

ADVANCE PROGRAM
REGISTER BEFORE SEPTEMBER 2 TO SAVE!

Technical Meeting and Exhibition

MS & T17

MATERIALS SCIENCE & TECHNOLOGY

OCTOBER 8 -12, 2017 | DAVID L. LAWRENCE CONVENTION CENTER | PITTSBURGH, PENNSYLVANIA, USA

The leading forum addressing structure, properties, processing and performance across the materials community.

MATSCITECH.ORG

Organizers:



Sponsored by:



MS & T17

DAVID L. LAWRENCE CONVENTION CENTER | PITTSBURGH, PENNSYLVANIA, USA

PLENARY LECTURES

Tuesday, October 10, 2017 | 8:00 – 10:40 a.m.

AIST ADOLF MARTENS MEMORIAL STEEL LECTURE



Bruno C. De Cooman, Vice President for Research and Development, NLMK Group

Mechanical Twinning in Formable Advanced Ultra-high Strength Steel

Iron alloys and steels have impressive plasticity-enhancing potential that is often not exploited in engineering applications, as it requires a thorough understanding of the underlying mechanisms and their activation during straining. This requires a steel design approach incorporating a selection of composition, microstructure, and processing parameters based on sound theoretical principles. Most formable ferritic steels exhibit a uniform engineering elongation less than 25% and a relatively low ultimate tensile strength (<1 GPa). The formability of these steels is based on the control of their crystallographic texture, rather than the strain hardening. As a consequence, a higher strength is usually achieved at the cost of ductility. There is a way to outsmart this dichotomous conflict of properties, though: by designing fully austenitic steels or austenite-containing multi-phase steels with an enhanced strain hardening rate, both high strength and good formability can be achieved. Transformation-induced plasticity (TRIP) steel, twinning-induced plasticity (TWIP) steel and medium Mn steel belong to this category of ferrous alloys. They are characterized by a high strain hardening, a large uniform elongation and high ultimate tensile strength levels. These properties make them candidate lightweighting materials for large-scale use in the automotive industry, LNG-shipbuilding, oil-and-gas exploration and structural applications. The lecture will focus on the progress made in the understanding of deformation twinning in TWIP steel and medium Mn steel. The experimental

analysis of the properties of these steels has profited from the use of advanced techniques for microstructural characterization of materials, such as synchrotron X-ray diffraction, electron backscattering diffraction, 3D atom probe tomography, and micro-mechanical testing methods (nano-hardness, micro-pillar testing). A more sophisticated analysis of the results of standard macroscopic mechanical tests involving the strain rate and temperature dependence of the mechanical properties has also contributed to a better understanding of the mechanisms underlying the strength and plasticity of these steels.

TMS/ASM JOINT DISTINGUISHED LECTURESHIP IN MATERIALS AND SOCIETY AWARD



Alexander H. King, Director of the Critical Materials Institute, a U.S. Department of Energy (DOE) Energy Innovation Hub at Ames Laboratory

What Do We Need and How Will We Get It?

The global economy will be transformed over the next decade or so. The ranks of the world's wealthy and middle classes will swell from today's 1.9 billion to about 5.2 billion by 2030, and all of those extra consumers will demand goods and energy, among other resources, that will impact the supplies of many materials. We examine some natural, technological, social and political trends that will affect the demand and supply of materials. We discuss the options for meeting the materials needs in a rapidly changing world, and identify some emerging challenges and research opportunities. Finally, drawing on some specific success stories, we will describe approaches to doing research that may increase the likelihood of having an impact.

ACerS EDWARD ORTON JR. MEMORIAL LECTURE



Steven J. Zinkle, UTK/ORNL Governor's Chair Professor Departments of Nuclear Engineering and Materials Science and Engineering; University of Tennessee, Knoxville

What's New in Nuclear Reactors?

In the nearly 75 years since the first human-controlled sustained nuclear reaction was achieved on Dec. 2, 1942, at Stagg field in Chicago, nuclear power has grown to produce approximately 20% of the annual electricity consumed in the United States and about 13% of worldwide electricity. The vast majority of current nuclear power reactors are based on light water reactor technology originally developed in the 1950s. Numerous new nuclear reactor concepts with significant improvements in performance, safety, and economics have been proposed and/or deployed over the past 15 years. These concepts include so-called Generation III light water reactors with improved passive safety, small modular reactors with inherent passive safety that have the potential to be largely factory built and transported via rail or heavy duty trucks to the reactor site for final assembly; accident tolerant fuels that have the potential to increase coping time and reduce the consequences of a loss of coolant accident in existing light water reactors; and Generation IV reactors with improved thermodynamic efficiency, safety, and reduced waste. In nearly all of these emerging new concepts, utilization of high-performance materials are key for achieving their full potential. The potential role of SiC/SiC composites and other high-performance materials in new and retooled nuclear power reactors will be discussed.



REGISTER BEFORE SEPTEMBER 2 TO SAVE!

SHORT COURSES

Complete program and registration information are available at matscitech.org.

Train your workforce while at MS&T! In addition to MS&T programming, sponsoring societies have organized educational courses for deeper exploration of key topics in materials science.

OCT

8 SUNDAY

ADDITIVE MANUFACTURING OF METALS

Eric Bono, Engineering Solutions at Puris
8:30 a.m. – Noon | Westin, Butler – West
Sponsored by ASM

FAILURE MECHANISMS AND ANALYSIS

Ronald Parrington, Engineering Systems, Inc.
8:30 a.m. – 4:30 p.m. | Westin, Somerset – East
Sponsored by ASM

A DESIGN MINDSET FOR ADDITIVE MANUFACTURING

Howard A. Kuhn, University of Pittsburgh, America Makes
8:30 a.m. – 4:30 p.m. | Westin, Armstrong
Sponsored by ASM

ESSENTIAL MICROSTRUCTURE INTERPRETATION

Frauke Hogue, Hogue Metallography
8:30 a.m. – Noon | Westin, Butler – East
Sponsored by ASM

TESTING AND QUALIFICATION IN ADDITIVE MANUFACTURING

Dr. Prabir K. Chaudhury, Exova
8:30 a.m. – 4:30 p.m. | Westin, Westmoreland – West
Sponsored by ASM

TITANIUM SCIENCE, TECHNOLOGY, AND APPLICATION COURSE

F.H. (Sam) Froese, University of Idaho (Retired)
8:30 a.m. – 4:30 p.m. | Renaissance Pittsburgh Hotel
Sponsored by TMS

HANDS ON: INTERACTIVE MATERIALS DATA VISUALIZATION AND SELECTION TOOLS FOR RESEARCH AND TEACHING WORKSHOP

Luca Masi and Jorge Sobral, Granta Design
1 – 4:30 p.m. | Renaissance Pittsburgh Hotel
Sponsored by TMS

ADDITIVE MANUFACTURING MATERIALS AND PROCESSES WORKSHOP

David L. Bourell, University of Texas at Austin; Sudarsanam Suresh Babu, University of Tennessee-Knoxville; Jack Beuth, Carnegie Mellon University
1 – 5:30 p.m. | Renaissance Pittsburgh Hotel
Sponsored by TMS



12 THURSDAY

ADDITIVE MANUFACTURING OF HIGH-PERFORMANCE CERAMICS

Shawn Allen, Lithoz America; Johannes Homa, Lithoz GmbH; Ming Leu, Missouri University of Science and Technology, and others
9 a.m. – 6 p.m. | Omni William Penn Hotel
Sponsored by ACerS

SINTERING OF CERAMICS Day 1

Mohamed Rahaman, Missouri University of Science and Technology
9 a.m. – 4:30 p.m. | Omni William Penn Hotel
Sponsored by ACerS



13 FRIDAY 2017

SINTERING OF CERAMICS Day 2

Mohamed Rahaman, Missouri University of Science and Technology
9 a.m. – 2:30 p.m. | Omni William Penn Hotel
Sponsored by ACerS

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PROGRAM-AT-A-GLANCE

Tentative schedule, subject to change. Visit matscitech.org for the latest updates.

	Mon a.m.	Mon p.m.	Tue a.m.	Tue p.m.	Wed a.m.	Wed p.m.	Thu a.m.
ADDITIVE MANUFACTURING							
Additive Manufacturing of Composites and Complex Materials II	•	•	Plenary	•			
Additive Manufacturing of Metals: Fatigue and Fracture			Plenary		•	•	•
Additive Manufacturing of Metals: Microstructure and Material Properties	•	•	Plenary	•	•	•	
Additive Manufacturing of Metals: Post Processing	•	•	Plenary	•			
Additive Manufacturing of Metals: Powder Feedstock Characterization and Performance	•	•	Plenary				
Additive Manufacturing: In-situ Process Monitoring and Control			Plenary		•	•	
Modeling and Simulation in Additive Manufacturing: Materials Design, Property Prediction, and Process Control			Plenary		•	•	•
Non-beam-based Additive Manufacturing Approaches for Metallic Parts			Plenary		•	•	•
BIOMATERIALS							
Next Generation Biomaterials	•	•	Plenary	•	•	•	•
Surface Properties of Biomaterials	•		Plenary	•	•		
CERAMIC AND GLASS MATERIALS							
ACerS Robert B. Sosman Award Symposium: Tailoring Ceramic Microstructures: Understanding and Tuning of Materials Performance			Plenary		•	•	
Alumina at the Forefront of Technology II	•	•	Plenary	•			
Ceramic-based Optical Materials and Advanced Processing			Plenary	•	•	•	
Ceramics and Glasses Simulations and Informatics	•	•	Plenary				
Glass Composites			Plenary			•	•
Glass, Amorphous, and Optical Materials: Common Issues within Science & Technology	•	•	Plenary	•			
Innovative Processing and Synthesis of Ceramics, Glasses and Composites			Plenary		•	•	•
International Symposium on Ceramic Matrix Composites			Plenary		•	•	•
Multifunctional Oxides	•	•	Plenary	•			
Phase Transformations in Ceramics: Science and Applications			Plenary		•	•	•
ELECTRONIC AND MAGNETIC MATERIALS							
Advances in Dielectric Materials and Electronic Devices			Plenary		•	•	•
Emerging Interconnect and Pb-free Materials for Advanced Packaging Technology			Plenary		•	•	•
Emerging Multifunctional Materials for Bio, EO, RF and Radiation Sensors	•	•	Plenary	•			
ENERGY							
Hybrid Organic-Inorganic Materials for Alternative Energy	•	•	Plenary	•			
Innovations in Materials and Processes for Solar PV Applications			Plenary				
Materials for Nuclear Energy Applications	•	•	Plenary	•	•	•	•
Materials Issues in Nuclear Waste Management			Plenary		•	•	•
FUNDAMENTALS, CHARACTERIZATION, AND COMPUTATIONAL MODELING							
Actinide and Lanthanide Materials II	•	•	Plenary				
Advancements in In-situ Electron Microscopy Characterization II	•	•	Plenary	•	•		
Characterization of Fracture and Fragmentation Phenomena Across Multiple Length Scales: From Atomistic to Macroscopic Approaches	•	•	Plenary				
Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches	•	•	Plenary	•	•	•	•

	Mon a.m.	Mon p.m.	Tue a.m.	Tue p.m.	Wed a.m.	Wed p.m.	Thu a.m.
FUNDAMENTALS, CHARACTERIZATION, AND COMPUTATIONAL MODELING (cont.)							
International Symposium on Defects, Transport and Related Phenomena	•	•	Plenary		•	•	•
Materials Property Understanding through Characterization	•	•	Plenary	•	•	•	•
Multiscale Modeling of Microstructure Deformation in Material Processing			Plenary		•	•	•
Phase Stability, Diffusion Kinetics, and Their Applications (PSDK-XII)	•	•	Plenary	•	•	•	•
Phase Transformations and Microstructural Evolution in Ti and Its Alloys			Plenary		•	•	•
Recent Advances in Computer-aided Materials Design			Plenary	•	•	•	•
IRON AND STEEL (FERROUS ALLOYS)							
Advanced Steel Metallurgy: Products and Processing	•	•	Plenary	•	•	•	•
Advances in Zinc-coated Sheet Steel Processing and Properties	•		Plenary				
Gas/Metal Reactions, Diffusion and Phase Transformation during Heat Treatment of Steel			Plenary		•	•	
Shaping & Forming of Advanced High Strength Steels II	•	•	Plenary	•			
MATERIALS-ENVIRONMENT INTERACTIONS							
Advanced Coatings for Wear and Corrosion Protection				Plenary	•	•	•
Advanced Materials and Sensors for Harsh Environments				Plenary		•	•
Advanced Materials for Oil and Gas Applications - Performance and Degradation	•		Plenary				
Materials Selection and Surface Analyses for Corrosion Prevention and Detection			Plenary	•	•	•	
Surface Protection for Enhanced Materials Performance: Science, Technology, and Application	•	•	Plenary	•	•		
Thermal Protection Materials and Systems	•		Plenary				
NANOMATERIALS							
Controlled Synthesis, Processing, and Applications of Structural and Functional Nanomaterials				Plenary	•	•	•
Nanotechnology for Energy, Environment, Electronics, Healthcare and Industry Applications				Plenary	•	•	•
Responsive Functional Nanomaterials	•	•	Plenary	•	•	•	
Theory, Manufacturing and Applications of Ceramic/Metal (CerMet) Nano-laminates	•	•	Plenary				
PROCESSING AND MANUFACTURING							
Advanced Manufacturing, Processing, Characterization and Modeling of Functional Materials	•	•	Plenary				
Boron, Boron Coatings, Boron Compounds and Boron Nanomaterials: Structure, Properties, Processing, and Applications	•	•	Plenary	•	•		
Design, Processing, and Development of Structural Materials	•	•	Plenary	•	•	•	
Joining of Advanced and Specialty Materials (JASM XIX)	•	•	Plenary	•	•	•	•
Light Metals Alliance: Light Metals Technology 2017			Plenary	•	•	•	
Mechanochemical Synthesis and Reactions in Materials Science II			Plenary	•	•	•	•
Metal and Polymer Matrix Composites III			Plenary	•		•	•
Multifunctional Ceramic- and Metal-matrix Composites: Processing, Properties and Performance	•	•	Plenary				
Processing and Performance of Materials Using Microwaves, Electric and Magnetic Fields, Ultrasound, Lasers, and Mechanical Work – Rustum Roy Symposium	•	•	Plenary	•	•		
Rare Earth Metals, Compounds, and Alloys: Synthesis, Processing, Emerging Applications, Recent Advances, Future Challenges	•	•	Plenary	•	•	•	
Synthesis, Characterization, Properties and Applications of Functional Porous Materials			Plenary		•	•	•
The 9 th International Symposium on Green and Sustainable Technologies for Materials Manufacturing and Processing	•	•	Plenary	•	•	•	•
The Future of Conventional Manufacturing Processes			Plenary			•	
Titanium Powder Metallurgy			Plenary	•			
Ultra High Performance Metals, Metal Alloys, Intermetallics, and Metal Matrix Composites for Aerospace, Defense, and Automotive Applications	•	•	Plenary	•			
SPECIAL TOPICS							
Best Practices in Academic Laboratory Safety	•	•	Plenary				
Curricular Innovations and Continuous Improvement of Academic Programs (and Satisfying ABET along the Way): The Elizabeth Judson Memorial Symposium	•	•	Plenary				
Diversity in STEM and Best Practices to Improve It			Plenary	•			
Failure Analysis and Prevention	•	•	Plenary	•	•	•	•
Fifty Years of Metallography and Materials Characterization			Plenary	•	•	•	
Perspectives for Emerging Materials Professionals	•	•	Plenary				
Special Session on Emerging Technologies to Develop and Commercially Adopt Innovative Materials			Plenary	•			

LECTURES AND AWARDS

For more information on time, location, and additional fees please visit matscitech.org

OCT

9

MONDAY

9 – 10 a.m.

ACERs/EPDC ARTHUR L. FRIEDBERG CERAMIC ENGINEERING TUTORIAL AND LECTURE

- Rosario A. Gerhardt, Georgia Institute of Technology
Structure – Property – Processing Relationships in Composite Materials

2 – 4:40 p.m.

ACERs RICHARD M. FULRATH AWARD SESSION

- Akitoshi Hayashi, Osaka Prefecture University
Development of Ion-conducting Glasses for Solid-State Batteries
- Chie Kawamura, Taiyo Yuden Co. Ltd.
Synthesis of High Crystalline and Fine BaTiO₃ Powder for Thinner Ni-MLCCs Via Solid State Route
- Jon Ihlefeld, Sandia National Laboratories
New Functionality from Reconfigurable Ferroelastic Domains in Ferroelectric Films
- Hideki Tanaka, Shoei Chemical Inc.
Development of Mass Production of Ni-nanopowder for the Internal Electrode of MLCC by DC Thermal Plasma Process
- Klaus Van Benthem, University of California, Davis
Do Fields Matter? — Microstructure Evolution in Ceramic Oxides

2:30 – 4 p.m.

ALPHA SIGMA MU LECTURE

- Joseph W. Newkirk, Missouri University of Science and Technology
Creating the Materials of Tomorrow



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10 TUESDAY

8 – 10:40 a.m.

MS&T PLENARY SESSION

AIST ADOLF MARTENS MEMORIAL STEEL LECTURE

– Bruno C. De Cooman, Pohang University of Science and Technology, Korea
Mechanical Twinning in Formable Advanced Ultra-high Strength Steel

TMS/ASM JOINT DISTINGUISHED LECTURESHIP IN MATERIALS AND SOCIETY AWARD

– Alexander H. King, The Ames Laboratory
What Do We Need and How Will We Get It?

ACERS EDWARD ORTON JR. MEMORIAL LECTURE

– Steven J. Zinkle, University of Tennessee, Knoxville
What's New in Nuclear Reactors?

12:45 – 1:45 p.m.

ASM EDWARD DEMILLE CAMPBELL MEMORIAL LECTURE

– David E. Laughlin, Carnegie Mellon University
Magnetic Transformations and Phase Diagrams

1 – 2 p.m.

ACERS FRONTIERS OF SCIENCE AND SOCIETY–RUSTUM ROY LECTURE

– Qingjie Zhang, Wuhan University of Technology
Global Energy Challenges and Development of Thermoelectric Materials and Systems in China

2 – 5:00 p.m.

ACERS ALFRED R. COOPER AWARD SESSION

Cooper Distinguished Lecture

– Winners will be announced after selection by the Cooper Award Committee

2016 Alfred R. Cooper Young Scholar Award Presentation

– Winners will be announced after selection by the Cooper Award Committee

11 WEDNESDAY

1 – 2 p.m.

ACERS BASIC SCIENCE DIVISION ROBERT B. SOSMAN LECTURE

– Michael J. Hoffmann, Karlsruhe Institute of Technology (KIT)
Grain Growth in Perovskite-based Ceramics

2017

SPECIAL EVENTS

Visit matscitech.org for the latest updates.

OCT

8 SUNDAY

ACERS KERAMOS RECEPTION

5 – 7 p.m.

MS&T WOMEN IN MATERIALS SCIENCE RECEPTION

6 – 7 p.m.

9 MONDAY

PITTSBURGH COMPANION EVENT

9 – 10 a.m.

ACERs BASIC SCIENCE DIVISION CERAMOGRAPHIC EXHIBIT AND COMPETITION

(Monday) 8 a.m. – 6 p.m.

(Tuesday) 7 a.m. – 6 p.m.

(Wednesday, Thursday) 7 a.m. – Noon

ASM WOMEN IN MATERIALS ENGINEERING BREAKFAST (ticketed event)

7 – 9 a.m.

ASM LEADERSHIP AWARDS LUNCHEON

11:30 a.m. – 1 p.m.

ACERs 119TH ANNUAL MEETING

1 – 2 p.m.

ASM 104TH ANNUAL BUSINESS MEETING

4 – 5 p.m.

ASM CANADA COUNCIL SUITE

Experience Canadian hospitality!

EXHIBITION SHOW HOURS

4:30 – 6 p.m.

WELCOME RECEPTION & EXHIBITION GRAND OPENING

4:30 – 6 p.m.

AIST STEEL TO STUDENTS RECEPTION

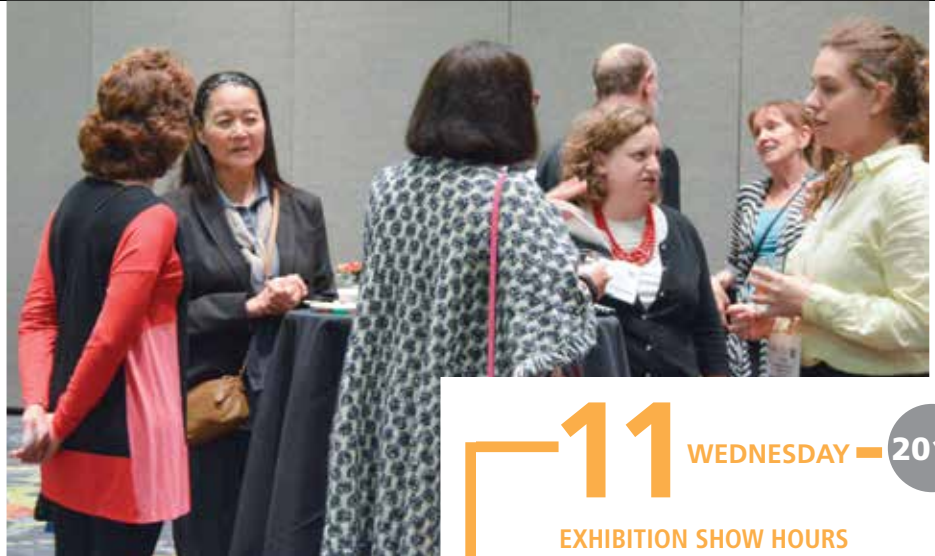
6 – 8 p.m.

ACERs AWARDS DINNER (ticketed event)

6:45 – 10 p.m.

(Reception) 6:45 – 7:30 p.m.

(Banquet) 7:30 – 10 p.m.



10 TUESDAY

ASM MINI-MATERIALS CAMP

9 a.m. – 2 p.m.

EXHIBITION SHOW HOURS

10 a.m. – 6 p.m.

POSTER SESSION

11 a.m. – 6 p.m.

(With presenters) 11 a.m. – 1 p.m.

(General viewing) 1 – 6 p.m.

MS&T FOOD COURT

Noon – 2 p.m.

YOUNG PROFESSIONAL TUTORIAL AND LUNCHEON LECTURE

(Purchase lunch with registration)

Noon – 2 p.m.

Speaker: **Elizabeth Holm**, Carnegie Mellon University

Organized by the TMS Young Professionals Committee

MS&T17 EXHIBIT HAPPY HOUR RECEPTION

4 – 6 p.m.

ASM AWARDS DINNER (ticketed event)

6:15 – 9 p.m.

(Reception) 6:15 – 7 p.m.

(Awards dinner) 7 – 9 p.m.

(President's reception) 9 – 11 p.m.

11 WEDNESDAY — 2017

EXHIBITION SHOW HOURS

9:30 a.m. – 2 p.m.

ASM MINI-MATERIALS CAMP

9:30 a.m. – 2 p.m.

POSTER VIEWING

9:30 a.m. – 2 p.m.

PUBLISH, DON'T PERISH!

"Benefits of Being a Reviewer for Technical Journals."

Noon – 1 p.m.

COMPLIMENTARY EXHIBITOR WORKSHOPS

Metallography Insights

Monday, Oct. 9

9:00 a.m. – Noon

Presented by Struers Inc.

Hands on Techniques: Preparation, Characterization and Analysis of Powder Metals for Additive Manufacturing

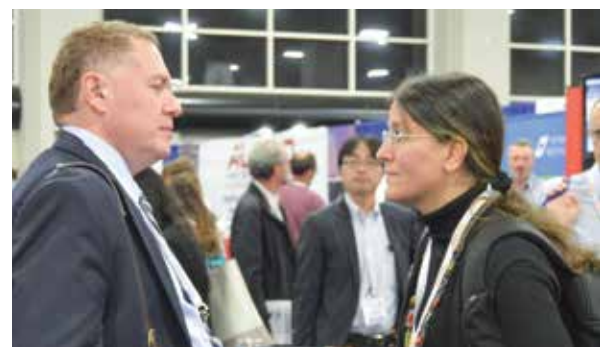
Monday, Oct. 9 – Tuesday, Oct. 10

Half-day sessions

Presented by Verder Scientific

Visit www.matscitech.org for details.

NEW FOR 2017!



REGISTER BEFORE SEPTEMBER 2 TO SAVE!

STUDENT ACTIVITIES

Information subject to change. For more information on student events, visit matscitech.org/students

2017



OCT

8

SUNDAY

CHAPTER LEADERSHIP WORKSHOP – FOR CHAPTER OFFICERS ONLY

10 a.m. – Noon

Meet fellow chapter officers, share best practices, and learn about Material Advantage! This workshop is for chapter officers: chair, vice-chair, secretary, and treasurer. Registration is required for this workshop as well as for MS&T. Visit matscitech.org/students/ to register before **October 1, 2017**.

UNDERGRADUATE STUDENT SPEAKING CONTEST

1 – 4 p.m.

MS&T hosts the semifinal and final rounds of the Material Advantage Undergraduate Student Speaking Contest. This contest encourages undergraduate students to present technical papers, and improve their presentation skills. The presentation subject must be technical but can relate to any aspect of materials science and engineering. One contestant per university may compete. For contest rules, contact Tricia Freshour at tfreshour@ceramics.org. MS&T speaking contestants must be submitted to Tricia by **September 18, 2017**.

STUDENT NETWORKING MIXER

7 – 9 p.m.

Wear your school colors and join this relaxed, casual, and fun atmosphere for students, Material Advantage Faculty advisors, and society volunteer leaders. Music will be provided.

STUDENT CHAPTER TRAVEL GRANTS

The Material Advantage Student Program offers \$500 travel grants to MA chapters—one grant per chapter per academic year! These are awarded on a first-come, first-served basis, so act early! Chapters must be active and in good standing. Apply by **October 1, 2017** at matscitech.org/students.

STUDENT MONITORS

Partially defray your MS&T expenses by serving as a session monitor. Monitors assist session chairs, record session attendance statistics, assist with audio/visual equipment, etc. Find details at matscitech.org/students.

UNDERGRADUATE STUDENT POSTER CONTEST

Undergrads—Participate in the contest to present your undergraduate research and improve your communication skills! The poster

9 MONDAY

EMERGING PROFESSIONALS SYMPOSIUM

8:00 – 11:20 a.m. | 2:00 – 4:40 p.m.

Find out what to expect during those first years after earning your degree at the symposium *Perspectives for Emerging Materials Professionals!*

CERAMIC CAREERS MENTORING ROUNDTABLE

10:45 a.m. – Noon

The Ceramic and Glass Industry Foundation invites all students and young professionals to a complimentary brunch to learn about careers in ceramics! Professionals from the ceramics and glass industry will present brief overviews of jobs in their fields and will circulate from table to table to answer questions and provide career advice. RSVP to braines@ceramics.org by **September 29**.

ACERS STUDENT TOUR

12:30 – 5 p.m.

Join other students on a visit to a ceramic or glass company in Pittsburgh. The tour is open to all MS&T17 student registrants and free to attend. Contact Tricia Freshour at tfreshour@ceramics.org.

AIST STUDENT PLANT TOUR

Noon – 4 p.m.

AIST offers students the opportunity to tour a steel plant while at MS&T 2017 in Pittsburgh. Students registered for the conference by **September 11, 2017** will be contacted by email with details to sign up. Advance registration is required.



10 TUESDAY

CERAMIC MUG DROP CONTEST

11:15 a.m. – 12:15 p.m.

Mugs fabricated by students from ceramic raw materials are judged on aesthetics and strength. Mugs are dropped from varying levels until the breaking threshold is reached. The mug with the highest successful drop distance wins! To enter a mug, contact Brian Gilmore at Brian.Gilmore@pxd.com by Monday, **October 2, 2017**.

CERAMIC DISC GOLF CONTEST

12:30 – 1:30 p.m.

Student-created discs made of ceramic or glass are thrown into a regulation disc golf basket. The disc successfully thrown into the disc golf basket from the farthest distance in the fewest number of shots will win the contest! The most aesthetically pleasing or creative disc will be named "Best Looking" disc. To enter a disc, contact Brian Gilmore at Brian.Gilmore@pxd.com by Monday, **October 2, 2017**.

ASM GEODESIC DOME DESIGN COMPETITION "DOMESDAY"

10:15 a.m. – 1:30 p.m.

Can you build a dome that takes the weight? Students will design and build a dome that will be judged across various criteria for the ASM Geodesic Dome Design Competition! For more information and to register, visit www.asminternational.org/domesday.

STUDENT AWARDS CEREMONY

2 – 3 p.m.

Congratulate the winners of this year's contests: Material Advantage Chapters of Excellence, Student Speaking Contest, Graduate and Undergraduate Poster Contests, Ceramic Mug Drop Contest, Ceramic Disc Golf Contest, TMS Superalloys Awards, AIST/AISI Scholarships, ACerS PCSA Student Competitions, and Keramos National Awards.

must be work of an undergraduate and completed during the student's undergraduate education. The work presented does not have to be performed at the student's home institution, but could be, for example, from a project performed as part of a co-op experience, a summer internship, or a Research Experience for Undergraduates project. To enter the contest, submit your name, title of poster, and an abstract up to 100 words to Tricia Freshour at tfreshour@ceramics.org by **September 18, 2017**.

GRADUATE STUDENT POSTER CONTEST

The contest is open to current graduate students pursuing M.S. or Ph.D. degrees. Posters accepted in the MS&T technical program may be entered in the contest and will be displayed in the general poster session. To include your accepted poster abstract in the contest, contact Tricia Freshour at tfreshour@ceramics.org.

EXHIBITION

EXHIBIT AT MS&T

Meet the Industry ... From the Happy Hour Reception to the Poster Session, MS&T sets the stage for you to meet and network with the materials science and technology industry.

Show Floor Attracts Customers ... 93% of attendees spend more than one hour at the exhibition!

Keep a Pulse on the Industry ... Talk to more than 150 exhibitors and **3,000** attendees! Attend the technical program to find out what's new and where your new opportunities lie.

Powerful Attendees ... More than 50% of attendees have significant purchasing power!

Unique Interdisciplinary Forum ... Metallurgists, ceramists, glass scientists, composites researchers, and other materials scientists—all come to MS&T.

RENTAL RATES

\$3,050 USD | \$100 USD per corner charge | 10' x 10' booth includes:

- One complimentary full conference technical badge
- Unlimited exhibitor staff badges
- Company listing in show directory and online
- Post-conference attendees list (emails not included)

First Time Exhibiting? Discounted booth rates available!

WHY YOU SHOULD EXHIBIT AT MS&T

As an exhibitor, you gain access to more than 3,000 attendees who use products, equipment, materials, and resources to discover new dimensions of structure, properties, processing, and performance of materials.

- **Influencers**—Four out of five attendees significantly influence buying decisions.
- **Professionals**—More than half of attendees are scientists and engineers working at their organizations.
- **Future**—One-fourth of attendees are students—your future customers and your future employees.

ATTRACTIONS ON THE SHOW FLOOR

Poster Session	Mug Drop/Ceramic Disc Golf Contest
Football Feature	DomesDay
Materials Camp	Complimentary Attendee Lunches

SPONSORSHIP & ADVERTISING

- Gain additional brand exposure with sponsorship and advertising. Make sponsorship an integral component of your marketing strategy.
- Custom sponsorship, advertising opportunities and package deals are available!

MS&T ATTENDEES ARE YOUR CUSTOMERS*

MS&T attendees influence buying decisions:

- I am the final decision maker on significant purchases. 14.23%
- I am very influential on significant purchase decisions. 31.50%
- I make recommendations on significant purchases. 26.57%
- I am not involved in significant purchase decisions. 27.70%



Where MS&T attendees work:

- Academic/University 50.86%
- Industry/For-profit Research Laboratory 21.99%
- Government/Laboratory 13.96%
- Other 4.97%
- Consultant 4.40%
- Supplier 3.82%



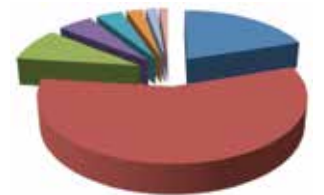
What MS&T attendees do:

- Materials and systems 35.71%
- Fundamentals and Characterization 26.64%
- Product Manufacturing 11.00%
- Education and professional development 11.00%
- Processing 10.62%
- Other 5.02%



Who attends MS&T?

- Engineer/Scientist 57.12%
- Professor/Instructor 19.89%
- Other 8.76%
- Management 5.11%
- Marketing/Sales 3.83%
- Consultant 2.37%
- Retiree 1.64%
- Student 1.28%



*Statistical data from 2016 conference survey.

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HOTEL & REGISTRATION

Reservation deadline: September 15, 2017

For best availability and immediate confirmation, make your reservation online at matscitech.org.

Omni William Penn Hotel – (ACerS HQ)
\$199/night

Renaissance Pittsburgh Hotel – (AIST & TMS HQ)
\$185/night

Westin Convention Center Pittsburgh – (ASM HQ)
\$205/night

DoubleTree by Hilton Hotel & Suites Pittsburgh Downtown
\$185/night

Hampton Inn
\$179/night

Wyndham Grand
\$169/night

U.S. Government Rate rooms are extremely limited; proof of federal government employment must be shown at check-in or higher rate will be charged. U.S. Government rate is the prevailing government rate, as of October 1, 2017, and subject to change.

Cancellation: Reservations cancelled less than 72 hours prior to noon of scheduled arrival date will be charged one night rate and tax.

Audio and Visual Recording of Technical Paper Presentations/Sessions

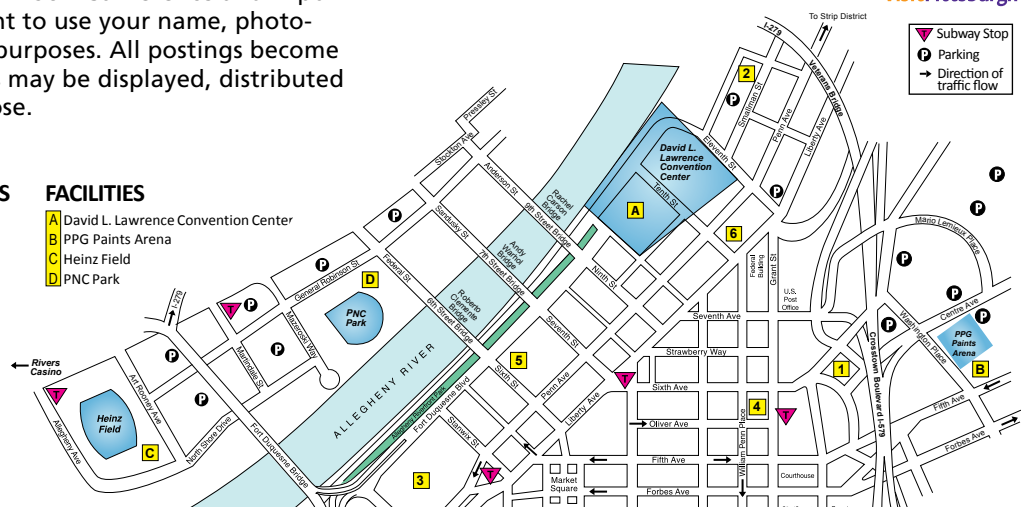
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- 2 Hampton Inn & Suites Downtown
- 3 Wyndham Grand Hotel
- 4 Omni William Penn Hotel
- 5 Renaissance Pittsburgh Hotel
- 6 Westin Convention Center Hotel

FACILITIES

- A David L. Lawrence Convention Center
- B PPG Paints Arena
- C Heinz Field
- D PNC Park



Registration Rates

	On or before 9/2/17	After 9/2/17
Member	\$635	\$760
Nonmember	\$785	\$910
Presenter, Member*	\$585	\$710
Presenter, Nonmember*	\$735	\$860
Student Member	\$135	\$185
Student Nonmember	\$160	\$210
Student Member, Presenter*	\$110	\$160
Student Nonmember, Presenter*	\$135	\$185
One-Day, Member	\$510	\$635
One-Day, Nonmember	\$660	\$785
Exhibit Only	\$25	\$25

*Speakers, Poster Presenters, Organizers, Session Chairs

Badge Pick-up and Onsite Conference Registration

The MS&T Conference registration desk will be located on the 2nd level of the convention center. Advance and onsite registrants may pick-up badges at the registration area during the following hours:

Sunday, October 8	2 p.m. – 7 p.m.
Monday, October 9	7 a.m. – 6 p.m.
Tuesday, October 10	7 a.m. – 6 p.m.
Wednesday, October 11	7 a.m. – 5 p.m.
Thursday, October 12	7 a.m. – 12 p.m.

For quick and easy onsite registration, remember to bring your registration confirmation with bar code identification!

Special Needs

ACerS, AIST, ASM, TMS, the David L. Lawrence Convention Center and all conference hotels are striving to accommodate all guests with special needs. If you require access to modified housing or other assistance, please provide this information in detail on both your conference registration and housing forms

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