In the spring of 2012, Dr. Sangid started as an assistant professor at Purdue University in the School of Aeronautics and Astronautics with a courtesy appointment in Materials Engineering, where he continues his work on building computational materials models with experimental validation efforts. He is a recipient

of the TMS Young Leaders Award, the ASME Orr Award, and the AFOSR, ONR, and DARPA Young Investigator/Faculty Awards.

## 2015 ORR BEST PAPER AWARD

The 2015 Orr Best Paper Award recipients are Jaehong Lee, Kwangwon Kim and Doo-Man Kim of Korea Aerospace University, Goyang, Gyeonggi, Republic of Korea and Jaehyung Ju of University of North Texas, Denton, TX. Their technical publication "Compliant Cellular Materials with Elliptical Holes for Extremely High Positive and Negative Poisson's Ratios," in ASME's Journal of Engineering Materials and Technology was selected from those published in the journal during the previous two years.



**Jaehong Lee** is a graduate student of the School of Aerospace and Mechanical Engineering at Korea Aerospace University. He is interested in computational mechanics of nonlinear behaviors of cellular materials.



**Kwangwon Kim** is a Ph.D. student of the School of Aerospace and Mechanical Engineering at Korea Aerospace University and a visiting scholar at the University of North Texas (UNT). Mr. Kim's interests are in design and synthesis of mechanical metamaterials.



**Jaehyung Ju** (corresponding author) is an Assistant Professor of the Department of Mechanical and Energy Engineering (MEE) at the University of North Texas (UNT). His current research interests are in mechanics of metamaterials with lattice (cellular) solids. His group has explored both fundamental and applied research to realize functions of metamaterials at some structural applications – nonpneumatic tires, morphing wings, and biomedical devices.



**Doo-Man Kim** is a Professor the School of Aerospace and Mechanical Engineering at Korea Aerospace University. He is interested in thermo-mechanical analysis of aerospace structures.



## NOTE FROM THE JEMT EDITOR



*Mohammed A. Zikry  
JEMT Editor*

I am honored to be the Editor-in-Chief for the ASME Journal of Engineering Materials and Technology (JEMT). The journal has been in existence since 1973, and it is associated with the Materials Division of ASME. It has been providing top- quality research papers on contemporary issues of engineering materials and technology, for a broad spectrum of issues pertaining to experimental, computational and theoretical investigations of the mechanical behavior of materials with a mechanics of materials perspective, at physical scales ranging from the nano to the macro for materials, such as metals, polymers, ceramics, composites, biomaterials, and nanostructured materials.

The journal's major objective is to continue to publish research of the highest quality and of lasting significance in areas related to engineering materials, mechanics of materials, and materials technology. The scope is broad, since it encompasses interdisciplinary research that spans fundamental knowledge, which is related to mechanics of materials, materials science, mathematics, and applied physics, and technological applications, which are related to engineering innovations and applications. The journal will include research articles, technical notes, book reviews, and special issues related to emerging areas.

The content of the Journal will, therefore, continue to emphasize the multidisciplinary efforts needed to advance the field in areas related to materials development, experimental and computational analysis, and engineering innovation. Our aim, as an editorial board, in conjunction with the publishing team, is to establish the journal as the leading international forum for original scientific research with balanced contributions that combine theoretical, experimental, and computational investigations. Our current Associate Editors are: Said Ahzi, University of Strasbourg, Ashraf F. Bastawros, Iowa State University, Irene J. Beyerlein, Los Alamos National Laboratory, Curt A. Bronkhorst, Los Alamos National Laboratory, Peter W. Chung, University of Maryland, Huiling Duan (2018), Peking University, Harley T. Johnson University of Illinois at Urbana-Champaign, Marwan K. Khraisheh, Qatar Environment and Energy Research Institute, Erdogan Madenci, University of Arizona, Toshio Nakamura, Stony Brook University, Tetsuya Ohashi, Kitami Institute of Technology, Vadim V. Silberschmidt, Loughborough University, UK, Ghatu Subhash, University of Florida, Hareesh Tippur, Auburn University, Vikas Tomar, Purdue University. We, as the editorial team and the ASME journal staff of Colin McAteer, Erica Hodge, and Beth Darchi look forward to the challenge of pushing the journal to new heights.

## NEWS FROM THE TECHNICAL COMMITTEES

### AMD-MD Joint Committee on Constitutive Equations



*Kiran Solanki  
Committee Chair*

The AMD-MD joint Committee on Constitutive Equations meets each year at the ASME International Mechanical Engineering Congress and Exposition. At the recent committee meeting, the following colleagues were voted into the committee starting in 2013-2014: Surya Kalidindi, Georgia Tech, Kevin Long, Sandia National Lab, Jonathan Zimmerman, Sandia National Lab and Alessandro Spadoni, EPFL. If you interested in membership please contact the chair of the Committee, Prof. Kiran Solanki @asu.edu.

Our committee has organized the following symposia in the 2014 ASME-IMECE, Montreal, Canada.

- “Multi-Scale and Plasticity Models of Energy related Materials” by Hatem, and Cagin
- “High Strain-Rate Phenomena: Modeling and Experiment” by Hatem and Bammann
- “Modeling and Experiments in Nanomechanics and Nanomaterials” by Mikata and Kysar
- “Advancements in methods, tools and experimental techniques towards ICME” by Solanki & Tschopp
- “Adaptive Anisotropy in Hybrid and Non-Conventional Composites: Modeling and Applications” by Ashmawi, Lee and Elhajjar

Our committee has also organized the following symposia in the 2015 ASME-McMat, Seattle, WA.

- “Fatigue Damage and Failure Mechanics: Multiscale Experimental characterization and Modeling”, by Solanki, Jordon and Tschopp

Finally our committee has organized the following symposia in the 2015 ASME-IMECE, Houston, TX.

- “Modeling and Experiments in Nanomechanics and Nanomaterials” by Mikata and Kysar
- “Fatigue and Fracture of Joining Methods for Lightweight Materials” by Jordon and Solanki
- “Multiscale Modeling of Fatigue Damage and Failure Mechanics” by Solanki, Jordon, and Tschopp

### Composites and Heterogeneous Materials Committee

The Composites and Heterogeneous Materials Committee has organized one symposium in the ASME-IMECE, Montreal, Canada.

- “Nanostructured Materials, Coatings, Thin Films for Energy Applications” by Gobinda C. Saha and Mrinal C. Saha.

## Electronic Materials Committee



*Frank DelRio  
Committee Chair*

The Electronic Materials Committee has recently reorganized at the 2014 ASME-IMECE meeting (Montreal, Canada). Dr. Frank W. DelRio from the National Institute of Standards and Technology has been elected as the committee chair and Dr. Jianliang Xiao from University of Colorado at Boulder has been elected as the vice chair. The Committee has co-sponsored one symposium for the 2015 ASME-IMECE, Houston, TX.

- “Mechanics of Adhesion and Friction” by Yong Zhu, Frank DelRio and Jianliang Xiao.

## Materials Processing Committee



*Sridhar Santhanam  
Committee Chair*

The materials processing technical committee (MPTC) has organized several successful symposia at IMECE 2014 in Montreal, Canada. These symposia highlighted key emerging areas including: Nanoengineered, Hierarchical and Multi-Scale Materials, Innovations in Processing, Characterization and Applications of Bioengineered Materials, Processing of Flexible Electronics, and other topics in Materials Processing and Characterization. Each of these symposia had multiple sessions and were well attended and received by the materials processing community.

IMECE 2014 also featured a new track sponsored by the Materials Division. Former MPTC Chair, Prof. Ram Mohan, served as the Track Chair for this new track (Materials: Genetics to Structures). He continues as the chair for this track in IMECE 2015.

MPTC is sponsoring several symposia in the following areas at IMECE 2015 in Houston, TX.

- Innovations in Processing, Characterization, and Applications of Bioengineered Materials
- Material Processing of Flexible Electronics, Sensors, and Devices
- Nanoengineered, Hierarchical, and Multi-Scale Materials
- Online Monitoring of Materials Processing Parameters
- Materials Processing and Characterization
- Nanomanufacturing: Novel Processes, Applications, and Process-Property Relationships
- Processing, Characterization, and Applications of High Temperature Materials
- Modeling and Simulation of Material Failure

Members of the committee have been active in various other capacities at ASME. This includes serving in the awards committees for materials division and the steering committee on nanoengineering for energy systems of the ASME nanotechnology institute.

Committee meetings are held every year during IMECE. MPTC is committed to supporting symposia and forums for technical exchanges in traditional and emerging materials processing disciplines. The committee is keen to engage in a dialogue with members of the materials engineering community and other ASME divisions to foster ideas for interdisciplinary symposia and other technical activities. Please contact the current chair (Prof. Sridhar Santhanam, [sridhar.santhanam@villanova.edu](mailto:sridhar.santhanam@villanova.edu)) if you would like to participate in ongoing activities or initiate new activities in the technical areas of relevance to materials processing.

## Multifunctional Materials Committee



*Seyed Allameh  
Committee Chair*

The Multifunctional Materials Committee has organized the following symposia in the 2014 ASME-IMECE, Montreal, Canada.

- “Nanostructured Materials” by Xinnan Wang, Annie Tangpong, Yong Zhu, Xi Chen and Vikas Tomar
- “Nanomaterials and Nanostructures for Energy Applications” by Zhenhai Xia, Junhong Chen, Bingqing Wei and Ganhua Lu
- “Bioinspired Materials and Structures” by Seyed Allameh, Zhenhai Xia and Long Jiang
- “Biofuel Production” by Seyed Allameh
- “Modeling of Multifunctional Materials” by Ling Liu, Zhenhai Xia, Xin-Lin Gao, Dong Qian and Marriner H. Merrill
- “Mechanics of Adhesion and Friction” by Jianliang Xiao, Frank DelRio and Yong Zhu.

The committee has organized the following symposia at 2015 ASME-IMECE, Houston, TX.

- “Nanostructured Materials” by Xinnan Wang, Yong Zhu, Xi Chen, Vikas Tomar and Annie Tangpong
- “Nanomaterials and Nanostructures for Energy Applications” by Junhong Chen, Bingqing Wei, Zhenhai Xia, Ganhua Lu
- “Nanomaterials for 1D Energy Transfer” by Robert Vajtai, Bingqing Wei and Shadow Huang
- “Nanomaterials for Porous Media” by Robert Vajtai and Ajit Roy
- “Biomass Gasification and Biofuel Propulsion” by Seyed Allameh, Zhenhai Xia and Long Jiang
- “Biofuel Production, combustion and applications ” by Seyed Allameh and Ahmed Emara
- “Bioinspired Materials and Structures” by Albert Ratner, Seyed Allameh, and Ahmed Emara
- “Multifunctional Materials and Hybrid Materials: Modeling, Design, and Processing” by Ling Liu, Zhenhai Xia, Xin-Lin Gao, and Dong Qian
- “Mechanics of Adhesion and Friction” by Yong Zhu, Frank DelRio and Jianliang Xiao
- “Fabrication and Characterization of Multifunctional Materials” by Emil Geiger and Wanliang Shan
- “Architected Multifunctional Materials and Composites” by Rashid Abu Al Rub, Philippe Geubelle and Vikas Tomar
- “Materials for Biomedical Applications” by Vicky Nguyen, Ling Liu, and Li-Hsin Han



## Nanomaterials for Energy Committee



*Shadow Huang  
Committee Chair*

The Nanomaterials for Energy Technical Committee organized one symposium at the 2014 IMECE in Montréal, Canada.

At the upcoming IMECE 2015 in Houston, TX, the committee members are organizing 4 topics ranging 3 different tracks, with a broad range of Mechanics of Materials-related topics, and co-sponsoring from other Divisions.

The topics are:

**Track 7 Energy, 7-13 Nanomaterials for 1D Energy Transfer;**

Topic Organizer: Robert Vajtai (Rice University), Jinquan Wei (Tsinghua University), and Shadow Huang (North Carolina State University).

**Track 11 Materials: Genetics to Structures, 11-5 Nanostructured Materials for Energy Applications;**

Topic Organizer: Gobinda Saha (University of Calgary), Mrinal Saha (University of Oklahoma), Zhenhai Xia (University of North Texas), Bingging Wei (University of Delaware), Junhong Chen (Univ Of Wisconsin-Milwaukee), and Ganhua Lu (University of Alaska Anchorage).

**Track 11 Materials: Genetics to Structures, 11-9 Nanomaterials for Energy Sustainability;**

Topic Organizer: Shadow Huang (North Carolina State University), Bingging Wei (University of Delaware), Junhong Chen (University Of Wisconsin-Milwaukee), Haleh Ardebili (University of Houston), and Zhenhai Xia (University of North Texas).

**Track 12 Mechanics of Solids, Structures and Fluids, 12-37 Mechanics of Deformation and Failure of Energy Materials;**

Topic Organizer: Huck Beng Chew (University of Illinois at Urbana-Champaign), Shuman Xia (Georgia Institute of Technology), Ali Ghahremaninezhad (University of Miami), Siva Nadimpalli, (New Jersey Institute of Technology), and Shadow Huang (North Carolina State University).

The committee thanks Hsiao-Ying Shadow Huang for her service as the committee chair (2013-2015) and Haleh Ardebili as the vice-chair (who will become the chair from 2016- and 2019).

Please contact Shadow Huang ([hsuang@ncsu.edu](mailto:hsuang@ncsu.edu)) if you would like to participate in ongoing activities or initiate new activities in the technical areas of relevance to nanomaterials for energy.

We welcome new members, new ideas and symposia proposals.

## Nanomaterials for Medicine and Biology Committee



*Vicky Nguyen*  
*Committee Chair*

The Nanomaterials for Medicine and Biology Technical Committee has organized the following symposia in the 2015 ASME-IMECE, Houston, TX.

- Mechanics and Materials in Biology and Medicine (cosponsored with AMD) by K-T Wan, Vicky Nguyen and Ling Liu
- “Materials for Biomedical Applications” by Vicky Nguyen, Ling Liu, and Li-Hsin Han

## Polymer and Soft Materials Committee



*Donggang Yao*  
*Committee Chair*

The Polymer and Soft Materials TC, previously known as the Polymer TC or Polymer Materials TC, has been active in organizing symposiums at IMECE conferences.

At the 2014 IMECE, the TC sponsored two sessions under the topic of “Processing-Structure-Property Relationships of Polymers and Composites”. The first session presented papers on polymer related structure-property relationships. The second session presented papers pertaining to structure-property relationships of polymer composites. Totally 9 technical presentations were given at the conference. Both sessions were well attended by a broad international audience interested in many aspects of polymer and composite materials.

At the 2015 IMECE, the Polymer and Soft Materials TC is organizing a topic entitled “Processing, Structure & Property of Polymers, Soft Materials and Composites”, aiming to provide a platform for interdisciplinary discussion of recent developments in processing, structure and property of various types of soft materials, including but not limited to polymers, composites, gels, suspensions, complex fluids, soft glasses, and foams. This topic is organized by Dr. Donggang Yao from Georgia Institute of Technology and Dr. Ramasubramani Kuduva Raman Thanumoorthy from 3M.

The next committee meeting will be held at the 2015 IMECE meeting in Houston. If you are interested in participating in this committee’s activities or have suggestions for future programs, please contact Donggang Yao (yao@gatech.edu).

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