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# MS&T'11<sup>®</sup>

**Materials Science & Technology  
2011 Conference & Exhibition**

OCTOBER 16–20, 2011 | COLUMBUS, OHIO USA

## Advance Program

Register before September 23 to save up to \$175.

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

[www.matscitech.org](http://www.matscitech.org)

We look forward to seeing you in Columbus at what promises to be the premier materials event of the year!

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**The American Ceramic Society (ACerS)** strives to advance the study, understanding and use of ceramic and glass materials for the benefit of our membership and the materials community. You won't want to miss the camaraderie as we celebrate our 113th anniversary. Join your colleagues Monday evening for the **ACerS Annual Honors and Awards Banquet**, and watch the induction of the 2011 Fellows class and awards presentation. Not only does MS&T'11 feature a Ceramic and Glass Materials theme, but it also plays host to these ceramic materials lectures: **Frontiers of Science and Society—Rustum Roy Lecture** on Sunday; **Arthur L. Friedberg Memorial Lecture** and **Edward Orton Jr. Memorial Lecture** on Tuesday; and **Robert B. Sosman Lecture and Symposium** on Wednesday. Participate in all the ceramic-focused sessions, including the **Richard M. Fulrath Award Session** and the **Alfred R. Cooper Session and Award** on Monday. Continue to expand your professional expertise after MS&T'11 by attending ACerS Short Courses: Modern Statistics, Data Analysis, and Specimen/Structural Reliability Modeling, Fundamentals of Glass Science and Technology & Fractography Lab, or Sintering of Ceramics. During the conference, stop by the Member Lounge to relax between sessions, network with peers and take a spin on the prize wheel. Visit ACerS at [www.ceramics.org/annualmeeting](http://www.ceramics.org/annualmeeting).

**Association for Iron & Steel Technology (AIST)** is committed to supporting research and development activities and collaborations as they relate to steel processing, products, and application under the broader and more universal umbrella of materials science. The **Steel Properties & Applications Conference** will feature symposia addressing a broad range of steel topics, including recent advances in processing and properties of zinc-coated advanced high-strength steels; the processing, microstructure, and properties of cast irons and cast and forged specialty steels; the latest developments in austenite formation and decomposition, including multiphase steels, characterization at the atomic and mesoscale, and solute effects on austenite decomposition kinetics; developments in steel processing, including steelmaking and casting, alloying and thermal/mechanical processing, and pipeline, tube, and plate steel processing; and steel product metallurgy and applications, including the performance and microstructure of multiphase steels, microstructure and mechanical property relationships, precipitation studies, the development of high-Mn steels, and steel welding processing and property relationships. This year's program will include the **Adolf Martens Memorial Steel Lecture** Wednesday, October 19<sup>th</sup>. Proceedings of steel-related papers will be published and available for sale. Visit AIST at [aist.org](http://aist.org).

**NACE International**, The Corrosion Society, is the world's largest and most recognized association for corrosion control. With over 26,000 members in 110 countries, NACE International is dedicated to protecting people, assets and the environment from the effects of corrosion through training and certification programs, conferences, industry standards, reports, and publications. The association is involved in every industry and area of corrosion prevention and control, from chemical processing and water systems, to transportation and infrastructure protection. Visit NACE at [www.nace.org](http://www.nace.org).

**ASM International® (ASM)** is hosting several events to recognize our leaders and visionaries. Join us Monday for the Plenary Session and the **ASM/TMS Distinguished Lecture in Materials and Society**. Presented by Subra Suresh, U.S.N.F. "Innovation Ecosystems: Where do we go from here?" is supported by a technical session. Attend the **ASM Leadership Awards Luncheon** where ASM organizational unit awards are presented. All awardees will receive an invite to attend. Others may purchase tickets via the registration form. Join us for the **ASM 98th Annual Meeting** where officers are elected for the 2011-12 term and ASM business is addressed. The **Alpha Sigma Mu** Lecturer is Charles A. Parker of Honeywell Aerospace presenting "Technical Challenges of Commercial Aircraft Wheels and Brakes." On Tuesday, the **Edward DeMille Campbell Memorial Lecture** will be presented by Martin E. Glicksman, Univ. of Florida. The lecture is entitled "The Roles of Determinism and Noise in Dendritic Growth." You won't want to miss the **ASM Awards Dinner** Tuesday evening! Join us in celebrating the accomplishments of this year's award recipients and the 2011 Class of Fellows. Tickets, which include the President's Reception, may be purchased via the registration form. Experience Canadian hospitality Monday and Tuesday at the **ASM Canada Council Suite!** Visit ASM at [www.asminternational.org](http://www.asminternational.org).

**The Minerals, Metals & Materials Society (TMS)**, one of the founding partners of the MS&T Conference, continues to support cooperative and collaborative efforts, which benefit the materials community at large. International in both its membership and activities, TMS has historically been a leader in fostering the exchange of learning and ideas across the spectrum of materials science and engineering, from minerals processing and primary metals production to basic research and the advanced applications of materials. Of particular interest to TMS and its members has been the role of MSE in addressing both short- and long-term energy challenges. In addition to traditional meeting programming and publication, TMS has partnered with other societies on an array of projects and government-funded studies to address materials-related energy issues. Building on this core strength of convening a wide range of talents and perspectives around common goals, TMS established TMS Energy—its strategic initiative focused on providing leadership, facilitation, and resources that establish and support effective energy solutions based on the innovative development and use of materials. Detailed information on TMS Energy projects, access to the full reports and studies released by these projects, links to supporting resources and summary articles, and information on ways to become involved are available at <http://energy.tms.org>. Visit TMS at [www.tms.org](http://www.tms.org).

## Grasping Excellence: Opportunities for Science and Engineering Research, Education and Workforce Development in the United States

Monday, October 17, 2011 | 8:30 a.m. to Noon | Ballroom 1 | A Q&A session will follow the presentations.



Subra Suresh

**Subra Suresh**, Director, United States National Science Foundation

Title: **Innovation Ecosystems: Where do we go from here?**

Abstract: For many decades, materials scientists in the U.S. have led the world in innovation, creating opportunities for the private sector and good jobs. With global competition reaching a red-hot pitch, we need to consider the challenges that lie ahead for continued leadership. Two of these challenges have long-term consequences for the vitality of American enterprise and quality of life. The first challenge is to develop a world-class scientific workforce; the second is to ease and accelerate the transition from research to new products, processes and services. Efficient translation capitalizes on the output of fundamental research that serves as the engine of the innovation ecosystem. Numerous reports have identified fault lines in current STEM education practices and barriers to the commercialization of research results. The concept of an innovation ecosystem provides a bridge between these two challenges by describing the interactions among people, institutions and enterprises from which innovation emerges. Understanding these links can help us design better practices and policies to revitalize American innovation.

Biography: Suresh is director of the U.S. National Science Foundation. He served previously as Dean of the Engineering School and Vannevar Bush Professor of Engineering at the Massachusetts Institute of Technology. A mechanical engineer interested in materials science and biology, Suresh pioneered research to understand the mechanical properties of materials, and most recently tackled the biomechanics of red blood cells under the influence of diseases such as malaria. In 2006, *Technology Review* magazine selected his work on nanobiomechanics as one of the top 10 emerging technologies that "will have a significant impact on business, medicine or culture." He has authored more than 230 research articles in international journals and is a co-inventor in more than 18 U.S. and international patent applications. He is author or co-author of several books. He successfully leveraged his research and leadership positions in academia to increase the number of women and minority engineers. He personally mentored more than 100 engineers and scientists in his research group. As department head and dean of engineering, he also led a successful campaign to increase the number of women among MIT's engineering faculty ranks. He has received many prestigious awards, including the Padma Shri Award (2011) for the President of India and the Indian Science Congress General President's Award (2011).



Carl Wieman

**Carl E. Wieman**, Associate Director for Science, Office of Science and Technology Policy, The White House

Title: **Taking a Scientific Approach to Learning and Teaching STEM**

Abstract: Guided by experimental tests of theory and practice, science has advanced rapidly in the past 500 years. Meanwhile, guided primarily by tradition and dogma, science education has remained largely medieval. Taking a research approach to teaching STEM subjects is now revealing principles and practices that achieve much better learning than traditional approaches. The combination of this research approach to instruction and modern information technology is setting the stage for a major advance in STEM education, an advance that can provide the relevant and effective science education for all students that is needed for

### Organizing Committee:

**David K. Matlock** (AIST - Chair), Colorado School of Mines, USA; **George G. Wicks** (ACerS), Savannah River National Lab, USA; **Christopher Berndt** (ASM), Swinburne University of Technology, Australia; **Kevin Hemker** (TMS), Johns Hopkins University, USA.

the 21st century. Wieman will discuss the failures of traditional educational practices, even as used by very good teachers, and the successes of some new practices and technology that characterize this more effective approach, and how these results are consistent with findings from cognitive science.

Biography: Wieman serves as the Associate Director for Science at the White House Office of Science and Technology Policy. In that position he oversees the federal research and development enterprise and federal science, technology, engineering, and math education initiatives. Previously he divided his time between the University of British Columbia and the University of Colorado, where he served as both the Director of Collaborative Science Education Initiatives, aimed at achieving widespread improvement in undergraduate science education, and as a Professor of Physics. Wieman was awarded the Nobel Prize in Physics (2001) for the creation of a new form of matter known as Bose-Einstein condensation, the National Science Foundation's Distinguished Teaching Scholar Award (2001), the Carnegie Foundation's U.S. University Professor of the Year Award (2004), and the American Association of Physics Teachers' Oersted Medal (2007) for his work on science education.



Jeff Wadsworth

**Jeffrey Wadsworth**, President and CEO, Battelle Memorial Institute

Title: **Responding to Increasing Energy, Environmental, Health and National Security Challenges — Investment, Policy and Talent Issues**

Abstract: There is no doubt that world population is growing significantly and in a geographically uneven manner. Fueled in part by the Internet, the worldwide expectations for energy usage and access have rapidly increased. Accompanying new demands for energy generation are interwoven challenges in environmental, health, and national security arenas. These challenges require increases in USA competitiveness with respect to R&D spending, innovation, education, and talent. It is quite clear that the source terms for talent cannot meet future U.S. needs. Materials science and engineering offers one pathway to attract talent into the fields needed to meet these challenges. Observations on these topics will be presented, as will the need to better connect technical advances with national policy decision-making.

Biography: Wadsworth is President and CEO of Battelle Memorial Institute, the world's largest nonprofit R&D organization, headquartered in Columbus, Ohio. He worked at Stanford, Lockheed, and Lawrence Livermore National Laboratory, joining Battelle in 2002, as part of the White House Transition Planning Office for the Department of Homeland Security (DHS). He was then director of Oak Ridge National Laboratory, and subsequently headed Battelle's Global Laboratory Operations, directing laboratories for the U.S. Department of Energy, DHS, and others. He earned bachelor's and doctoral degrees at Sheffield University in England and has published 300 scientific papers, one book, and four U.S. patents. He has five honorary doctorates, Fellowships in three technical societies, and is a member of the National Academy of Engineering. As a board member of Achieve, Inc. and the Business-Higher Education Forum, he is helping to lead national efforts to enhance science, technology, engineering and math education. He also is strengthening education and the economy in central Ohio through his engagement with local civic and community organizations.

	Mon PM	Tue AM	Tue PM	Wed AM	Wed PM	Thu AM	Thu PM
<b>BIOMATERIAL TECHNOLOGY</b>							
Emerging Frontiers in Surface Engineering of Biomaterials	•	•	•				
Next Generation Biomaterials	•	•	•	•	•	•	•
Surface Properties of Biomaterials	•	•	•	•	•		
<b>CERAMIC AND GLASS MATERIALS</b>							
ACerS Sosman Award Symposium: Interface Structure and Microstructure Evolution in Ceramics				•			
Ceramic Matrix Composites	•	•	•	•	•	•	
Glass and Optical Materials	•	•	•	•		•	
Innovative Processing and Synthesis of Ceramics, Glasses and Composites	•	•	•	•	•		
Multifunctional Oxides	•	•	•				
Refractory Materials				•			
Solution-based Processing for Ceramic Materials					•	•	•
<b>ELECTRONIC AND MAGNETIC MATERIALS</b>							
Advances in Dielectric Materials and Electronic Devices	•	•	•	•	•		
Magnetoelectric Multiferroic Thin Films and Multilayers		•	•				
Pb-free Solders and Next Generation Interconnects	•	•	•	•			
Semiconductor Heterostructures: Theory, Growth, Characterization and Device Applications	•						
<b>ENVIRONMENTAL AND ENERGY ISSUES</b>							
Energy Conversion/Fuel Cells	•	•	•	•	•		
Energy Storage: Materials, Systems and Applications	•	•	•	•	•	•	
Materials Degradation in Alternative Energy Systems							•
Materials for Nuclear Waste Disposal and Environmental Cleanup					•	•	•
Materials Science Challenges for Nuclear Applications	•	•	•	•	•	•	
<b>FUNDAMENTALS AND CHARACTERIZATION</b>							
Advanced Developments in Electron Microscopy				•	•	•	
Amorphous Materials: Common Issues Within Science and Technology				•		•	•
Deformation and Transitions at Grain Boundaries	•	•	•	•	•	•	
Hardness Across the Multi-Scales of Structure and Loading Rate	•	•	•	•	•	•	
Integrated Computational Materials Engineering: Modeling and Simulation Applied to Metals Processing		•	•	•	•	•	
Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches — Fundamental and Engineering Issues	•	•	•	•	•	•	•
International Symposium on Defects, Transport and Related Phenomena	•	•	•	•	•	•	
Multi-scale Modeling of Microstructure Deformation in Material Processing	•	•					
Nano- and Atomic-Scale Fracture	•	•	•				
Phase Stability, Diffusion, Kinetics and their Applications (PSDK-VI)	•	•	•	•	•		
Recent Advances in Structural Characterization of Materials		•	•	•	•	•	
<b>IRON AND STEEL</b>							
Advances in Zinc-based Coating Technologies for Steel Sheet						•	
Processing, Microstructure and Properties of Cast Irons, and Cast and Forged Specialty Steels					•	•	•
Recent Developments in Steel Processing			•	•			
Steel Product Metallurgy and Applications	•	•	•	•	•	•	•

	Mon PM	Tue AM	Tue PM	Wed AM	Wed PM	Thu AM	Thu PM
<b>MATERIALS-ENVIRONMENT INTERACTIONS</b>							
Advanced Protective Coatings for Refractory Metals and Alloys	•	•	•	•			
Corrosion Protection through Metallic and Non-metallic Coatings				•	•	•	
Environmentally Assisted Cracking of Materials	•	•	•	•			
Green Technologies for Materials Manufacturing and Processing III	•	•	•	•			
Localized Corrosion: Measurement, Mechanisms and Mitigation	•	•					
<b>MATERIALS PERFORMANCE</b>							
Beyond Property Measurement: Mechanical Behavior of Multifunctional Materials Systems	•						
Failure Analysis and Prevention	•	•	•	•	•	•	•
Fatigue and Microstructure: A Symposium on Recent Advances	•	•	•	•	•	•	•
Measurements and Modeling of Advanced Automotive and Structural Materials at Intermediate and High Strain Rates					•	•	•
Periodic Cellular Materials						•	•
Prof. K.K. Chawla Honorary Symposium on Fibers, Foams, and Composites: Science and Engineering	•	•	•	•	•	•	
Shape Memory Alloys	•	•	•				
Structural Materials for Aerospace and Defense: Challenges and Prospects				•	•	•	•
Titanium Processing and Applications						•	•
<b>NANOTECHNOLOGY</b>							
Controlled Synthesis Processing and Applications of Structural and Functional Nanomaterials	•	•	•	•	•	•	•
International Symposium on Advances in Nanostructured Materials and Applications: The 2011 Acta Materialia Gold Medal Symposium	•	•	•	•	•	•	•
Nanotechnology for Energy, Healthcare and Industry				•	•	•	•
Synthesis, Properties and Applications of Noble Metal Nanostructures						•	•
<b>PROCESSING AND PRODUCT MANUFACTURING</b>							
Additive Manufacturing of Metals	•	•	•	•	•	•	
Advances in Manufacturing Technologies	•	•	•	•			
Characterization and Modeling of the Performance of Advanced Alloys for the Transportation Industry— Bridging the Data Gap II		•	•	•	•		
Joining and Sustaining of Superalloys				•	•		
Joining of Advanced and Specialty Materials (JASM XIII)	•	•	•	•	•	•	
Laser Applications in Materials Technology II	•	•					
Microwave Processing of Materials					•	•	•
Novel Sintering Processes and News in Traditional Sintering and Grain Growth	•	•	•	•	•		
Particulate Composites				•	•		
Surface Protection for Enhanced Materials Performance: Science and Technology	•	•	•	•	•		
<b>SPECIAL TOPICS AND LECTURES</b>							
Richard M. Fulrath Award Session	•						
Continuous Improvement of Academic Programs (and Satisfying ABET Along the Way): The Elizabeth Judson Memorial Symposium	•	•					
General Poster Session		•	•	•	•		
Journal of Undergraduate Materials Research			•				
Perspectives for Emerging Materials Professionals: Early Strategies for Career Development		•	•				
Student Career Development	•						

### BIOMATERIAL TECHNOLOGY

- **Emerging Frontiers in Surface Engineering of Biomaterials**
  - Smart Surfaces, Nano Structure and Systems
  - Biocoatings and Surface Engineering
  - Biocoatings and Surface Protection
- **Next Generation Biomaterials**
  - Ceramic Biomaterials
  - Tissue Engineering
  - Metallic, Polymeric, and Ceramic Biomaterials
  - Advanced Biomaterials
  - Next Generation Biomaterials
  - Biomaterials Science and Technology
  - Biomaterials Engineering
  - Frontiers in Biological and Biomedical Materials
- **Surface Properties of Biomaterials**
  - Drug Delivery
  - Biopolymers and Surface Modifications
  - Bioglass and Cellular Interactions
  - Antimicrobial Coatings and Surface Analysis
  - Surface Modification

### CERAMIC AND GLASS MATERIALS

- **Ceramic Matrix Composites**
  - Foreign Object Damage
  - Environmental Effects/Coatings
  - CMC Applications
  - Processing/Fabrication
  - Mechanical Behavior
  - Modeling/Characterization
- **Glass and Optical Materials**
  - Cooper Award Session on Glass Relaxation
  - Optical Materials I
  - Optical Materials II
  - Glass Modeling and Simulation I
  - Glass Modeling and Simulation II
  - Structure-Properties Relationship in Glass
  - Structure and Properties Characterization in Glass

- **Innovative Processing and Synthesis of Ceramics, Glasses and Composites**
  - Novel Synthesis and Processing
  - Bio-and Electro-Ceramics, Films and Coatings
  - Advanced Processing and Characterization
  - Processing and Microstructure-Property Relationships
  - CVD, Plasma Spray, Inkjet and Laser Processing
- **Multifunctional Oxides**
  - Session I
  - Session II
  - Session III
  - Session IV
  - Session V
- **Refractory Materials**
  - Refractory Ceramics General Session
- **Solution-Based Processing for Ceramic Materials**
  - Solution Synthesis of Ceramic Powders and Structures
  - Solution Deposition, Assembly, and Patterning of Functional Films and Structures
  - Electric Field-Assisted Fabrication and Assembly

### ELECTRONIC AND MAGNETIC MATERIALS

- **Advances in Dielectric Materials and Electronic Devices**
  - Materials Synthesis, Preparation and Processing
  - Materials Preparation and Properties
  - Materials and Applications I
  - Processing-Property-Microstructure Relationship
  - Materials and Applications II
- **Magnetolectric Multiferroic Thin Films and Multilayers**
  - Multiferroic Materials
  - Magnetolectric Microstructures and Properties
- **Pb-Free Solders and Next Generation Interconnects**
  - Next Generation Interconnects
  - Electromigration and Reliability Issues of Pb-Free Solders
  - Electrically Conductive Adhesives
  - Microstructure, Crystallography and Mechanical Behavior of Pb-free Solders
- **Semiconductor Heterostructures: Theory, Growth, Characterization and Device Applications**
  - Session I

### ENERGY ISSUES

- **Energy Conversion/Fuel Cells**
  - System, Stack and Component Design
  - Heterogeneous Functional Materials for Energy Systems
  - Electrolyte Materials
  - Electrode Materials
  - Interconnect Coatings
- **Energy Storage: Materials, Systems and Applications**
  - Energy Storage for Transportation Applications I
  - Energy Storage for Transportation Applications II
  - Energy Storage for Transportation Applications III
  - Flow, Li-Air, and Other Batteries
  - Hydrogen Storage and Thermoelectric Materials
  - Na-Batteries



- **Materials Degradation in Alternative Energy Systems**
  - Session I
- **Materials for Nuclear Waste Disposal and Environmental Cleanup**
  - Waste Forms for Nuclear Disposition
  - Materials and Processes for Nuclear Materials Storage and Handling
  - Processing and Characterization of Salts for Nuclear Waste Disposal
  - Vitrification and Glass Characterization for Nuclear Materials Disposal

- **Materials Science Challenges for Nuclear Applications**
  - Ion Irradiation Effects
  - Defects in Irradiated Alloys
  - Simulation of Reactor Materials
  - Defects and Diffusion in Materials
  - Nanostructured Materials
  - Microstructure Evolution
  - Nuclear Fuels I
  - Nuclear Fuels II
  - Materials Degradation I
  - Materials Degradation II
  - High Temperature Materials



## FUNDAMENTALS AND CHARACTERIZATION

- **Advanced Developments in Electron Microscopy**
  - Novel Microscopy Techniques
  - Advanced Materials Applications
  - In Situ Techniques
- **Amorphous Materials: Common Issues Within Science and Technology**
  - Glass in 21st Century
  - Mechanical Properties of Glass I
  - Mechanical Properties of Glass II
  - Metallic Glass I
  - Metallic Glass II
  - Glass Technology
- **Deformation and Transitions at Grain Boundaries**
  - Boundary Characterization Methodology
  - Deformation Twins and Dislocations Interactions with Grain Boundaries
  - Anisotropy Effects on Grain Boundaries
  - Deformation Effects at Grain Boundaries
  - Nanocrystalline Grain Boundary Processes
  - Effects of Defects and Chemistry on Grain Boundaries
- **Hardness Across the Multi-Scales of Structure and Loading Rate**
  - Stress-Strain Relations
  - Structural Aspects I
  - Structural Aspects II
  - Loading Rate Aspects
  - Applications I
  - Applications II
- **Integrated Computational Materials Engineering: Modeling and Simulation Applied to Metals Processing**
  - Materials and Manufacturing Process Modeling and Simulation
  - Materials Modeling Fundamentals and Applications to Phase Transformation and Microstructure Evolution
  - Modeling and Simulation of Casting Processes and Associated Microstructure Evolution
  - Elements of ICME: Databases, Microstructure Characterization, and Microstructure and Mechanical Property Prediction
  - Modeling and Simulation of Deformation and Associated Microstructure and Mechanical Properties

- **Interfaces, Grain Boundaries and Surfaces from Atomistic and Macroscopic Approaches — Fundamental and Engineering Issues**
  - Bridging the Gap between Continuum and Atomistic Approaches for Interfaces
  - Interface Dynamics
  - Interface Engineering
  - Interfaces in Polycrystals
  - Interfaces, 3-Lines and Wetting
  - Complex Interfaces
  - Interfaces and Charge Storage
- **International Symposium on Defects, Transport and Related Phenomena**
  - Defects and Transport in Ceramics I
  - Defects and Transport in Ceramics II
  - Defects and Transport in Ceramics III
  - Defects and Transport in Ceramics IV
  - Defects and Transport in Materials Related to Fuel Cells I
  - Defects and Transport in Materials Related to Fuel Cells II
- **Multi Scale Modeling of Microstructure Deformation in Material Processing**
  - Session I
  - Session II
- **Nano- and Atomic-Scale Fracture**
  - Atomistics of Fracture
  - Environmental Effects
  - Nanowires
- **Phase Stability, Diffusion, Kinetics and their Applications (PSDK-VI)**
  - Session Honoring John W. Cahn, Recipient of ASM's 2011 J. Williard Gibbs Phase Equilibria Award
  - Phase Stability and Diffusional Processes I
  - Diffusion Modeling and Measurement
  - Alloy Design and Phase Stability Modeling
  - Phase Stability and Diffusional Processes II
- **Recent Advances in Structural Characterization of Materials**
  - Electron Backscatter Diffraction
  - Tomographic and Imaging Methods
  - Scattering Methods
  - Spectroscopic Methods
  - Advanced Methods and Applications



## IRON AND STEEL

- **Advances in Zinc-Based Coating Technologies for Steel Sheet**
  - Advances in Processing and Characterization of Zinc-Coated Steel Sheet
- **Processing, Microstructure and Properties of Cast Irons and Cast and Forged Specialty Steels**
  - Forged and Specialty Steels
  - Cast Irons
  - Cast and Rolled Steels
- **Recent Developments in Steel Processing**
  - Session I
  - Session II
- **Steel Product Metallurgy and Applications**
  - Advanced High Strength Steels I
  - Advanced High Strength Steels II
  - Tubular and Plate Products
  - Alloying and Precipitation
  - Processing and Performance I
  - Processing and Performance II

## MATERIALS-ENVIRONMENT INTERACTIONS

- **Advanced Protective Coatings for Refractory Metals and Alloys**
  - Recent Development in Oxidation Resistant Refractory Metal Alloys, Composites and Protective Coating Materials I
  - Recent Development in Oxidation Resistant Refractory Metal Alloys, Composites and Protective Coating Materials II
  - Oxidation Modeling, Synthesis and Performance of Alumina Stabilizing Coatings
  - Strategies, Synthesis and Performance of Silicide Coatings
- **Corrosion Protection Through Metallic and Non-Metallic Coatings**
  - Metallic and Refractory Coatings
  - Mechanism and Evaluation
  - Polymeric and Conversion Coatings
- **Environmentally Assisted Cracking of Materials**
  - Session I
  - Session II
  - Session III
  - Session IV
- **Green Technologies for Materials Manufacturing and Processing III**
  - Green Manufacturing I
  - Green Materials Processing I
  - Green Manufacturing II
  - Green Materials Processing II
- **Localized Corrosion – Measurement, Mechanisms and Mitigation**
  - Light Metals
  - High Temperature Corrosion
  - Assorted Effects

## MATERIALS PERFORMANCE

- **Beyond Property Measurement — Mechanical Behavior of Multifunctional Materials Systems**
  - Mechanical Characterization across Multi-Functional Systems
- **Failure Analysis and Prevention**
  - Corrosion and Coatings
  - Fatigue and Fracture
  - Composites
  - Welding, Joining and General Interest
  - Tools and Techniques
  - Aerospace
  - Fasteners
  - General Topics in Failure Analysis
- **Fatigue and Microstructure: A Symposium on Recent Advances**
  - Damage Accumulation
  - Crack Initiation
  - Dual-Mode Fatigue
  - Fatigue of Advanced Materials
  - Fatigue on Small Scales
  - Very High Cycle Fatigue
  - Crack Growth and Fracture
- **Measurements and Modeling of Advanced Automotive and Structural Materials at Intermediate and High Strain Rates**
  - Intermediate-to-High-Rate Material Behavior
  - Intermediate-to-High-Rate Measurement Techniques
  - Intermediate-to-High-Rate Modeling and Measurement
- **Periodic Cellular Materials: Current Status and Recent Progress**
  - Lattice Truss Structures
  - Gasarites, Foams, and Other Materials
- **Professor K.K. Chawla Honorary Symposium on Fibers, Foams and Composites: Science and Engineering**
  - Foams I
  - Metal Matrix Composites/Ceramic Matrix Composites I
  - Foams II
  - Metal Matrix Composites/Polymer Matrix Composites
  - Fibers
  - Metal Matrix Composites/Ceramic Matrix Composites II
- **Shape Memory Alloys**
  - Advanced Alloys
  - Alloy Development and Behavior
  - Alloy Behavior
- **Structural Materials for Aerospace and Defense: Challenges and Prospects**
  - Composites and Nanocomposites
  - Aluminum and Titanium Alloys
  - Nickel-Based and New Alloys
  - Methods of Processing and Properties of Alloys
  - Magnesium Alloys
- **Titanium Processing and Applications**
  - Session I
  - Session II



### NANOTECHNOLOGY

- **Controlled Synthesis, Processing and Applications of Structural and Functional Nanomaterials**
  - Zero Dimension Nanomaterials
  - One Dimensional Nanomaterials I
  - One Dimensional Nanomaterials II
  - Two Dimensional Nanomaterials
  - Three Dimensional Nanomaterials I
  - Three Dimensional Nanomaterials II
  - Nanomaterial Applications
  
- **International Symposium on Advances in Nanostructured Materials and Applications: The 2011 Acta Materialia Gold Medal Symposium**
  - Multidisciplinary Research in Nanomaterials
  - Nanoceramics I: Oxides and Thin Film Interfaces
  - Nanometals I: Deformation Mechanisms in Nanostructured Metals
  - Nanometals II: Size Effects in Metals, Nanotwins, Nanolayers and Others
  - Nanoceramics II: Nanomaterials and Their Applications
  - Nanoscale Characterizations and Carbon Related Nanomaterials
  - Nanometals III: Bulk Nanostructured Metals
  
- **Nanotechnology for Energy, Healthcare and Industry**
  - Session I
  - Session II
  - Session III
  - Session IV
  
- **Synthesis, Properties and Applications of Noble Metal Nanostructures**
  - Fabrication and Characterization of Noble Metal Nanoparticles
  - Functional Metal Thin Films

### PROCESSING AND PRODUCT MANUFACTURING

- **Additive Manufacturing of Metals**
  - Additive Manufacturing: An Array of Processes
  - Additive Manufacturing: General Session
  - Electron Beam Melting (EBM) I
  - Ultrasonic and Other Solid State Additive Manufacturing
  - Laser-Based AM Processes
  - Electron Beam Melting (EBM) II
  
- **Advances in Manufacturing Technologies**
  - Materials and Processing
  - Forming, Shaping and Issues
  - Machining, Joining and Issues
  - Advanced Manufacturing Techniques
  
- **Characterization and Modeling of the Performance of Advanced Alloys for the Transportation Industry — Bridging the Data Gap II**
  - Assessing the Technical Challenges with Advanced Lightweight Alloys
  - Predicting the Mechanical Behavior of Advanced Lightweight Alloys
  - Evaluating the Performance of Advanced Lightweight Alloys I
  - Evaluating the Performance of Advanced Lightweight Alloys II
  
- **Joining and Sustaining of Superalloys**
  - Joining and Sustaining of Ni-Base Superalloys: Part I
  - Joining and Sustaining of Ni-Base Superalloys: Part II

- **Joining of Advanced and Specialty Materials (JASM XIII)**
  - Solid State Joining
  - Welding Consumables
  - Welding Metallurgy
  - Micro and Nano Joining I
  - Micro and Nano Joining II
  - Welding Technologies and Applications
  
- **Laser Applications in Materials Technology II**
  - Mechanical Properties of Additive Manufactured Materials and Components
  - Laser Materials Processing
  
- **Microwave Processing of Materials**
  - Session I
  - Session II
  - Microwave Technology
  
- **Novel Sintering Processes and News in Traditional Sintering and Grain Growth**
  - Energetics and Fundamentals of NanoSintering
  - Field Assisted and Nanosintering I
  - Field Assisted and Nanosintering II
  - Field Assisted and Nanosintering III
  - Field Assisted and Nanosintering IV
  
- **Particulate Composites**
  - Session I
  - Session II
  - Session III
  
- **Surface Protection for Enhanced Materials Performance: Science and Technology**
  - Wear-Resistant and Tribological Coatings
  - Environmental Coatings
  - Thermal Barrier Coatings
  - Advanced Processing/Multi-Functional Coatings I
  - Advanced Processing/Multi-Functional Coatings II

### SPECIAL TOPICS AND LECTURES

- **Continuous Improvement of Academic Programs (and Satisfying ABET Along the Way): The Elizabeth Judson Memorial Symposium**
  - The Engineering Accreditation Process
  - Best Practice in Program Improvement
  
- **General Poster Session**
  - Session I
  
- **Journal of Undergraduate Materials Research**
  - Session I
  
- **Perspectives for Emerging Materials Professionals: Early Strategies for Career Development**
  - Session I
  - Session II
  
- **Richard M. Fulrath Award Session**
  - Session I
  
- **Student Career Development**
  - Session I



### Program Coordinating Committee

- Chair and ACerS Representative  
Ivar Reimanis
  
- AIST Representative  
Stephanie K. Will
  
- ASM Representative  
Tom Lienert
  
- TMS Representative  
Awadh B. Pandey
  
- NACE International Representatives  
Narasi Sridhar  
Julio Maldonado

CC = Columbus Convention Center; HY = Hyatt; CR = Crowne; REN = Renaissance

Event	Time	Location	Event	Time	Location	Event	Time	Location	Event	Time	Location
<b>SUNDAY, OCTOBER 16</b>			<b>Social Functions</b>			<b>THURSDAY, OCTOBER 20</b>			<b>THURSDAY, OCTOBER 20</b>		
<b>Conference Activities</b>			MS&T Guest Tour – Woodhaven Cooking School	9:30 a.m. to 3:15 p.m.		<b>Material Advantage Student Functions</b>			<b>Conference Activities</b>		
MS&T Press Room	7:30 a.m. to 6 p.m.	CC	ASM Leadership Luncheon	11:45 a.m. to 1 p.m.	HY	Undergraduate Student Poster Contest Display	7 a.m. to 6 p.m.	CC	Authors' Coffee	7 to 8 a.m.	CC
Registration	2 to 7:30 p.m.	CC	ASM Tuxedo Pick-up	1 to 6 p.m.	HY	Material Advantage Mug Drop Contest	11:15 a.m. to 12:15 p.m.	CC	Registration	7 a.m. to 2 p.m.	CC
Society Member Lounges	2 to 7:30 p.m.	CC	MS&T Women in Materials Science Reception	5:30 to 6:30 p.m.	CC	Material Advantage Putter Contest	12:15 to 1:15 p.m.	CC	Society Member Lounges	7 a.m. to 2 p.m.	CC
ACerS/BSD Ceramographic Display	2 to 7:30 p.m.	CC	Univ. of Illinois Alumni Reception	5:30 to 7 p.m.	HY	Student Awards Ceremony	2 to 3 p.m.	CC	MS&T Press Room	7:30 a.m. to 6 p.m.	CC
Welcome Reception	6 to 7:30 p.m.	CC	Acta Materialia Gold Medal & NC State Alumni Reception	5:30 to 8 p.m.	CC				<b>Educational Courses</b>		
<b>Lectures</b>			Purdue Materials Engineering Alumni/Friends Reception	6 to 7:30 p.m.	Off-Site	<b>Social Functions</b>			Achieving Your Goals Through Effective Communication	8:30 a.m. to 5:30 p.m.	HY
Frontiers of Science & Society – Rustum Roy Lecture	5 to 6 p.m.	CC	Michigan Technological University MSE Reception	6 to 8 p.m.	CC	ASM Tuxedo Pick-up	7 a.m. to 4 p.m.	HY	Fundamentals of Glass Science and Technology, Fractography Lab	8:30 a.m. to 5:30 p.m.	CR
<b>Material Advantage Student Functions</b>			Professor Krishan Chawla Honorary Dinner	6:30 to 9:30 p.m.	CR	ASTM Committee C08 Meeting on Refractories	8 a.m. to 5 p.m.	HY	Materials Enabled Design	8:30 a.m. to 5:30 p.m.	HY
Chapter Leadership Workshop	10 a.m. to Noon	HY	AIST Foundation Student Recruiting Reception	7 to 9 p.m.	HY	MS&T Guest Tour – Franklin Park Conservatory	9:30 a.m. to 2:15 p.m.	HY	Microstructures 101 and Beyond	8:30 a.m. to 5:30 p.m.	HY
Career Development Sessions	1 to 4 p.m.	HY	ACerS Annual Honors & Awards Banquet	7:30 to 9:30 p.m.	REN	MS&T Young Professionals Reception	5 to 6 p.m.	CC	Sintering of Ceramics	8:30 a.m. to 5:30 p.m.	CR
Undergraduate Student Speaking Contest			ASM Canada Council Suite	9 p.m. to 1 a.m.	HY	Penn State MatSE Alumni Reception	5:30 to 6:30 p.m.	CC	Thermal Spray Technology	8:30 a.m. to 5:30 p.m.	CR
Semi-Final Rounds	1 to 4 p.m.	HY	<b>Annual Meetings</b>			Alfred University Alumni Reception	6:15 to 7:30 p.m.	CC or REN	Thermodynamics Applied to Materials Science and Technology	8:30 a.m. to 5:30 p.m.	HY
Final Round	4 to 5 p.m.	HY	ACerS Annual Membership Meeting	1 to 2 p.m.	CC	ASM Awards Reception	6:30 to 7:15 p.m.	HY			
Undergraduate Student Poster Contest Display	6 to 7:30 p.m.	CC	ASM 98th Annual Meeting	4 to 5 p.m.	CC	ASM Awards Dinner	7:15 to 9:30 p.m.	HY			
Student Networking Mixer	8 to 10:30 p.m.	HY				ASM Canada Council Suite	9 p.m. to 1 a.m.	HY			
						ASM President's Reception	9:30 to 11:45 p.m.	HY			
<b>Social Functions</b>			<b>TUESDAY, OCTOBER 18</b>								
ASM Annual Meeting & Awards Dinner Rehearsal	8 to 11:30 a.m.	HY	<b>Conference Activities</b>			<b>WEDNESDAY, OCTOBER 19</b>			<b>FRIDAY, OCTOBER 21</b>		
ASM Board of Trustees Luncheon	11:30 a.m. to 12:30 p.m.	HY	Authors' Coffee	7 to 8 a.m.	CC	<b>Conference Activities</b>			<b>Educational Courses</b>		
ASM Materials Education Foundation Board of Trustees Dinner	7:30 to 10:00 p.m.	HY	Registration	7 a.m. to 6 p.m.	CC	Authors' Coffee	7 to 8 a.m.	CC	Fundamentals of Glass Science and Technology, Fractography Lab	8:30 to 11:30 a.m.	CR
			ACerS/BSD Ceramographic Display	7 a.m. to 6 p.m.	CC	Registration	7 a.m. to 5 p.m.	CC	Sintering of Ceramics	8:30 a.m. to 5 p.m.	CR
<b>Educational Courses</b>			Society Member Lounges	7 a.m. to 6 p.m.	CC	ACerS/BSD Ceramographic Display	7 a.m. to 5 p.m.	CC	Thermal Spray Technology	8:30 a.m. to 4:30 p.m.	CR
Modern Statistics, Data Analysis, and Specimen/Structural Reliability Modeling	9 a.m. to 5 p.m.	RE	ACerS Companion Breakfast	7:30 to 10 a.m.	REN	Society Member Lounges	7 a.m. to 5 p.m.	CC			
			MS&T Press Room	7:30 a.m. to 6 p.m.	CC	MS&T Press Room	7:30 a.m. to 6 p.m.	CC			
<b>MONDAY, OCTOBER 17</b>			ASM Guest Hospitality	8 to 10:30 a.m.	HY	ASM Guest Hospitality	8 to 10:30 a.m.	HY			
<b>Conference Activities</b>			General Poster Session	11 a.m. to 4 p.m.	CC	General Poster Session	10 a.m. to 4 p.m.	CC			
Authors' Coffee	7 to 8 a.m.	CC	General Poster Session with Authors	4 to 6 p.m.	CC	General Poster Session	10 a.m. to 4 p.m.	CC			
Registration	7 a.m. to 5 p.m.	CC				MS&T'11 Exhibit					
Society Member Lounges	7 a.m. to 5 p.m.	CC	<b>MS&amp;T'11 Exhibit – Exhibit Hall B3</b>			Exhibitor's Meeting & Breakfast	9 to 10 a.m.	CC			
ACerS/BSD Ceramographic Display	7 a.m. to 5 p.m.	CC	Show Hours	11 a.m. to 6 p.m.	CC	Show Hours	10 a.m. to 4 p.m.	CC			
MS&T Press Room	7:30 a.m. to 6 p.m.	CC	Professional Recruitment & Career Pavilion	11 a.m. to 6 p.m.	CC	Show Hours	10 a.m. to 4 p.m.	CC			
ASM Guest Hospitality	8 to 10:30 a.m.	HY	Football Booth	11 a.m. to 4 p.m.	CC	Professional Recruitment & Career Pavilion	10 a.m. to 4 p.m.	CC			
			Industry Presentations	11:30 a.m. to 2 p.m.	CC	Football Booth	10 a.m. to 4 p.m.	CC			
<b>Lectures</b>			MS&T Food Court	11:30 a.m. to 2 p.m.	CC	Industry Presentations	11:30 a.m. to 2 p.m.	CC			
MS&T'11 Plenary Session	8:30 a.m. to Noon	CC	Happy Hour Reception	4 to 6 p.m.	CC	MS&T Food Court	11:30 a.m. to 2 p.m.	CC			
Richard M. Fulrath Award Session	2 to 4:40 p.m.	CC				Refreshment Break	3:20 to 4 p.m.	CC			
Alfred R. Cooper Award Session	2 to 5:30 p.m.	CC	<b>Lectures</b>								
Alpha Sigma Mu Annual Meeting & Lecture	2:30 to 4 p.m.	CC	Arthur L. Friedberg Memorial Lecture	8 to 9 a.m.	CC	<b>Lectures</b>					
			TMS Young Leader Tutorial Luncheon	Noon to 2 p.m.	CC	ACerS Robert B. Sosman Lecture	1 to 2 p.m.	CC			
<b>Material Advantage Student Functions</b>			ASM Edward DeMille Campbell Memorial Lecture	12:45 to 1:45 p.m.	CC	AIST Adolf Martens Memorial Steel Lecture	1 to 2 p.m.	CC			
Undergraduate Student Poster Contest Display	7 a.m. to 5 p.m.	CC	Edward Orton, Jr. Memorial Lecture	1 to 2 p.m.	CC						
AIST Student Plant Tour – ArcelorMittal Steel	12:30 to 4 p.m.					<b>Material Advantage Student Functions</b>					
ACerS PCSA Student Tour	12:30 to 5 p.m.	Offsite				Undergraduate Student Poster Contest Display	7 a.m. to 1 p.m.	CC			
						<b>Social Functions</b>					
						ASM Tuxedo Drop-off	7 a.m. to Noon	HY			
						Drexel MSE Alumni Reception	5 to 7 p.m.	HY			

**Sunday, October 16** **5:00 – 6:00 p.m.**  
**Frontiers of Science and Society—Rustum Roy Lecture**  
 “Reinventing Manufacturing to Answer New Global Challenges and Market Opportunity,”  
**Deborah L. Wince-Smith**, President and CEO of the Council on Competitiveness

**Monday, October 17** **8:30 a.m. – Noon**  
**Plenary Session**  
**Subra Suresh**, Director of the U.S. National Science Foundation, will discuss the importance of the U.S.’s science and technology work force, followed by **Carl E. Wieman**, Associate Director for Science, Office of Science and Technology Policy, The White House and **Jeffrey Wadsworth**, President and Chief Executive Officer, Battelle Memorial Institute who will speak on related topics.

**2:00 – 5:20 p.m.**  
**ACerS Cooper Award Session on Glass Relaxation**  
 “The Physics of Iso-Structural Viscosity,” **Prabhat Gupta**, The Ohio State University  
 “Relaxation of Density Fluctuations in Glass,” **John C. Mauro**, Corning Incorporated  
 “Automatic and Robust TNM Model Parameter Estimation from Multi-rate DSC Data,” **Robert G. Erdmann**, University of Arizona

“Investigation of Dynamic Processes in Chalcogenide Glasses by Modulated DSC,” **Pierre Lucas**, University of Arizona

**2:00 – 4:40 p.m.**  
**ACerS Richard M. Fulrath Award Session**  
 - Japanese Academic: Junichi Tatami, Yokohama National University  
 - Japanese Industrial: Eiichi Koga, Panasonic Electronic Devices Co., Ltd.  
 - American Industrial: Sujanto Widjaja, Corning Incorporated  
 - Japanese Industrial: Atsushi Omote, Panasonic Corporation  
 - American Academic: Roger Narayan, Univ. of North Carolina and North Carolina State University

**3:00 – 4:00 p.m.**  
**Alpha Sigma Mu Lecture**  
 “Technical Challenges of Commercial Aircraft Wheels and Brakes,” **Charles A. Parker**, Manager Program Engineering, Honeywell Aerospace

**Tuesday, October 18** **8:00 – 9:00 a.m.**  
**ACerS Arthur L. Friedberg Memorial Lecture**  
 “Processing Dielectric Oxides—New Opportunities and Challenges,” **Clive A. Randall**, The Pennsylvania State University

**Noon – 2:00 p.m.**  
**TMS Young Leaders Lecture**

**12:45 – 1:45 p.m.**  
**ASM Edward DeMille Campbell Memorial Lecture**  
 “The Roles of Determinism and Noise in Dendritic Growth,” **Martin Glicksman**, Florida Institute of Technology

**1:00 – 2:00 p.m.**  
**ACerS Edward Orton Jr. Memorial Lecture**  
 “Lessons Learned After 40 Years of Sintering Technical Ceramics,” **Gary Messing**, The Pennsylvania State University

**Wednesday, October 19** **1:00 – 2:00 p.m.**  
**ACerS Robert B. Sosman Lecture**  
 “Interface Structure Dependent Microstructural Evolution in Ceramics,” **Suk-Joong L. Kang**, KAIST

**1:00 – 2:00 p.m.**  
**AIST Adolf Martens Memorial Steel Lecture**  
 “A Metallurgical Perspective of the Role of Rail Steel in the Growth of America,” **Bruce Bramfitt**, ArcelorMittal Steelton

## Special Events

**Sunday, October 16, 2011**  
**Welcome Reception**  
 Network with your colleagues, meet new people and learn about the exciting membership offerings of the organizing societies.

**Monday, October 17, 2011**  
**ACerS 113th Annual Meeting**  
 Newly elected officers take their positions and the Annual Membership Meeting is held. All ACerS members and guests are welcome.

**ASM Leadership Awards Luncheon**  
 ASM’s organizational unit awards as well as ASM Materials Education Foundation awards and scholarships will be presented. Incoming Committee/Council chairs will also be recognized. ASM Committee and Council members meeting during MS&T, and awardees, will receive an invitation to attend. Others may purchase tickets via the conference registration form.

**The ASM 98th Annual Meeting**  
 Attend our annual meeting where officers will be elected for the 2011-2012 term and other ASM business will be transacted. ASM members and guests are welcome.

**Women in Materials Science and Engineering Reception**  
 Enjoy the chance to network with professionals and peers in a relaxed environment.

**ACerS Annual Honors and Awards Banquet**  
 Enjoy dinner, conversation and the presentation of Society awards. Purchase tickets for \$80 via the registration form.

**Tuesday, October 18, 2011**  
**ASM Awards Dinner**  
 Join us in celebrating the technical accomplishments of this year’s award recipients and the 2011 Class of Fellows. Tickets, which include the President’s Reception following the dinner, may be purchased via the registration form.

**MS&T Young Professionals Reception**  
 Attend this reception to meet and network with fellow young professionals.

**Wednesday, October 19, 2011**  
**ASM Canada Council Suite**  
 Experience Canadian hospitality! For more information about ASM, visit [www.asminternational.org](http://www.asminternational.org).

**MS&T’11 Student Chapter Travel Grants**  
 The Material Advantage Student Program offers \$500 travel grants to student chapters in support of attending AISTech, the TMS annual meeting, or the ACerS and ASM annual meetings held at MS&T.

The student chapter may determine how the grant is spent, either to cover students’ hotel costs, or to cover 1 or 2 students traveling from afar. The grants are restricted to one grant per chapter per academic year. All grants are issued in check form to the chapter advisor, and will be sent after the event upon verification that the chapter was in attendance. If a chapter has special circumstances that require the checks to be issued prior to the meeting, exceptions can be made on a case-by-case basis. Travel grants will be awarded on a first come, first served basis, so act early!

Chapters must be active and in good standing to be eligible for a travel grant. For more information, contact Candace Cunningham at [students@asminternational.org](mailto:students@asminternational.org), or at 1-800-336-5152, ext. 5527.

**Deadline for travel grant applications is October 3, 2011.**

**Student Monitors**  
 Students may partially defray expenses by serving as session monitors. Monitors assist session chairs, record session attendance statistics, assist with audio/visual equipment, etc. Monitor positions are limited and are assigned on a first come, first served basis. Interested students should contact Marla Boots at [mboots@tms.org](mailto:mboots@tms.org).

**Undergraduate Poster Contest**  
 Stop by the Greater Columbus Convention Center to view all the submissions to the 2011 undergraduate poster contest. The posters will be displayed from Sunday, October 16, to Wednesday, October 19. For more information about this poster contest for undergraduates or to enter a poster abstract, contact Dr. Ed Sabolsky at [ed.sabolsky@mail.wvu.edu](mailto:ed.sabolsky@mail.wvu.edu). **Deadline for poster abstracts is September 23, 2011.**

**Professional Recruitment & Career Pavilion**  
 Stop by the Professional Recruitment & Career Pavilion in the expo hall on Tuesday, October 18, and Wednesday, October 19, during regular expo hall hours. Visit booths, talk to company reps and view job postings in the Career Pavilion while you explore the exhibit hall. This is your chance to make valuable contacts with potential employers. Admission to the Career Pavilion is included in your conference registration fee.

**Sunday, October 16**  
**Chapter Leadership Workshop** (Date and Time Subject to Change)  
 Network and share best practices. This workshop provides a detailed introduction to the Material Advantage Student Program for chapter officers. Registration is required for this workshop as well as MS&T conference registration. This workshop is for Material Advantage Chapter Officers only. Contact Candace Cunningham at [students@asminternational.org](mailto:students@asminternational.org) for more information.

**Undergraduate Student Speaking Contest**  
 MS&T hosts the national semifinal and final rounds of the Material Advantage Undergraduate Student Speaking Contest, organized by the Ceramic Educational Council. Each Material Advantage Chapter is encouraged to hold local contests on campus prior to MS&T. Local contest winners will advance to the semifinal/final rounds. The presentation subject must be technical but can relate to any aspect of materials science and engineering. Each contestant will receive a \$200-\$300 travel allowance to MS&T. The exact amount of the allowance depends on the number of entrants and total funds budgeted for the contest. Winners of the finals receive cash prizes. For contest rules, contact Tricia Nicol at [tricol@ceramics.org](mailto:tricol@ceramics.org). National contestants must be reported to Dr. Kristen Brosnan at [brosnan@ge.com](mailto:brosnan@ge.com) by **September 23, 2011**.

**Career Forum**  
 Discuss career options with professionals in industry, academia, and government. Get insight into the value of professional memberships, make industry connections, and learn about career opportunities from those with experience.

**Graduate School Information**  
 Students interested in graduate school will benefit from discussing pros and cons with graduate students at this session. Hear directly from university representatives about the process for applying to, and selecting a graduate school program.

**Art of Networking**  
 Improve your networking skills and learn how to meet and talk with people who may be able to impact your future!

**Student Networking Mixer**  
 Join in this relaxed, casual, and fun atmosphere designed for students, Material Advantage Faculty Advisors, and society volunteer leaders. Students are encouraged to wear their school colors. Music will be provided.

**Monday, October 17**  
**ACerS Student Tour** (Time and location to be determined)  
 Students have the opportunity to attend a tour, organized by ACerS President’s Council of Student Advisors (PCSA). Bus transportation will be provided to and from the tour. Space is limited. Stay tuned for more information in the near future. Contact Whitney Epperson at [wsepperson@gmail.com](mailto:wsepperson@gmail.com) for more information.

**AIST Student Plant Tour 12:30 pm – 4:00 p.m.**  
 Take advantage of this great opportunity to see a steel mill in action. Whether you are already interested in steel, or would like to learn about the industry, sign up for this tour. Contact Chris McKelvey for more information and to register at [cmckelvey@aist.org](mailto:cmckelvey@aist.org).

**AIST Steel Industry Student Recruiting Reception 7:00 p.m. – 9:00 p.m.**  
 Students are invited to meet and talk with representatives from the steel industry about the high technology required in today’s steel industry. Find out what great career opportunities are available. Be sure to bring your resume for internships and job leads. RSVP to Chris McKelvey at [cmckelvey@aist.org](mailto:cmckelvey@aist.org).

**Tuesday, October 18**  
**Mug Drop Contest**  
 Mugs fabricated by students from ceramic raw materials are judged on aesthetics and breaking thresholds. Mugs are dropped from varying levels until the breaking threshold is reached. The mug with the highest successful drop distance wins! To compete, **register no later than October 7, 2011** by contacting Dr. Greg Hilmas at [ghilmas@mst.edu](mailto:ghilmas@mst.edu).

**Putter Contest**  
 Teams of four students compete using putters and balls they fabricated. Each team member must have his or her own putter and ball, which are judged prior to the contest. Prizes are awarded on aesthetics, closest putt, and best putting team (the team achieving the shortest combined distance from the hole). To register your team of four, contact Dr. Greg Hilmas at [ghilmas@mst.edu](mailto:ghilmas@mst.edu) **no later than October 7**.

**Student Awards Ceremony**  
 Congratulate the winners of this year’s contests: Material Advantage Chapters of Excellence, Student Speaking Contest, Graduate and Undergraduate Poster Contests, Mug Drop Contest, Putter Contest, TMS Superalloys Awards, ASM Materials Design Competition, AIST/AISI Scholarships, and Keramos National Chapter Awards.

## Why Exhibit at MS&T?

### Unique Forum – Gain access to thousands of materials professionals!

As an exhibitor, you benefit from more than 3,000 attendees interested in products related to the structure, properties, processing and performance of materials. MS&T'11 covers the latest advancements in the breadth of materials science. Sign up to exhibit today!

### Influential Attendees – 3 out of 4 attendees have significant purchasing influence!

This audience is knowledgeable, savvy and in a position to buy. What better way to find out the latest technical needs of prospective customers than by talking directly with more than 3,000 people involved in the materials science profession? This event offers you the best way to reach key decision makers.

MS&T attendees are interested in these technologies, services and equipment areas:

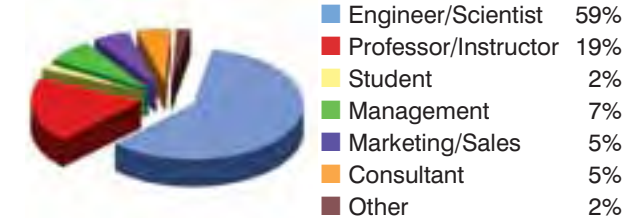
- Ceramic Processing Equipment
- Ceramics
- Commercial Materials Testing/Characterization Services
- Electronic Materials
- Engineering Applications and Related Interests
- Glass Manufacturing/Melting/Processing
- Heat Treating Equipment and Services
- Machining and Metal Cutting Equipment
- Materials Testing/Characterization Equipment and Supplies
- Metal Forming Equipment
- Metal and Alloys
- Processes
- Publications (Books, Journals, etc.)
- Refractories/Furnace Insulation
- Surface Engineering
- Vacuum Equipment-Gauges
- Welding and Joining Equipment

## MS&T Attendees are your Customers

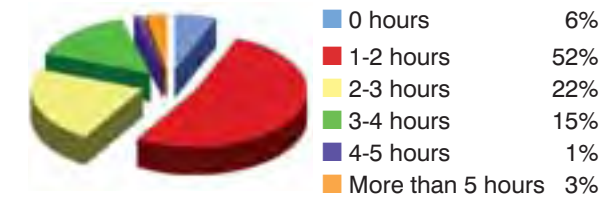
Over 85% have purchasing influence.



They perform varied jobs in the materials field.



Almost 95% of attendees spend more than one hour at the exhibition.



## Exhibit Dates and Hours:

**Tuesday, October 18, 11:00 a.m. – 6:00 p.m.**

Posters on Display: 11:00 a.m. – 6:00 p.m.  
 Lunch on the Show Floor: 11:30 a.m. – 2:00 p.m.  
 Happy Hour Reception: 4:00 p.m. – 6:00 p.m.

**Wednesday, October 19, 10:00 a.m. – 4:00 p.m.**

Poster Session: 10:00 a.m. – 4:00 p.m.  
 Lunch on the Show Floor: 11:30 a.m. – 2:00 p.m.  
 Refreshment Break: 3:20 p.m. – 4:00 p.m.

## Rental Rate of \$2,850 Includes:

- 10' x 10' booth space
- Draped 8' back wall and 3' side rails
- One-line Booth ID Sign
- Attendee list following the Event
- Full Conference Registration

MS&T attracts over 3,000 people each year, and students represent 15% of all attendees. There is no better way for companies and universities to target this audience! Reserve a booth in the Professional Recruitment & Career Pavilion to gain premier access to seasoned veterans, young professionals, graduate or post-doc candidates, primed for the job market. Space is limited so don't delay!

## Past Exhibitors:

MS&T conferences attract key players in the materials science community. Below is a sampling of companies that have recently benefitted from this valuable opportunity. Don't miss out – reserve your booth space today to reach this unique audience.

- |                                      |   |                                       |                                       |
|--------------------------------------|---|---------------------------------------|---------------------------------------|
| Across International                 | CompuTherm LLC                          | JEOL USA, Inc.                        | Radiant Technologies                  |
| AdValue Technology, LLC              | Cordstrap USA                           | Keyence Corporation                   | Rigaku Americas Corporation           |
| Agilent Technologies                 | Corning Incorporated                    | Krell Institute                       | Saudi Aramco                          |
| Aldrich Material Science             | CSM Instruments                         | LAEIS GMBH                            | Scientific Forming Technologies Corp. |
| Alfa Aesar, a Johnson Matthey Co.    | Deltech, Inc.                           | LECO Corp.                            | Sente Software, Ltd.                  |
| Alfred University                    | Dialog, LLC                             | Leica Microsystems Inc.               | Sigma-Aldrich                         |
| Allied High Tech Products, Inc.      | Drexel University                       | Mager Scientific Inc.                 | Solartron Analytical                  |
| American Stress Technologies, Inc.   | EDAX, Inc.                              | Maney Publishing                      | Spectro Analytical Instruments, Inc.  |
| Ames Laboratory                      | Eirich Machines                         | MEL Chemicals                         | Springer                              |
| Analytical Reference Materials Int'l | ELSEVIER                                | Mesocoat, Inc.                        | SPS NanoCeramics, LLC                 |
| Angstrom Scientific Inc.             | Engineered Pressure Systems, Inc.       | Metal Samples Company                 | SPS Syntex Inc.                       |
| Anter Corporation                    | Evans Analytical Group                  | Metcut Research, Inc                  | SSAB                                  |
| APPLIED TEST SYSTEMS, INC.           | Evex                                    | Micromeritics Instruments Corporation | Steel Dynamics                        |
| ArcelorMittal USA                    | FEI Company                             | Microtrac                             | Stress Engineering Services, Inc.     |
| Ashland Inc.                         | Fluid Imaging Technologies              | MTI Corporation                       | Struers Inc.                          |
| ASM International                    | Freeport McMoRan Copper & Gold, Inc.    | MTI Instruments                       | Sun-Tec Corporation                   |
| Arizona State University             | Gasbarre Products, Inc. (PTX-Pentronix) | MTS Systems Corporation               | Tantaline                             |
| Avure Technologies, Inc.             | Gatan, Inc.                             | Nanovea Inc.                          | TEC                                   |
| BigC                                 | GE Global Research Center               | Netzsch Instruments North America LLC | Tescan USA                            |
| Bloom Energy                         | General Resonance, LLC                  | Netzsch Premier Technology LLC        | TevTech, LLC                          |
| Bose Corporation                     | Goodfellow Corporation                  | NIST                                  | Texas A&M University                  |
| Brook Anco Corporation               | Granta Design                           | NSL Analytical Services, Inc.         | Thermal Technology, LLC               |
| Buehler                              | H.C. Starck                             | Nucor Corporation                     | Thermcraft, Inc.                      |
| Carbolite                            | Harrop Industries, Inc.                 | Ocean Optics                          | Thermo Scientific                     |
| Carl Zeiss MicroImaging              | High Temperature Materials Laboratory   | Ohio Carbon Blank Inc.                | Thermo-Cal Software                   |
| Carl Zeiss SMT                       | Hitachi High Technologies America Inc.  | O-I                                   | Thermotech                            |
| Carpenter Technology Corp.           | Horiba Scientific                       | Oxford Instruments                    | Titanium Metals Corporation (TIMET)   |
| Centorr Vacuum Industries, Inc.      | Hysitron, Inc.                          | PANalytical                           | U.S. Department of Energy             |
| CETR                                 | IMR Test Labs                           | Photron                               | UES, Inc.                             |
| Cilas Particle Size                  | Innov-X                                 | Powder Processing and Technology      | Union Process, Inc.                   |
| Clemex Technologies Inc.             | Int'l Metallographic Contest Exhibit    | Precision Surfaces Int'l, Inc.        | Wiley                                 |
| CM Furnaces, Inc.                    | IXRF Systems, Inc.                      | Proto Manufacturing, Inc.             | Xidex Corporation                     |

## Contact one of the following representatives for more details on exhibiting, advertising or sponsorships:



Patricia Janeway  
 Phone: (614) 794-5826  
 Fax: (614) 794-5822  
 pjaneway@ceramics.org



Bill Albaugh  
 Phone: (724) 814-3010  
 Fax: (724) 814-3011  
 balbaugh@aist.org



Kelly Thomas  
 Phone: (440) 338-1733  
 Fax: (614) 349-2108  
 kelly.thomas@asminternational.org



Trudi Dunlap  
 Phone: (724) 776-9000 ext. 275  
 Fax: (724) 776-3770  
 exhibits@tms.org

**Sunday, October 16** **9 a.m. – 5 p.m.** at The Columbus Renaissance **Modern Statistics, Data Analysis, and Specimen/Structural Reliability Modeling**

Instructors: **Jeffrey T. Fong, P.E.**, National Institute of Standards & Technology and **Stephen W. Freiman**, Freiman Consulting

**Description:** This course will review key concepts in statistical data analysis; provide the fracture mechanics background and measurement protocols needed to assess the mechanical reliability of glasses and ceramics; and demonstrate the features, capabilities, and user-friendliness of the DATAPLOT code. Participants will develop the ability to use modern statistical analysis tools to analyze experimental data sets for predicting failure of brittle materials, including the ability to predict the component failure based on lab data. They will learn how to use a publically available software system without knowing the intricacies of advanced statistical calculations. Details on required lab test procedures needed to minimize experimental uncertainties will be provided. Attendees will:

- Use the theory of error propagation to estimate the confidence interval of time to failure of a class of materials with a formula to work with.
- Use a large set of example codes to learn how to deal with a student's own data sets.
- Attendees are encouraged to bring a laptop to download programs, which will be supplied by the instructors.

**Thursday, October 20** **8:30 a.m. – 5:30 p.m.** at Hyatt Regency Columbus **Achieving Your Goals Through Effective Communication**

Instructor: **Larry Wagner**

**Description:** What if you could influence others to gain support and resources, resolve inevitable conflicts with professional confidence, and give and receive important feedback that will lead to continuously improving business and building stronger business relationships? Learn the techniques of effective communication ranging from one-on-one situations to presenting information to large groups. This course is structured so that attendees can immediately begin developing these important skills through practice in small group settings. At the completion of this course, the attendee will be able to:

- Confirm perception of others' perspectives through active listening
- Provide feedback focused on achieving positive results
- Receive feedback and modify their approach to improve performance
- Understand the multiple perspectives of key decision makers and develop an effective influencing strategy
- Manage conflict using optimized approaches
- Modify their communication style depending on the technology used and target audience

**8:30 a.m. – 5:30 p.m.** at Hyatt Regency Columbus **Materials Enabled Design**

Instructor: **Michael Pfeifer**

**Description:** Step beyond the physical and mechanical properties of materials when selecting materials, and gain insight into the engineering process and considerations for optimizing the materials used in your products. Learn how to incorporate the materials engineering perspective into product design and manufacturing decisions in order to optimize the materials, enabling a product to meet its performance, reliability, and cost requirements. In this course you will learn about all the product design and manufacturing decisions that require the materials engineering

perspective as they pertain to achieving overall product success. This perspective is based on three considerations:

1. The performance, reliability, and cost of a product are highly dependent on the properties of the materials that make up the product.
2. Proper selection of the materials used in a product is crucial to satisfy its performance, reliability, and cost requirements.
3. Control of the variation of the properties of the materials that make up a product is crucial for enabling its consistent performance, reliability, and cost.

**8:30 a.m. – 5:30 p.m.** at Hyatt Regency Columbus **Microstructures 101 and Beyond**

Instructor: **Frauke Hogue**

**Description:** Do you interpret microstructures on a regular basis, for quality control, failure analysis or research? Are you just curious about what the structures mean that you have been seeing all these years or is metallography a new field for you? In any case, this class is for you! The focus is on practical interpretation, not theory, phase diagrams, and thermodynamics. There are no prerequisites. We will look at slides of over 100 microstructures and discuss what each structure tells us about the type of material, manufacturing methods used, heat treatment, mechanical properties, and sometimes even failure modes. The course is divided into several segments, including:

- Carbon and Alloy Steels (untempered martensite, retained austenite, bainite, influence of cooling rates, and heat treatment on microstructures)
- Stainless Steels (ferritic, martensitic, austenitic, duplex, and precipitation hardening stainless steel structures, sensitization, delta ferrite, wrought, and cast materials)
- Superalloys (Co-, Ni- and Fe/Ni-base alloys, wrought, cast, single phase, incipient melting)
- Evaluate the effects of manufacturing methods on the structures

**8:30 a.m. – 5:30 p.m.** at Hyatt Regency Columbus **Thermodynamics Applied to Materials Science and Technology**

Instructors: **Arthur Pelton** and **Patrice Chartrand**

**Description:** This course will provide an overview of the functionality of FactSage®. The instructors will incorporate real-time examples to demonstrate its capabilities, and draw the connection between the computational results with real-life design and process challenges. Attendees who bring their laptops to the course will receive a full-scale version of FactSage® so they can follow along and gain hands-on experience. This software will be available for three days, so attendees can continue exploring possibilities. Upon completion of this course, the attendee will be able to:

- Perform a wide variety of thermodynamic calculations, such as the calculation and manipulation of phase diagrams and the simulation of equilibria in industrial processes.
- Generate tables, graphs and figures to analyze, summarize and communicate results
- Determine which information, database, calculation and manipulation modules are necessary to meet your specific requirements

**Thursday, October 20– Friday, October 21** **8:30 a.m. – 5:30 p.m. | 8:30 – 11:30 a.m.** at Crowne Plaza **Fundamentals of Glass Science and Technology, Fractography Lab**

Instructor: **Instructor: Arun K. Varshneya**, Saxon Glass Technologies

**Description:** The course covers basic glass science and technology in

order to broaden or improve one's foundation in the understanding of glass as a material of choice. Topics include: glass science (commercial glass families, glassy state, nucleation and crystallization, phase separation, glass structure); glass technology, batch calculations; glass melting and forming; glass properties and engineering principles; and elementary fracture analysis. At the end of the course, the attendee should be able to:

- Know the various commercial oxide glass families, their nominal chemical composition, and their key properties that are important for applications
- Understand its physical relationship to liquids and solids
- Have a general idea of key physical and chemical properties that lead to common applications
- Know the basics of glass melting and forming including annealing of the more common commercial glass products

**8:30 a.m. – 5:30 p.m. | 8:30 a.m. – 5 p.m.** at Crowne Plaza **Sintering of Ceramics**

Instructor: **Mohamed N. Rahaman**, Missouri University of Science and Technology

**Description:** The course covers a review of sintering basics: characterization of sintering (methods used to measure/monitor the progress of sintering); driving forces; diffusion and defect chemistry; solid-state and viscous sintering; microstructure development and control; liquid-phase sintering; special topics: effect in homogeneities on sintering; constrained sintering of composites, adherent thin films, and multilayers; solid solutions additives (dopants); reaction sintering; viscous sintering with crystallization; sintering practice: "how to do" sintering; effect of various materials and processing parameters on sintering; and case studies. The attendee will develop sufficient background in the principles and practice of sintering to be able to:

- Do sintering to achieve specified target microstructures
- Understand the difficulties encountered in practical sintering
- Take practical steps to rectify the problems encountered in producing required target microstructures

**8:30 a.m. – 5:30 p.m. | 8:30 a.m. – 4:30 p.m.** at Crowne Plaza **Thermal Spray Technologies**

Instructor: **Christopher Berndt**

**Description:** Thermal spray technology and coatings provide "solutions" to engineers and scientists for applications that include repair, wear, high temperature and aqueous corrosion, and thermal protection. Thermal spray processes include plasma spray, twin wire arc, combustion, high velocity oxy fuel (HVOF), and cold spray. Virtually any material can be deposited as a surface coating onto a wide range of other materials. Upon completion of this course, the attendee will be able to:

- Determine the historical basis for thermal spray technology and have detailed knowledge regarding the development of equipment and materials as related to present-day technology
- Recognize the terminology, principles and underlying theory of thermal spray technology
- Compare and contrast thermal spray technologies with respect to competing coating technologies
- Explain how feedstocks are designed and manufactured and how to select them for different spray processes
- Identify applicable testing methods and currently accepted industrial practices used for quality control of coatings

## Materials Science & Technology 2011 Conference and Exhibition

October 16-20, 2011

# Tour Registration Form

**Deadline: September 26, 2011**

**Reservation Deadline**

Due to limited capacities, registrations will be accepted on a first-come, first-served basis and must be received by **Monday, September 26, 2011**. Destinations by Design LLC will charge a \$10.00 cancellation fee for all cancelled tour registrations. **Onsite registrations will not be offered.**

### Woodhaven Cooking School

**Monday, October 17th, 2011 | 9:30 a.m. – 3:15 p.m. | \$98.00**

Discover the world of culinary delights at Woodhaven Farm! The group will work together in teams to prepare the various courses of a gourmet meal. All the recipes, fresh ingredients and equipment are supplied. With instruction and guidance from a professional chef, each team will prepare one of the delicious, beautifully presented courses for the rest of the lunch guests. Then, sit down to eat the glorious feast just prepared!



Tour will depart from the Hyatt Regency Downtown Columbus from the North drop-off area on the 2nd level at 9:45 a.m. Please arrive 15 minutes before scheduled departure time for boarding. Tour departs on time. No refunds for missed tours.

### Franklin Park Conservatory

**Tuesday, October 18th, 2011 | 9:30 a.m. – 2:15 p.m. | \$41.00**

Built in 1895, Franklin Park Conservatory is a botanical landmark two miles east of downtown Columbus. It is a premier horticultural and educational institution showcasing exotic plant collections, special exhibitions, and a signature collection of work by glass artist Dale Chihuly. Set within the 88 acres of Franklin Park, the Conservatory houses 400 species of plants from a variety of global climate zones and features a Victorian Palm House with more than 40 species of palms. It is surrounded by botanical gardens and floral displays. A dynamic and multi-faceted institution, Franklin Park Conservatory is a unique and popular destination for visitors of all ages.



Tour will depart from the Hyatt Regency Downtown Columbus from the North drop off area on the 2nd level at 9:45 a.m. Please arrive 15 minutes before scheduled departure time for boarding. Tour departs on time. No refunds for missed tours. Tour will include lunch.

**Terms and Conditions:** Tours are under the guidance of Destinations by Design LLC. The tour description is representative of the tour. Destinations by Design LLC reserves the right to alter the tour and provide equitable substitution when necessary as well as cancel the tour if minimum number of registrants is not met or if an attraction becomes unavailable for reasons beyond the control of Destinations by Design LLC. Destinations by Design LLC will charge a \$10.00 cancellation fee for all cancelled tour registrations.

**Tour Participant Information (one person per form):**

Last Name \_\_\_\_\_ Middle Initial \_\_\_\_\_  
 First Name \_\_\_\_\_  
 Street Address \_\_\_\_\_  
 City \_\_\_\_\_ State/Province \_\_\_\_\_  
 Zip+4/Postal Code \_\_\_\_\_ Country \_\_\_\_\_  
 Daytime Phone \_\_\_\_\_ Fax \_\_\_\_\_  
 Cell Phone (to use onsite, if needed) \_\_\_\_\_  
 E-mail \_\_\_\_\_  
 Person to contact in case of emergency \_\_\_\_\_  
 Phone \_\_\_\_\_

**Check box if you have special needs:** Please attach a written description of your disability and/or diet-related needs to this registration form. We cannot assure the availability of appropriate accommodations without prior notification of need.

**Payment Information:** Please fax or mail this form with full payment to:

Destinations by Design LLC – Attn: Rebecca Garforth, 6000 Venture Drive, Suite D, Dublin, Ohio 43017  
 Fax: (614) 792-9070 Phone: (614) 798-9857

TOUR	DATE	TIME	Price	Total
Woodhaven Cooking School	Monday, Oct. 17	9:30 a.m. – 3:15 p.m.	\$98.00	\$
Franklin Park Conservatory	Tuesday, Oct. 18	9:30 a.m. – 2:15 p.m.	\$41.00	\$
<b>Onsite registrations will not be offered.</b>			Total Amount Due	\$

**Method of Payment:**  VISA  MasterCard  American Express  Check (Reference MS&T in memo)

Name on Card (please print) \_\_\_\_\_  
 Card Number \_\_\_\_\_ Exp. Date \_\_\_\_\_  
 Card ID Number\* \_\_\_\_\_

\*For VISA and MasterCard – the last three or four numbers on the back on the signature line

\*For American Express – printed four numbers on the front over the last four embossed numbers

Cardholder Billing Address (if different from above) \_\_\_\_\_  
 \_\_\_\_\_

Authorized Signature \_\_\_\_\_ Date \_\_\_\_\_

**Liability Waiver:** I agree and acknowledge that I am undertaking such participation in tours, events and activities of my own free will and intentional act, and I am aware that possible physical injury might occur to me as a result of my participation in these tours, events and activities. I give this acknowledgement freely and knowingly, and certify that I am, as a result, able to participate in these tours, events and activities and do hereby assume responsibility for my own well-being. I also agree not to allow any other individual to participate in my place. MS&T and Destinations by Design LLC are not liable for recovering any lost items while participating in the tour. All personal belongings are the responsibility of the individual.

### Hotel Options

Reserve your room through the Greater Columbus Convention and Visitors Bureau at one of the official conference hotels in downtown Columbus where MS&T has arranged for attendee discounted rates. Please note that MS&T has assumed a financial liability for any and all hotel rooms in blocks that are not reserved. We ask that you kindly reserve your room at one of the hotels listed below in order to limit our financial liability for the overall success of the meeting. Thank you for your cooperation!

**Hyatt** – Attached to Convention Center, ASM headquarters hotel

**Crowne Plaza** – 1 block from Convention Center, TMS & AIST headquarters hotel

**Renaissance** – 4 blocks from Convention Center, ACerS headquarters hotel

**Red Roof Inn** – 1 block from Convention Center

**Hampton Inn** – 1 block from Convention Center

**Drury Inn** – 1 block from Convention Center

**Reserve your room online at [www.matscitech.org](http://www.matscitech.org)**

### Shuttle Service

Scheduled complimentary shuttle transportation is provided by Experience Columbus and the Hospitality Community between the Renaissance Columbus Downtown Hotel and the Greater Columbus Convention Center from Sunday, October 16 – Thursday, October 20.

Shuttle service will not be provided from the Hyatt, Crowne Plaza, Red Roof Inn, Hampton Inn, or Drury Inn to the Greater Columbus Convention Center as these hotels are all within walking distance.

### Transportation

Port Columbus International Airport (CMH), located eight miles east of downtown, is served by ten airlines with more than 300 arrivals and departures daily serving 34 cities on a non-stop basis.

Additional airport information can be found at [www.FlyColumbus.com](http://www.FlyColumbus.com).

### Airport Shuttle Service

It doesn't matter if you call ahead or just walk right up, with shuttles operating every 20 minutes you can be in the heart of the city in no time. Simply follow the signage to Ground Transportation. Current shuttle fare is \$17 per person.

### Taxi Service

The average taxi fare from the Port Columbus International Airport to downtown Columbus is \$25.

### Driving Directions to the Greater Columbus Convention Center

The Greater Columbus Convention Center is located in the heart of downtown Columbus at 400 North High Street. Visit [www.matscitech.org](http://www.matscitech.org) for detailed driving directions to the Center and parking locations.



## Official Housing Form

**Reservation Deadline: September 23, 2011**

**Instructions:** Submit one form for each room requested. For best availability and immediate confirmation, make your reservation online. Confirmation for other reservations may take up to 10 days. No reservations by phone.

**Web:** [www.matscitech.org](http://www.matscitech.org) **Fax:** (614) 222-6140

**Mail:** MS&T Housing c/o Experience Columbus; 277 W. Nationwide Blvd., Suite 125 Columbus, OH 43215

### Guest Information

Arrival Date \_\_\_\_\_ Departure Date \_\_\_\_\_

Surname \_\_\_\_\_

First Name \_\_\_\_\_ Middle Initial \_\_\_\_\_

E-mail Address (to receive confirmation) \_\_\_\_\_

Daytime Phone \_\_\_\_\_ Fax \_\_\_\_\_

Company \_\_\_\_\_

Street Address or P.O. Box \_\_\_\_\_

City \_\_\_\_\_ State/Province \_\_\_\_\_

Zip+4/Postal Code \_\_\_\_\_ Country \_\_\_\_\_

**Hotel Selection:** Indicate 1st, 2nd and 3rd choice and circle applicable rate.

	Single 1 bed/1 pers	Double 1 bed/2 ppl	Triple 2 beds/3 ppl	Quad 2 beds/4 ppl	Govt. Rate*
___ <b>Hyatt</b> *	\$177	\$187	\$197	\$207	\$94
___ <b>Renaissance</b> *	\$168	\$168	\$168	\$168	\$94
___ <b>Crowne Plaza</b> *	\$177	\$177	\$187	\$187	\$94
___ <b>Drury Inn</b>	\$152	\$152	\$162	\$162	\$94
___ <b>Drury Suites</b>	\$172	\$172	\$182	\$182	\$94
___ <b>Hampton Inn</b>	\$162	\$172	\$172	\$172	\$94
___ <b>Red Roof</b>	\$136	\$136	\$136	\$136	\$94

**Notes:** Rooms are 16.75% tax rate.

\*Government rooms are extremely limited; proof of federal government employment must be shown at check-in or higher rate will be charged. Government rate is the prevailing government rate and subject to change.

\* ASM HQ hotel \* ACerS HQ hotel ♦ TMS & AIST HQ hotels

**List all room occupants including yourself (maximum of four);**

1. \_\_\_\_\_ 3. \_\_\_\_\_

2. \_\_\_\_\_ 4. \_\_\_\_\_

**Check here if you have a disability requiring special services:** \_\_\_\_\_

**For reservations at Drury Inn and Suites or Hampton Inn, please indicate:**

Nonsmoking  Smoking  No Preference

Other hotels are smoke-free.

### Deposit

Reservation requests must be accompanied by credit card information to guarantee the reservation.

Forms received without valid credit card information will not be processed.

At the earliest, your credit card will not be charged the first night's deposit until September 23, 2011.

American Express  MasterCard  VISA  Discover  Diners Club

Card # \_\_\_\_\_ Exp. Date \_\_\_\_\_

Cardholder Name (please print) \_\_\_\_\_

Signature \_\_\_\_\_

Cardholder Billing Address \_\_\_\_\_

City \_\_\_\_\_ State/Province \_\_\_\_\_

Zip+4/Postal Code \_\_\_\_\_ Country \_\_\_\_\_

**Need to check, change or cancel reservation?** E-mail [housing@experiencecolumbus.com](mailto:housing@experiencecolumbus.com), or visit [www.matscitech.org](http://www.matscitech.org), through 10/6/11. After that date, contact hotel directly.

**Have questions?** E-mail [housing@experiencecolumbus.com](mailto:housing@experiencecolumbus.com) through 10/6/11.

**Cancellation Policy:** Reservations cancelled less than 72 hours prior to noon of scheduled arrival date will be charged one night rate and tax. Fax: (614) 222-6140

**Register before September 23, 2011 to save up to \$175.**

### What your MS&T Full Registration Includes:

- Welcome Reception (Sunday)
- MS&T Technical Sessions (Monday – Thursday)
- MS&T Proceedings CD-ROM
- MS&T Exhibition & Poster Session
- Exhibit Hall Happy Hour Reception (Tuesday PM)
- Tuesday Student Lunch Ticket (Students Only)
- Wednesday Lunch Ticket (Full Attendees)
- Exhibition Contests and Activities
- Complimentary Memberships in ACerS, AIST, ASM, TMS (for non-members only)

### Three ways to register:

- Online at [www.matscitech.org](http://www.matscitech.org)
- Mail the enclosed registration form with payment
- Fax the enclosed registration form with credit card information

*Registration cannot be processed without full payment. Advance registrants will receive an email confirmation when their registration is processed.*

### Badge Pick-up and On-site Conference Registration

The MS&T Conference registration desk will be located on the 1st level of the Greater Columbus Convention Center. Advance registrants may pick-up badges at the registration area during the following hours:

Sunday, October 16	2 p.m. to 7:30 p.m.
Monday, October 17	7 a.m. to 5 p.m.
Tuesday, October 18	7 a.m. to 6 p.m.
Wednesday, October 19	7 a.m. to 5 p.m.
Thursday, October 20	7 a.m. to 2 p.m.

*For quick and easy onsite registration, remember to bring a print out of your registration confirmation with bar code identification!*

### Cancellation Policy

Cancellation Policy: Registration fees, less a \$50 service fee, will be refunded after the close of the event if a written request is received on or before September 23.

After September 23, no refund requests will be granted. Send all written requests to MS&T, c/o Registration Control Systems; 1833 Portola Rd., Suite D, Ventura, California 93003.

### Americans with Disabilities:

In accordance with the American with Disabilities ACT (ADA) of 1990, ACerS, AIST, ASM, TMS, the Greater Columbus Convention Center and all conference hotels are striving to accommodate all guests with special needs. If you require access to modified housing, transportation, or other assistance, please provide this information in detail on both your conference registration and housing forms.

### Audio and Visual Recording of Technical Paper Presentations/ Sessions:

ACerS, AIST, ASM and TMS reserve the right to any still photography, audio and video reproductions of presentations at every technical session. Recording of sessions (audio, video, still photography, etc.) intended for personal use, distribution, publication, or copyright without the express written consent of MS&T and the individual authors is strictly prohibited.

MS&T plans to take photographs and video at MS&T Conference and exposition and reproduce them in MS&T educational, news or promotional material, whether in print, electronic or other media, including the MS&T website. By participating in the MS&T Conference and Exposition, you grant MS&T the right to use your name, photograph and biography for such purposes. All postings become the property of MS&T. Postings may be displayed, distributed or used by MS&T for any purpose.



# Registration Form

**Advance Deadline:  
September 23, 2011**

**Register online at [www.matscitech.org](http://www.matscitech.org)**

**If you are unable to register online, please mail or fax this form to:**  
 MS&T, c/o Registration Control Systems; 1833 Portola Rd., Suite B, Ventura, California 93003  
**Phone:** (805) 677-4297 **Fax:** (805) 654-1676 **Email:** [mst2011@rcsreg.com](mailto:mst2011@rcsreg.com)

**1. CONTACT INFORMATION (Please print or type.)**

Member ID# \_\_\_\_\_  ACerS  AIST  ASM  NACE  TMS  Material Advantage

Mr.  Ms.  Mrs.  Dr.  Prof.  Business Address  Home Address

Surname \_\_\_\_\_ First Name \_\_\_\_\_ Middle Initial \_\_\_\_\_

Job Title \_\_\_\_\_

Company/School \_\_\_\_\_

Street Address or P.O. Box \_\_\_\_\_

Dept./M.S. \_\_\_\_\_

City \_\_\_\_\_ State/Province \_\_\_\_\_

Zip+4/Postal Code \_\_\_\_\_ Country \_\_\_\_\_

Phone \_\_\_\_\_ Fax \_\_\_\_\_

E-mail \_\_\_\_\_

Person to contact in case of emergency \_\_\_\_\_ Phone \_\_\_\_\_

Special Requirements \_\_\_\_\_

2. REGISTRATION	ADVANCE FEES on or before 09/23/11	ON-SITE FEES After 09/23/11
<b>Full Conference</b>		
<input type="checkbox"/> Member	<input type="checkbox"/> \$575	\$675
<input type="checkbox"/> Nonmember	<input type="checkbox"/> \$725 <sup>1</sup>	\$850 <sup>1</sup>
<b>Participant</b>		
<input type="checkbox"/> Participant (Speaker, Organizer, Session Chair) Member	<input type="checkbox"/> \$525	\$625
<input type="checkbox"/> Participant (Speaker, Organizer, Session Chair) Nonmember	<input type="checkbox"/> \$675 <sup>1</sup>	\$800 <sup>1</sup>
<b>Student</b>		
<input type="checkbox"/> Student Member	<input type="checkbox"/> \$75 <sup>2,4</sup>	\$100 <sup>2,4</sup>
<input type="checkbox"/> Student Nonmember	<input type="checkbox"/> \$100 <sup>2,3</sup>	\$125 <sup>2,3</sup>
<input type="checkbox"/> Student Participant (Speaker, Organizer, Session Chair) Member	<input type="checkbox"/> \$50 <sup>2,4</sup>	\$75 <sup>2,4</sup>
<input type="checkbox"/> Student Participant (Speaker, Organizer, Session Chair) Nonmember	<input type="checkbox"/> \$75 <sup>2,3</sup>	\$100 <sup>2,3</sup>
<b>1-Day</b>		
<input type="checkbox"/> Member	<input type="checkbox"/> \$425	\$600
<input type="checkbox"/> Nonmember (Day Attending) _____	<input type="checkbox"/> \$575 <sup>1</sup>	\$800 <sup>1</sup>
<input type="checkbox"/> MS&T Exhibit Only	<input type="checkbox"/> \$25	\$25
<b>Registration Total \$</b>		

<sup>1</sup> Nonmember fee includes a complimentary one-year membership to registrant's choice of one or more organizations: ACerS, AIST, ASM, and TMS.  
<sup>2</sup> To qualify for the student rate, registrant must provide student I.D.  
<sup>3</sup> Nonmember student fee includes a complimentary one-year membership in Material Advantage (ACerS/AIST/ASM/TMS joint student program).  
<sup>4</sup> Rate applies to Material Advantage and NACE student members.

**3. COMPLIMENTARY MEMBERSHIPS**

Nonmember registrants should select the organization(s) to which they would like to receive complimentary one-year membership:  
 ACerS  AIST  ASM  TMS (NOTE: Nonmember students receive complimentary membership in Material Advantage.)

**4. LUNCHEONS, SOCIAL FUNCTIONS AND WORKSHOPS**

ASM International Leadership Awards Luncheon (Monday, October 17)	\$35 x _____ tickets = \$ _____
The American Ceramic Society Awards Banquet (Monday, October 17)	\$80 x _____ tickets = \$ _____
TMS Young Leader Tutorial Lecture [Box Lunch] (Tuesday, October 18)	\$25 x _____ tickets = \$ _____
ASM International Awards Banquet (Tuesday, October 18)	\$80 x _____ tickets = \$ _____
Prof. Krishan K. Chawla Honorary Symposium Dinner (Wednesday, October 19)	\$65 x _____ tickets = \$ _____
<b>Luncheon/Social Functions Total \$</b> _____	

**5. SHORT COURSES**

	Member		Nonmember		Student	
	Early	Onsite	Early	Onsite	Early	Onsite
<b>Modern Statistics, Data Analysis, and Specimen/Structural Reliability Modeling</b> Sunday, October 16   9 a.m.–5 p.m.	\$495	\$620	\$585	\$710	\$175	\$250
<b>Achieving Your Goals through Effective Communication</b> Thursday, October 20   8:30 a.m.–5:30 p.m.	\$579	\$679	\$699	\$799	\$229	\$329
<b>Materials Enabled Design</b> Thursday, October 20   8:30 a.m.–5:30 p.m.	\$579	\$679	\$699	\$799	\$229	\$329
<b>Microstructures 101 and Beyond</b> Thursday, October 20   8:30 a.m.–5:30 p.m.	\$579	\$679	\$699	\$799	\$229	\$329
<b>Thermodynamics Applied to Materials Science and Technology</b> Thursday, October 20   8:30 a.m.–5:30 p.m.	\$579	\$679	\$699	\$799	\$229	\$329
<b>Fundamentals of Glass Science and Technology and Fractography Lab</b> Thursday, October 20 – Friday, October 21   8:30 a.m.–5:30 p.m. and 8:30–11:30 a.m.	\$695	\$820	\$785	\$910	\$275	\$350
<b>Sintering of Ceramics</b> Thursday, October 20 – Friday, October 21   8:30 a.m.–5:30 p.m. and 8:30 a.m.–5 p.m.	\$695	\$820	\$785	\$910	\$275	\$350
<b>Thermal Spray Technology</b> Thursday, October 20 – Friday, October 21   8:30 a.m.–5:30 p.m. and 8:30 a.m.–4:30 p.m.	\$695	\$820	\$785	\$910	\$275	\$350
<b>Short Course Total \$</b> _____						

**6. PROCEEDINGS (Full conference and participant registrants receive a copy of the Proceedings on CD.)**

Additional attendee copies of MS&T'11 Proceedings on CD	\$195 x _____ copies = \$ _____
Additional student copies of MS&T'11 Proceedings on CD	\$75 x _____ copies = \$ _____
<b>Proceedings Total \$</b> _____	

**7. RENEW SOCIETY MEMBERSHIP**

If you are currently a member, or your membership has expired, renew your membership here.  
 ACerS–\$120  AIST–\$100  ASM–\$103  TMS–\$115  Material Advantage–\$25

**Membership Renewal Total \$** \_\_\_\_\_

**8. STUDENT REGISTRATION INFORMATION**

Degree Pursuing: \_\_\_\_\_

Anticipated Graduation Date: \_\_\_\_\_

**9. METHOD OF PAYMENT (All payments must be in U.S. dollars.) Registrations will only be processed with full payment.**

Check enclosed Check # \_\_\_\_\_ (Make check payable to MS&T.)  
 MasterCard  VISA  American Express  Discover

**Grand Total \$** \_\_\_\_\_

Cardholder Name \_\_\_\_\_

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**Cancellation Policy:** Registration fees will be refunded after the close of the event if a written request is received on or before September 23 less a \$50 service fee. After September 23, no refund requests will be granted. Send all written requests to MS&T, c/o Registration Control Systems; 1833 Portola Rd., Suite B, Ventura, California 93003. *MS&T management reserves the right to amend this program as necessary.*

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