

# Central Massachusetts Chapter Newsletter



ASM International Central Massachusetts Chapter, [www.asm-ma.org](http://www.asm-ma.org)

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## In this Issue

Welcome to Our 2017-2018 Season!.....	1
2017-2018 Meeting Schedule .....	1
Announcing Our Autumn Course .....	2
2017 ASM New England Materials Experience.....	3
Central Mass Chapter ASM Golf Outing.....	4
Sustaining Member Company Benefits.....	4
WPI Faculty News.....	5
WPI Student News.....	6
Chet Inman Award and MQP Awards for WPI .....	6
Articles & Contact Us .....	7

## A special thanks to our Sustaining Member companies:

Babcock Power  
Bodycote  
Buehler  
Country Heat Treat  
Dexter-Russell Inc.  
Excel Technologies Inc.  
Exponent  
Hardline Heat Treating  
Hayden Corporation  
IPG Photonics  
MetLab Inc.  
MMR Group Incorporated  
Precision Wire Shapes Inc.  
United Service Company  
Worcester Polytechnic Institute

## Welcome to Our 2017-2018 Season!

I would like to welcome everyone to the 96th season of the Central Massachusetts Chapter of ASM International.

I look forward to building on the success of previous years. Our chapter we will work continuously towards providing an environment that will retain existing and attract new members while providing a path for learning and sharing information.

Welcome everyone to the 96th season of the Central Massachusetts Chapter of ASM International. The first event of this season was informative and exciting with our visit to the Jack's Abby Brewery. Each event is spouse and guest nights. The remainder of the year, there will be exciting meetings with interesting topics in Materials Science and Engineering, including joint meetings with Boston and Rhode Island Chapters, Trustee meeting, WPI student MQP presentations night, 2018 New England Materials Experience at WPI, our annual golf outing, and presentations on Additive Manufacturing technology.

The Central Mass Chapter of ASM International committee consists of both young professionals and experts with long experience in the Materials field who are eager to share their passion with the next generation of students.

Thank you for your support of the Central Massachusetts Chapter of ASM international.

Tasos Gavras  
2017-2018 Chapter Chair  
Central Massachusetts Chapter – ASM International

## 2017-2018 Meeting Schedule

DATE	TOPIC	SPEAKER	FORMAT	LOCATION
Sept. 20	Jack's Abby Brewery Tour	Brewery Staff	Spouses and Guest Night	Jack's Abby Brewery, 100 Clinton St, Framingham, MA 01702
Oct. 18 (cancelled)	Heat Treating Round Table	Bob Chalue, Hardline HT Dave Soderberg, County HT Bob Emerson, RI HT	Panel Discussion	Dino's Restaurant, 13 Lord St, Worcester, MA
Nov. 15	Metal Additive Manufacturing	Dr. Rainer Hebert	Presentation	Dino's Restaurant, 13 Lord St, Worcester, MA
Jan. 24, 2018	Oxford Instruments	TBD	Joint Meeting with ASM-Boston	300 Baker Avenue Extension #150, Concord, MA 01742
Feb. 15	Emergency Preparation	Army Corps of Engineers	Joint Meeting with ASM-RI	Village Heaven Restaurant, Forestdale RI
March	ASM Trustee Speaker	TBD	TBD	Dino's Restaurant, 13 Lord St, Worcester, MA
April 25	WPI Undergraduate Major Qualifying Project Poster & Presentation Competition	Top 3 finalist teams	Student Night & Past Chair's Night	O'Connor's Worcester MA
May 2	Elevator Pitch Night	Various	Elevator Pitch	TBD
May	Annual Golf Outing	2018 Outing	Election of Officers, Golf and Barbecue	Heritage Golf Club Charlton, MA



## Failure Analysis

The Central Massachusetts Chapter of ASM International, in conjunction with ASM Education, is pleased to offer *Failure Analysis* in spring, 2018. More information to come. Please check out website for updates.

# 2017 ASM New England Materials Experience

This year was the 12<sup>th</sup> annual New England Materials Experience at WPI and the 6<sup>th</sup> annual at Boston University. These events are jointly sponsored and organized by the Central Massachusetts, Boston, Rhode Island and Northern New England Chapters of ASM. Students, teachers and parents enjoyed learning about many facets of the world of Materials Science & Engineering. Students learned about selecting materials to design a bicycle helmet using chocolate to simulate the brain during impact. They learned about fatigue and fracture, how materials are tested with Instron, and hand made metal bowls with a hammer and metal sheets. They also learned how to turn bananas into hammers with liquid nitrogen, and casted their own aluminum parts.

The WPI Materials Experience took place on Monday, May 8th with students from several different high schools. Students began the day with a welcome speech from Professor Richard Sisson. He introduced the students to how materials impact their lives every day. The day closed with a talk by Professor Brajendra Mishra.

The students were divided into eight groups to attend each of the different modules, including cryogenics, metal shaping, musical materials, electrochemistry, casting, mechanical behavior, Instron testing, and fatigue. At each of these stations, students were able to experience a different aspect of materials science ranging from experiments like smashing cryogenically frozen flowers and racquet balls to how material science can help prevent catastrophic failures. Over lunch students were able to talk with graduate student, professors, and professionals from the Materials World.



Students at check in



Students learning about casting



Students learning about materials selection for impact resistance



Opening speech from Professor Richard Sisson



Students learning about electrochemistry with lemons and potatoes



Students learning about liquid nitrogen



Students trying metal shaping with Fay



Students learning about musical materials



Students learning about atomic arrangements in metals and their influence on mechanical properties



Instron testing

# Central Mass Chapter ASM Golf Outing

For as long as we can remember, the Worcester Chapter has had a golf outing that at first was very well attended. As time changed the attendance dwindled to only a few golfers. In 1993, Frank Blanchard made a suggestion to the executive committee to go from just a social get together, to a competition involving local and out of state companies. This was our twenty fourth year for this outing. The results is that we now have seventy or more golfers competing on the course to win the right to have their right to have their company's name placed on the Worcester ASM Golf Outing Plaque with all the other past winners.

Through the years we have been able to keep our entree fee very low, yet offer a great steak dinner and terrific target holes along with other competitive challenges like the LosVegas Hole. A nice touch to the outing is the free beer and hot dog for lunch.

We like to give a special thank you to Eric Tessier from Gallant Machine in Worcester, MA for all the help he has given through the years. . Also a big thank you to John Elder, Kathy Trudeau for all their effort in the success of this outing .We would also like to thank all the companies who sponsored a tee sign and especially to Noah Budiansky and Exponent for their generous donation Pro V1 golf balls and all who have participated in this year's outing.

We look forward to seeing you on May 24, 2018 at our next outing.

The winning team in 2017 was United Service Hardline Heat treating with the following players.

**1st Place Winners**

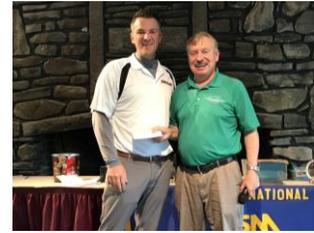
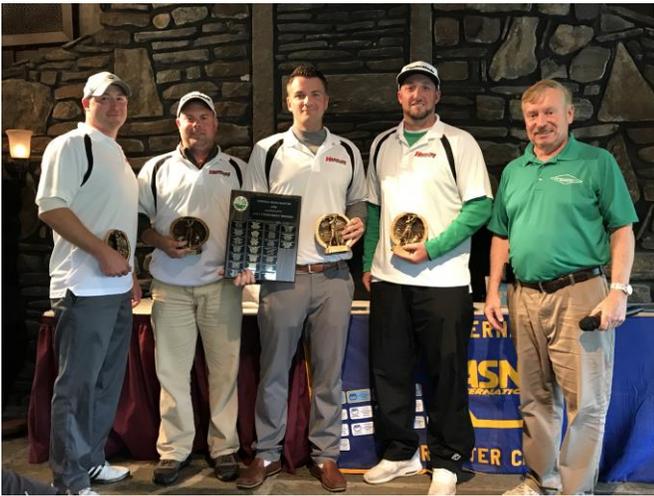
Chad Ford \* Chris O'Connor  
Brandon Houlihan \* Josh Fasshauer

**Longest Drive**

Brandon Houlihan

**Closest To The Pin**

Terry Crockett



## Sustaining Member Company Benefits

ASM Worcester offers a unique opportunity for local companies in the materials industry to benefit from corporate membership. These benefits include:

- Membership for one individual (since Sustaining Membership is only \$175 annually, this decreases the individual's membership cost from \$113 to \$62).
- Discounted price for employees to attend local ASM courses held by the Worcester Chapter.
- A link from our website ([www.asm-ma.org](http://www.asm-ma.org)) to your company website.
- Recognition on our website of your company as a supporting Sustaining Member.
- Recognition of your company as a sponsoring Sustaining Member at the beginning of each monthly meeting's technical presentation.

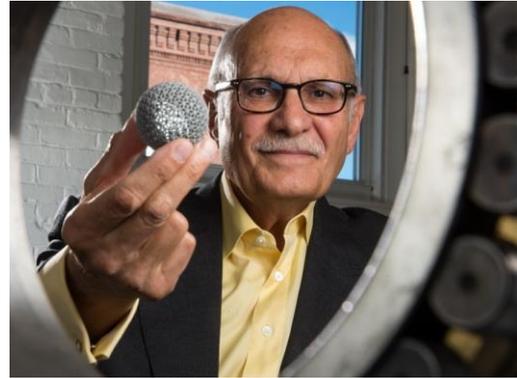
Are there benefits that you would like that aren't listed? Please contact us with your suggestions at [asmworc@asm-ma.org](mailto:asmworc@asm-ma.org).

Our goal is to increase how Sustaining Memberships in ASM Worcester serve our sponsors.

Frank Blanchard,  
Chapter Treasurer

Diran Apelian, Alcoa-Howmet Professor of Mechanical Engineering at Worcester Polytechnic Institute (WPI), has been named a fellow of the National Academy of Inventors (NAI), the organization announced today. Apelian, founding director of WPI's Metal Processing Institute (MPI), is an internationally recognized pioneer in metals research.

Election to NAI Fellow status is the highest professional accolade bestowed solely to academic inventors who have demonstrated a prolific spirit of innovation in creating or facilitating outstanding inventions that have made a tangible impact on quality of life, economic development, and welfare of society. [To read more...](#)



WPI Professor Diran Apelian Named a Fellow of the National Academy of Inventors

Congratulations to Professor Diana Lados for being elected a Fellow of the ASM International – the world's largest association of materials-centric engineers and scientists. Established in 1969, the Fellow of the Society honor represents highest recognition of distinguished contributions in the field of Materials Science and Engineering, and develops a broadly based forum of technical and professional leaders to serve as advisors to the Society. Professor Lados' citation reads: "For developing and implementing a new integrative design paradigm in Materials Science and Engineering research, education, and application through unique collaborations between university, industry, and government."

[To read more...](#)



Professor Diana Lados from WPI receives the ASM Fellow award from present of ASM International, William Frazier. (<http://www.thefabricator.com/news/metalsmaterials/asm-intl-elects-wpi-professor-as-asm-fellow>)

Worcester Polytechnic Institute (WPI) has launched a new center that aims to dramatically improve data gathering and computer modeling techniques that will lead to the development of better equipment and materials used by the automotive and aerospace industries.

Known as the Center for Materials Processing Data (CMPD), its members generate and manage time- and temperature-dependent material property data—formally called “transient data”— used in process modeling and simulation. Precise data is critical in the ongoing development of high performance materials, but there are no such information repositories widely shared by industry.

CMPD is the fourth center under WPI's Metal Processing Institute, the largest university-industry alliance in North America.

“There is no center like this anywhere in the world,” said Danielle Cote, director of CMPD and an assistant research professor in materials science at WPI. “To our knowledge, no other center is capturing transient data, which is crucial in improving accuracy in many materials process models.”

[Read more...](#)



Danielle Cote, director of CMPD.

Students from WPI, CHTE attended and presented at the 29th Heat Treating Society Conference & Exposition 2017. Farzaneh Farhadi won Third Place in the Poster Competition. These are the presentations they gave at the conference:

- Developing Aluminized coatings on stainless steels by hot dipping
- Cyclic oxidation behavior of uncoated and aluminized stainless steels
- A new test method to characterize heat transfer coefficient distribution in industrial gas quenching systems
- Life Extension of High Temperature Structural Alloys RA602CA in Gas Carburizing Atmosphere
- Identification of the important process parameters to control distortion and residual stress during heat treating
- The Tempering Behavior of Carburized Steel
- The Effects of Heating Rates on the Tempering of 4140 Steel
- Modeling the Carbon Concentration and Microhardness Profiles in Carburized and Carbonitrided Steel

Another group of students attended at presented at MS&T 2017 in Pittsburgh, Pennsylvania, USA. Read more about their presentations [here](#).



WPI attendees at the 29th Heat Treating Society Conference & Exposition 2017

## Chet Inman Award and MQP Awards for WPI

In memory of Chester M. Inman, who helped to found the Worcester Chapter, this scholarship is presented annually by the Central Massachusetts Chapter of ASM International to a regional student in the field of metallurgy or materials science. Please join us in congratulating the tied winners of the 2016 Chet Inman Award, Yuwei Zhai, as shown in the picture below, receiving their award from ASM trustee Dr. David B. Williams.



ASM trustee, and the Chet Inman award winner from WPI

Undergraduate students at Worcester Polytechnic Institute must complete a Major Qualifying Project (MQP), under the guidance of academic advisors, in order to obtain their degrees. Ideally, the project synthesizes all previous study in order to solve problems and perform tasks in the chosen major field, with students striving to communicate results confidently and effectively. The Central Massachusetts Chapter of ASM International participates in the competition to select the best MQP presentation in the Mechanical Engineering department, with special emphasis on Materials research. ASM-CM provides judges who select the three top projects to present their work that evening at the Chapter dinner meeting. The three chosen finalist teams give brief presentations of the highlights of their projects and the ASM-CM members vote to choose the winner of a cash prize.

Congratulations to the 2017 WPI MQP Competition Winners, Daniel Braconnier, Kristin Markuson and Mila Maynard, shown below in the photo. Their winning project: Fabrication and Properties of Novel Polymer-Metal Composites Using 3-D Printing.



Honorably mentioning the other two WPI finalists who got to present at the ASM meeting:

**Theofilos Gatsos:**

Crack Detection Using Wavelets

**Joseph Igoe, Xander Ing, Kevin Lynch, Dylan Martel, Lynn Renner, Tara Sharp, Austin Smith, Steve Thulin:**

Design of a Small Scale Furnace for Fire Resistance Testing of Building Construction Materials

## Optical tweezers for sooner cancer detection

A group of researchers recently published a paper in Nature Scientific Reports, showing that they can build optical tweezers small enough to be inserted into a blood vessel to trap individual cancerous cells, detecting cancer at the earliest stage. The leader of the team, Professor Yuxiang Liu, has 12 years of experience in this field. Optical tweezers use optical beams of laser light to create an attractive force field that can hold and trap small objects. However, conventional optical tweezers focuses the light with large lens, which make the device bulky and susceptible to environmental fluctuations. Liu and his group replaced the lens with two glass optical fibers to project intersecting beams of light, and create a 3D optical trap. In this way, they can make optical tweezers 100 times smaller than the traditional ones, and can create clinical devices about the size of a regular syringe. [Read more...](#)

## Inspired by café lattes

Princeton researcher marveled at the tiered structure in café lattes when espresso is poured into hot milk. They believe that the structure formation in lattes, forming very organized, distinct layers after pouring and mixing of fluids is very surprising, and can be potentially useful in a range of applications.

"From a manufacturing perspective, a single pouring process is much simpler than the traditional sequential stacking of layers in a stratified product," said Stone. "In one application of this study, we are exploring the physics behind making a whole layered structure with one step, rather than one-by-one stacking of the layers."

"The overall analysis showed that the primary mechanism behind the layering is a phenomenon known as double-diffusive convection. It occurs when stacked-up fluids of different densities, impelled by gravity to mix their contents, exchange heat through the movement of their constituent materials. Within a given mixture, denser, cooler liquids sink, while lighter, hotter liquids rise. This sinking and rising stops, however, when the local density in a region within a latte approaches an equilibrium. As a result, the fluid there has to flow horizontally, rather than vertically, creating distinct bands, or layers".

[Read more...](#)

## 3D printing backpack

The company MakeX has announced the first 3D printing backpack. The backpack is about 4 lbs in weight, and has a 100x120x100 mm<sup>3</sup> build space, meaning that you can print small fun objects on the go. Nice Christmas gift idea, isn't it?

[Read more...](#)



## Contact Us

We hope you enjoyed this issue of our newsletter. Please write to us with your thoughts, comments, and article submissions at [asmworc@asm-ma.org](mailto:asmworc@asm-ma.org).