

ME-EM

Michigan Tech

eNewsBrief

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Greetings from William (Bill) Predebon, Chair, Department of Mechanical Engineering-Engineering Mechanics at Michigan Tech. For the latest news and info about our faculty, students and staff, please visit our website at www.mtu.edu/mechanical. Visit us on Facebook, [MEEM](#).

Upcoming Events

Thursday, August 8, 2014

ME Scholarship Boat Cruise

12:30 p.m. - 3:30 p.m. – Afternoon cruise down the Portage Canal on the Ranger III. We will board at the National Park Service dock east of the Dee Stadium, right behind the Franklin Square Inn. We depart at 1:00 p.m. and will return at 3:30 p.m. (plenty of time to attend the Pasty Picnic). Cost of the cruise is \$35 per person which covers the ticket for the Ranger and a \$15 donation to a department scholarship. Food and drinks are compliments of the ME-EM Department. Space is limited and reservations are required so sign up [online](#) or RSVP as soon as possible to kagoulet@mtu.edu or phone (906) 487-2551.



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ME-EM Department Chair Travel

When on travel for the Department, Dr. Predebon visits with alumni to get their feedback on our programs and their career and to give an update on the Department and the University. Please let the Department know if you would be available for a visit when he is in your area. (906) 487-2911.

Dr. Predebon will be traveling to the following cities this coming summer:

June 4 – 5, Detroit, MI

June 5 – 10, Portland, OR for the ASME annual meeting

June 15 – 18, Indianapolis, IN for the ASEE annual meeting

Department Appoints Henes Associate Professorships

Three associate professors have been appointed Endowed Associate Professors. The Henes Associate Professorships have been endowed by Richard (BSME '48) and Elizabeth Henes. Read the article at [Professorships](#).



Gregory Odegard

Richard and Elizabeth Henes Associate Professor in Computational Mechanics



Fernando Ponta

Richard and Elizabeth Henes Associate Professor in Wind Energy



Reza Shahbazian Yassar

Richard and Elizabeth Henes Associate Professor in Nanotechnology

CAPSTONE DESIGN

2014 Senior Capstone Design Highlights...

By the time you're reading this, 17 teams will have just completed presenting their results on projects started in September 2013. Among these projects were an assembly system for an advanced cutting tool, a limited edition tailgate for Dodge RAM trucks, an automated sealant application system, and a roadside repair module for Chrysler applications.

We have nine projects at their halfway point, having just begun this past January. And, stay tuned— you just may see a nationally televised documentary this summer covering another of our projects!

Come and experience Senior Capstone Design at Tech, and find out why the Air Force chose us as one of fifteen elite national programs. You can become involved in our next group of projects beginning September 2nd!

For more information contact: Bob De Jonge
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Cell: 616.780.9379



Student Competitions and Team Awards



Michigan Tech's Department of Mechanical Engineering - Engineering Mechanics and

Keweenaw Research Center again co-hosted the SAE Clean Snowmobile Challenge held March 2nd through the 8th. Thirteen universities participated in the internal combustion category and 8 in the zero emissions category. Top performer in the internal combustion category was Kettering and McGill University won in the zero emission category. Michigan Tech placed 10th overall and received the Bill Paddleford Founder's Award for Most Sportsmanlike Conduct. Read the article at [snowmobile](#).

Student Accomplishments/Awards

David Deisenroth (MS student, ME-EM) has received an NSF East Asia and Pacific Summer Institute (EAPSI) fellowship to travel to Korea this summer to conduct research. EAPSI awards provide U.S. graduate students in science and engineering first-hand research experiences in partner locations, i.e., Australia, China, Japan, Korea, New Zealand, Singapore, or Taiwan; an introduction to the science, science policy, and scientific infrastructure of the respective location; and an orientation to the society, culture, and language of these locations. These goals are met through research visits that will help graduate students initiate scientific relationships to enable future collaboration with foreign counterparts. His advisor is **Dr. Jeffrey Allen**, associate professor, ME-EM.

ME-EM graduate students **Mohammad Reza Amini**, **Wei Luo**, **Anqi Zhang** (PhD program) and **Debmalya Ganguly** (MS program) have been awarded presenting travel grants by the Graduate Student Government. Their advisors are **Dr. Mahdi Shahbakhti**, assistant professor, ME-EM; **Dr. Bo Chen**, associate professor, ME-EM; **Dr. Seong-Young Lee**, associate professor, ME-EM; and **Dr. Craig Friedrich**, professor, ME-EM respectively.



Two ME-EM students are among the three Michigan Tech recipients of a prestigious NSF Graduate Research Fellowship Program for 2014. The ME-EM recipients are MS student **David Deisenroth** and senior **Gregory Hardy**. These are extremely competitive awards that recognize and support outstanding graduate students in NSF-supported science, technology,

Student Accomplishments/ Awards continued

engineering, and mathematics disciplines who are pursuing research-based master's and doctoral degrees at accredited US institutions.

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Two ME-EM graduate students were honored at the Graduate Research Colloquium held February 19-20, 2014.

**Ranjeeth Naik** received the Exceptional Graduate Student Scholar Award. His advisor is **Dr. Amitabh Narain**, profes-

sor, ME-EM.

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Seyedmehdi Mortazavi Zanjani received the 2nd Place Oral Presentation award. His advisor is **Dr. Kazuya Tajiri**, assistant professor, ME-EM.

Read more at [Colloquium](#)

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**Seyedmehdi Mortazavi Zanjani** (PhD candidate, ME-EM) had his paper "Liquid Water Breakthrough Pressure Through Gas Diffusion Layer of Proton Exchange Membrane Fuel Cell," accepted for publi-

cation in the International Journal of Hydrogen Energy. His advisor is **Dr. Kazuya Tajiri**, assistant professor, ME-EM.

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WXYZ Channel 7 news in Detroit aired a feature story about Michigan Tech student members of the campus chapter of the National Society of Black Engineers, who are spending their spring break working to motivate middle and high school students in Detroit schools to see college in their futures and to study science, technology, engineering and math (STEM).

Current Contracts and Grants

Jason Blough (PI, ME-EM), "Support of RMCP Phase II SBIR"; sponsor: Quantum Engineering Design, Inc; total award amount: \$31,000

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**Bo Chen (PI, ME-EM), Jeffrey Naber (co-PI, ME-EM)**; "Nostrum Continued Engine Research"; sponsor: Nostrum Energy, LLC; total award amount: \$25,571.

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Jaclyn Johnson (PI, ME-EM), Jeffrey Naber, and Seong-Young Lee (co-PIs, ME-EM); "Ford Diesel Spray Studies: Rate of Injection Measurements Phase 2"; sponsor: Ford Motor Company; total award amount: \$10,379.

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**Kevin Johnson (PI, ME-EM) and Robert De Jonge (co-PI, ME-EM)**; "Rear Differential Case Testing"; sponsor: American Axle & Manufacturing; total award amount: \$8,541.

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Seong-Young Lee (PI, ME-EM) and Jaclyn Johnson (co-PI, ME-EM); "NSF/DOE Partnership on Advanced Combustion Engines: Ignition and Combustion Characteristics of Transportation Fuels under Lean-Burn Conditions for Advanced Engine Concepts"; sponsor: National Science Foundations; total award amount: \$348,189.

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**Seong-Young Lee (PI, ME-EM), Jaclyn Johnson, and Jeffrey Naber (co-PIs, ME-EM)**; "MTU - Nostrum (Phase IV): Experimental Investigation of Impinging Jet Injector at Engine Relevant Conditions in a Combustion Vessel"; sponsor: Nostrum Energy, LLC; total award amount: \$14,000.

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Seong-Young Lee (PI, ME-EM) and Jeffrey Naber (co-PI, ME-EM); "MTU Combustion Vessel Test - Phase I: Effect of Low Turbulent Velocity on Spark Channel Flame Kernel Formation Processes in Propane-EGR Mixtures"; sponsor: GM Advanced Powertrain; total award amount: \$48,000.

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**Jeffrey Naber (PI, ME-EM) and Bo Chen (co-PI, ME-EM)**; "Combustion Control for SI Engines"; sponsor: Ford Motor Company; total award amount: \$113,827.

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Jeffrey Naber (PI, ME-EM), Seong-Young Lee, and Jaclyn Johnson (co-PIs, ME-EM); "IP8 Ignition and Liquid Length Studies"; sponsor: Mississippi State University; total award amount: \$98,353.

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**Jeffrey Naber (PI, ME-EM), Seong-Young Lee, and Mahdi Shahbakhti (co-PIs, ME-EM)**; "Ignition Studies"; sponsor: Ford Motor Company; total award amount: \$95,752.

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Jeffrey Naber (PI, ME-EM) and Jeremy Worm (co-PI, ME-EM); "Engine Development and Instrumentation for the Nostrum Cycle on a Cummins ISB Diesel Engine"; sponsor: Nostrum Energy, LLC; total award amount: \$202,694.

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**Gregory Odegard (PI, ME-EM)**, "I/UCRC: Novel High Voltage/Temperature Materials Structures"; sponsor: National Science Foundation; total award amount: \$637,495.

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Jeremy Worm (PI, ME-EM) and Jeffrey Naber (co-PI, ME-EM); "Collaborative Testing; sponsor: NorthCentral Technical College"; total award amount: \$7,719.

Faculty and Student Invention Disclosures

Nina Mahmoudian (assistant professor, ME-EM), **Anthony Pinar** (MS student, EEE), and **Brian Page** (sr., ME-EM) have filed an invention disclosure, "Glider for Underwater Problem-solving and Promotion of Interest in Engineering (GUPPIE) version 1 and 2".

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**Nina Mahmoudian** (assistant professor, ME-EM), **Anthony Pinar** (MS student, EEE), and **Eric Wilkening** (sr. ME-EM) have filed an invention disclosure, "Research oriented underwater glider for hands-on investigative engineering (ROUGHIE)".

## Alumni Accomplishments & Awards

**Dr. Kari Jordan** (MSME '08) has been named a lecturer at The Ohio State Engineering Education Innovation Center and Program Manager for The Ohio LSAMP Alliance. The purpose of The Ohio LSAMP Alliance is to significantly increase underrepresented minority student recruitment, retention, persistence, and attainment of science, technology, engineering, and mathematics (STEM) degrees.



**Martin Lagina** (BSME '77) was featured in a History Channel mini-series "The Curse of Oak Island" which Marty owns with his brother Rick. Read the article at [island](#). This documentary (which aired 1/12/14 on the History

Channel) details the history of the mysterious mine. Visit the History Channel site at [History](#) to read more.



**Jillian J. Rothe** (BSME, BSBA '06) was selected by the Alumni Association as Michigan Tech Outstanding Young Alumni for 2014. Jillian is employed by Caterpillar Financial Insurance Services, Asia Pacific Region, as a regional power systems marketing support representative. She will receive her award in August during the Michigan Tech Reunion.



**Martha Sullivan** (BSME '80) was the banquet keynote speaker for the 2014 Society of Women Engineers (SWE) Region H Conference held in February

at Michigan Tech. More than 700 women from Illinois, Indiana, Iowa, Michigan, Minnesota, North Dakota, South Dakota, Wisconsin, and Michigan attended the conference. Michigan Tech's SWE chapter won the bid to host the conference, titled "Extracting the Elements" and including keynote speakers, sessions on professional development and a Career Fair.

## Bereavements

**Warren W. Johnson** (BSME '43) passed away on Saturday, December 21, 2013 in Washington, PA. In 1950 he joined Columbia Gas Systems and retired in 1980 after 27 years. He is survived by his wife Carolyn, 3 children, 3 grandchildren, and 2 great-grandchildren.

## New Staff



**Kevin Johnson** has joined the Department as a research engineer/scientist I. He comes to Michigan Tech from Oldenburg Group Inc. in Iron River, MI where he was a product engineer. Steve has a BS degree in mechanical engineering from Michigan Tech.



**Steven Lehmann** has joined the Department as a research associate. He comes to Michigan Tech from Engineered Machined Products in Escanaba, MI where he was a senior instrumentation engineer. Steve has a BS degree in electrical engineering from Michigan Tech.



**Amy Raffaelli** has joined the Department as an office and account assistant. She comes to the Department from Michigan Tech's Financial Aid Department where she was an office assistant. Amy has an AAS degree in business from Northern Michigan University.



## Promotions and Changes in Positions

**Dr. Jaclyn Johnson** (MSME '06 and PHD '11) was named a research engineer and instructor in the Department of Mechanical Engineering - Engineering Mechanics at Michigan Tech last December. Jaclyn earned her BA degree in physics with a minor in mathematics from Illinois Wesleyan University and her MS in mechanical engineering and PhD in mechanical engineering - engineering mechanics both from Michigan Tech. She was a research engineer in the Department prior to that.



## Retirements

**Joanne Stimac** (office assistant, ME-EM) retired on February 14th. Joanne worked with the graduate program in ME-EM for over ten years.



## Department Accomplishments

US News & World Report's annual graduate school rankings for doctoral granting programs, released on March 11, 2014, ranked Michigan Tech's ME-EM graduate program at 61st in the nation. Michigan Tech's doctoral granting engineering programs earned an overall ranking of 90th. Six of the Michigan Tech engineering doctoral granting programs were ranked in the top 75. Read the article at [rankings](#).

## Faculty/Staff Awards/Accomplishments

Three Department of Mechanical Engineering - Engineering faculty members have been nominated for the Michigan Tech Distinguished Teaching Award. They are associate professors **Dr. Jeffrey Allen** and **Dr. Jason Blough** in the associate professor/professor category and **Dr. Scott Miers** in the assistant professor/lecturer/professor of practice category.



**Nancy Barr** (Communications and Senior Design Capstone Design Programs Advisor, MEEM) has developed a series of modules for MEEM GTA's to help develop their technical communications skills. The modules, adapted

## Faculty/Staff Awards/ Accomplishments continued

from Writing Across the Curriculum, are training sessions that teach evaluators how to provide effective feedback on writing which is the key to improving student communication. Read the article at [writing](#). An article written by Nancy about the course appeared in the March edition of PE magazine, a magazine for professional engineers published by the National Society of Professional Engineers.



**Dr. Mahesh Gupta's** (professor, ME-EM) company Plastic Flow has partnered with Solidworks. According to Dr. Gupta, "Plastic Flow's polyXtrue software supports Solidwork's 3D design software with new capabilities for simulating the flow of plastics through extrusion dies."



**Jay Meldrum** (director, Keweenaw Research Center and graduate faculty, ME-EM) has been elected to the Board of Directors of SAE International. SAE is a global association of more than 138,000 engineers and related technical experts in the automotive, aerospace and commercial-vehicle industries. Read about it at [SAE](#).



## University News/Awards

Michigan Tech's **Air Force ROTC** detachment has been named Team of the Year in an annual competition to determine the best AFROTC detachment in the nation. Tech's detachment topped 145 AFROTC detachments and more than 1,100 colleges and universities nationwide. Read the article at [ROTC](#).



The Michigan Tech **Career Fair** held on February 20th to recruit interns, co-



**Dr. Gregory Odegard** (associate professor and the Richard and Elizabeth Henes Associate Professor in Computational Mechanics, ME-EM), was the March 24th winner of the Props for Profs program through the Jackson Center for Teaching and Learning. Greg's nominators lauded his willingness to design and teach new courses and his general approach to teaching with "enthusiasm and good humor." His openness to consultation outside of class ("and not just during office hours") was also mentioned. The most striking quote from a nominator speaks for itself: "It's always good when you learn, without getting stressed out and have a good relationship with a professor."



**Dr. Mohammad Rastgaar Aagaah** (assistant professor, ME-EM) has been awarded the NSF CAREER grant. The award is titled "Steerable Powered Ankle-foot Prostheses for Increased Mobility in Amputees". It is a 3 year grant of \$497,393.



**Dr. Reza Shahbazian Yassar** (associate professor, ME-EM) has been selected to receive an Air Force

Summer Faculty Fellowship. The Air Force Summer Faculty Fellowship Program offers hands-on exposure to Air Force research challenges through 8- to 12-week research residencies at participating Air Force research facilities for full-time science, mathematics, and engineering faculty at U.S. colleges and universities.



**Dr. Tolou Shokuhfar's** (assistant professor, ME-EM) research was highlighted in the story "It's the Water: Graphene Balloon Yields Unprecedented Images of Hydrated Protein Molecules," has appeared in [Science Daily](#), [Phys.org](#), [Graphene Times](#), and [ScienceNewline](#).



**Connie Tuohimaa** (research and accounting coordinator, ME-EM) was nominated for the Michigan Tech Staff Council Making a Difference Awards in the Unsung Hero category.



**Jeremy Worm** (research engineer and instructor, ME-EM) was quoted in the article "Can an Engineer Prevent the Unknown?" in Design News. Read the article at [engineer](#).



ops, and full-time employees attracted over 200 companies this year. Read the article at [fair](#).



A delegation from Chang'an University in China visited Michigan Tech in December. The visit was highlighted on the Chang'an University website in January. View the article and pictures at [China](#).

President Barack Obama unveiled plans for the American Lightweight and Modern Metals Innovation Institute, a \$140 million manufacturing institute in Canton Township on Tuesday, Febru-

ary 25th. The institute is scheduled to open this spring. The leads for the institute are EWI and the University of Michigan. Michigan Tech is one of the partners along with Ohio State University, Honda North America, Michigan State University, Wayne State University, Boeing, and Alcoa. Read the article at [institute](#).



Michigan Tech's Archives has been recognized as a Keweenaw National Historical Park Heritage Site. The Archives collection focuses on social, cultural and economic aspects of the Western Upper Peninsula and Michigan Tech.

### University News/Awards continued.

Michigan Tech's **Mind Trekkers** brought the science of basketball to the 2014 NBA All-Star Game in New Orleans February 13-16th. Fans of all ages joined the Mind Trekkers for hands-on activities. Read the article at <http://www.mtu.edu/news/stories/2014/february/michigan-tech-mind-trekkers-share-science-basketball-nba-all-star-2014.html>. They also attended the American Association for the Advancement of Science (AAAS) 2014 Annual Meeting in Chicago February 13 - 17, 2014. The student-led Mind Trekkers conducted activities at their Family Science Days hosting thousands of young students and their families from throughout Chicago. See pictures at [Trekkingers](#).



President **Glenn Mroz** testified before the Michigan State Senate Higher Education Appropriations Subcommittee pm Thursday, February 17, regarding the benefits of the Michigan public universities to the state and the nation and calling on the Senate to support Governor Snyder's proposed 6 percent increase in higher education appropri-

ations. He was quoted in the Grand Rapids Press and [Mlive](#).



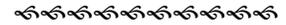
Michigan Tech's **online graduate programs** in business and engineering are ranked in the top 40 of such programs nationwide. Best online rankings released by US News and World Report rated Michigan Tech's online graduate engineering program 35th of 74 programs and Tech's online MBA program placed 36th of 239 programs.



Business Insider has rated Michigan Tech number 11 among the top-20 public universities with the smartest students. Read the article at [smarterst](#).



Accuweather has named Michigan Tech the Nation's Snowiest Campus. The story was carried on the Accuweather site and on Inside Higher Ed. Originally Michigan Tech was left off the list, but due to the "copious responses" they received about the omission, they changed their listing. Read the articles at [weather1](#) and [inside](#).



AccuWeather featured Michigan Tech's Winter Carnival on its website. Read the article and see the pictures at <http://www.accuweather.com/en/weather-news/photos-snowiest-college-in-the/23009367>. Michigan Tech's Winter Carnival also attracted news media attention from NBC who picked up WLUC-TV 6's coverage and aired in Tucson, Ariz.; Albuquerque, N.M.; Amarillo and Beaumont, Tex.; Toronto, Canada, and many other TV markets. The Huffington Post also published a story with many photos of Carnival snow statues. See [Carnival](#).



Ram Trucks' Cold Weather Testing located in Houghton County was highlighted in a YouTube video. Michigan Tech graduate Rod Romain was quoted at the end of the video. Watch it at [video](#).



A long article about Yoopers was featured in the March 27th Huffington Post. A picture taken at the Keweenaw Research Center was featured in the article. Read the article at [Yoopers](#).

### ME-EM Annual Scholarship Winter Carnival Hockey Social February 8, 2014



The 2014 Annual Scholarship Hockey Social netted \$800 for scholarships thanks to the generosity of the alumni and friends who attended the event. The food was good, the camaraderie better. Everyone enjoyed themselves and all left with a gift from the ME-EM Department.