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6-2014

## ME-EM eNewsBrief, June 2014

Department of Mechanical Engineering-Engineering Mechanics, Michigan Technological University

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# ME-EM

Michigan Tech

eNewsBrief

Volume 10 Issue 2 - JUN 2014



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](http://www.mtu.edu/mechanical). Visit us on Facebook, MEEM. Click on the support our future icon to see ways to support the ME-EM Department.

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### 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. Sign up [online](#) on the alumni reunion registration form or RSVP as soon as possible to [kebess@mtu.edu](mailto:kebess@mtu.edu) or phone (906) 487-2551.

#### 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) 487-2551.

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

- July 23—24, Washington DC for the private screening of the documentary The “Wings of Angels”. The invitees to this event include DC policy makers, DC based military representatives, veteran’s organizations, select media, GM executives/internals, Achilles athletes, and Michigan Tech representatives and students.
- August 12—14, Santa Cruz, Bolivia for the ASME-Pan American Academy of Engineering Conference.

## Promotions



**Dr. Jeffrey S. Allen** has been promoted from associate professor with tenure to professor with tenure. His research interests are stability of evaporating and condensing liquid films, capillary-scale gas-liquid flow, near-field optical diagnostics, thermal and mass transport in porous media and fuel cells, low-gravity fluid dynamics, and weak atmospheric shock waves. Visit his website at [Allen](#).



**Dr. Scott A. Miers**, has been promoted from assistant professor without tenure to associate professor with tenure. His research interests are internal combustion engine efficiency, emissions, and performance; alternative and renewable fuels: investigating how the unique chemical compositions affect both engine and vehicle operation; IC engine data acquisition techniques such as piston-mounted wireless microwave telemetry and minimally invasive combustion visualization; alternative and renewable transportation fuels; and in-use emission. Visit his website at [Miers](#).



**Dr. Michele H. Miller** has been promoted from associate professor with tenure to professor with tenure. Her research interests are vibration assisted grinding and water-jet assisted grinding' wheel wear and wheel loading mechanisms, machining of ceramics, machine tool dynamics, optical micro-electromechanical systems (MEMS), and Human factors in design. Visit her website at [Miller](#).



**Dr. Gregory M. Odegard** has been promoted from associate professor with tenure to professor with tenure. His research interests are computational mechanics, computational materials science, and computational chemistry. Visit his website at [Odegard](#).

## Alumni and Friends News, Accomplishments & Awards

Lawrence Livermore National Laboratory highlighted **John Hallquist (MSME and PhD '72)** in an article regarding his entrepreneurial energy and success. Read the article at: [Livermore](#).



The MEEM lobby has a new look thanks to Titan Tire International. Titan chairman, president and CEO **Morry Taylor (BSME 1969)** was instrumental in arranging the donation. The lobby will feature and display education and on-going cutting-edge research within ME-EM on its large 5 section digital media display screens. It will also provide a "home" for our students. Generally our students are always in transit either coming or going from our building for clas-



ses, labs, or project work. We wanted to create some space that they can use to identify themselves as ME-EM citizens. The displays will have slow-rolling headline-type graphics and text as default, but will be touch-selectable to provide more in-depth information and tours. They will deliver content to the accidental customer who happens to walk past or is waiting for the elevator and also make it possible for faculty to meet collaborators and lead them through longer, intentional guided tours via the displays.



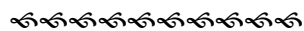
**Michael Molenda (BSME '76)** has been appointed to the Law Related Education Committee of the Florida Bar Association.



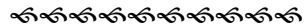
**Jillian J. Rothe (BSME, BSBA '06)** has been named the 2014 Michigan Tech Outstanding Young Alumni. She will receive her award at the Alumni Reunion dinner on August 8th. Read her profile at [Rothe](#).

## Faculty/Staff Awards/Accomplishments

**Nancy Barr (senior design and technical communications advisor, ME-EM)** was named an Outstanding Link Coordinator by the Recognition Committee of the Order of the Engineer. She was one of four link coordinators in the nation to receive this honor. Link coordinators are instrumental in organizing their units' Ring Ceremony, inducting graduates into the Order of the Engineer.



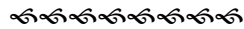
**Dr. John Johnson (research professor and professor emeriti, ME-EM)** has been selected by the National Research Council (under the National Academies) to chair the Committee on the Review of the 21st Century Truck Partnership, Phase 3. Read the article at [Truck](#).



**Dr. Nina Mahmoudian (assistant professor, ME-EM)** had her research with underwater drones highlighted in Michigan Tech News. Read the article [ROUGHIE](#). Her research was also highlighted in the May 31st issue of the Daily Mining Gazette.

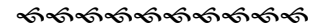


**Dr. Scott Miers (associate professor, ME-EM)** has received the University's 2014 Distinguished Teaching Award in the assistant professor/lecturer category. He also received the Department Teacher of the Year award which is awarded by a vote of the students only. This is the second time he has received the Department award.

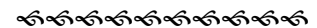


**Dr. Gregory M. Odegard (professor, ME-EM)** has been named Associate Chair and Director of Undergraduate Studies in ME-EM effective July 14, 2014. He replaces **Dr. Michele H. Miller (professor, ME-EM)** who will be on sabbatical leave during the 2014-15 academic year and has decided to return to teaching and research. Dr. Odegard is the Richard and Elizabeth Henes Professor in Computational Mechanics and is recognized and respected as an excellent teacher and researcher. His honors and awards include Associate Fellow of the American Institute of Aeronautics and Astronautics (AIAA), the 2011 Society of Automotive Engineers Ralph R. Teetor Educational Award, the 2008 American Society for Engineering Education Ferdinand P. Beer and E. Russell Johnston Jr. Outstanding New Mechanics Educator Award, the 2008 Michigan Tech Outstanding Graduate Student Mentor

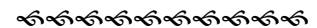
Award, and the 2005 NASA HJE Reid Award. He is a Member of the Editorial Board of the Journal of the Mechanical Behavior of Materials.



**Dr. Gordon Parker's (professor, ME-EM)** Canvas course MEEM4700 was the winner of the CTL's Creative Canvas Course Contest (C4). It was first nominated by students, then selected after review, to be the winner.



CBS Detroit and its Technology Report published news of assistant professor **Mo Rastgaar's (assistant professor, ME-EM)** National Science Foundation (NSF) Career Award for his work on developing a better-working prosthetic foot. Read the article at [CAREER](#).



**Dr. Carl Vilmann (associate professor, ME-EM)** was recognized by the University for his 35 years of service.

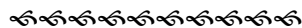


**Dr. Tolou Shokuhfar (assistant professor, ME-EM)** has been notified she will receive the prestigious NSF "CAREER: A new Perspective on Biomineralization in Healthy and Dysfunctional Ferritins" award. It is a 5-year grant, starting on July 1, 2014, and valued at \$400,000.

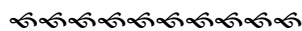
## Department Accomplishments



Michigan Tech's **mobile lab** was highlighted on Wineman Technology Incorporated website. Jeremy Worm research engineer and instructor, ME-EM) is the Director of the Mobile Lab. Read the article at [mobile](#).



The **National Science Foundation** has ranked Michigan Tech's ME-EM Department 22nd among all mechanical engineering departments in the U.S with research expenditures of \$13.981 Million for FY12. This is the highest ranking of any discipline at Michigan Tech.



The latest data/rankings of all mechanical engineering programs by **ASEE** for 2013 have been recently published (this includes all universities with an

ME program in the United States). Michigan Tech's ME-EM department is ranked as follows:

- 14th in BSME degrees (215 awarded (up from 17th) (12.6% women)
- 9th in BSME enrollment at 1,210
- 12th in MSME degrees (88) awarded
- 9th in MSME enrollment (214)
- 42nd in PhD degrees (11) awarded
- 32nd in PhD enrollment (97)
- 22nd in number of tenured/tenure-track faculty (36)

## Faculty and Student Invention Disclosures

**Ezra Bar Ziv** (professor, ME-EM) has filed an invention disclosure, "Modification in mineral content of various biomass wastes for power applications".

**Dr. Steven Goldsmith** (research professor, ME-EM) has filed invention disclosures for "Matlab DC Microgrid Simulation Codes" and "Architecture for a Multiple Vehicle Microgrid".



## Current Contracts and Grants

**Jason Blough** (PI, ME-EM), **Carl Anderson** (Co-PI, ME-EM) and **Mark Johnson** (co-PI, SOT), "Characterization of Torque Converter Cavitation Level During Speed Ratio Operations - Year 3", sponsor: General Motors Corporation, amount: \$84,811.

CB Injector Spray Characterization", sponsor: John Deere, amount: \$73,855.

**Ossama Abdelkhalik** (co-PI, ME-EM), **Wayne Weaver** (PI, ECE), "Advanced Control and Energy Storage Architectures for Microgrids", sponsor: Sandia National Laboratories, amount: \$38,000.

**Jeffrey Naber** (PI, MEEM), **Paul Dice** (co-PI, ME-EM), "Testing on Single Cylinder DI SI Engine for Injector Evaluation and Validation", sponsor: Nostrum energy, LLC, amount: \$8,350.

**Marlene Lappeus**, (PI, ME-EM), **Jeremy Worm** (co-PI, ME-EM), "High Impact STEM Outreach Utilizing the Michigan Tech Mobile Laboratory at the 2014 Michigan Civil Air Patrol Summer Cadet Encampment", sponsor: University of Michigan - Michigan Space Grant Consortium, amount: \$10,001.

**Amitabh Narain** (PI, ME-EM), "Fundamental Investigations for very High Heat-Flux Innovative Operations of Milli-Meter Scale Flow Boilers", sponsor: National Science Foundation, amount: \$299,781.

**Scott Miers** (PI, ME-EM), "Enhancement of Corn-base Fuel for Recreational Engines and Vehicles", sponsor: Minnesota Corn Growers Association, amount: \$192,578.

**Mohammad Rastgaar** (PI, ME-EM), "CAREER: Steerable Powered Ankle-Fott Prostheses for Increased Mobility in Amputees", sponsor: National Science Foundation, amount: \$640,412.

**Jeffrey Naber** (PI, MEEM), **Seong-Young Lee** and **Jaclyn Johnson** (co-PIs, ME-EM), "John Deere Denso GS

**Reza Shahbazian Yassar** (PI, ME-EM), "New Sulfur-Carbon Cathode Material with Improved Electrochemical Performance", sponsor: University of Chicago Argone, LLC, amount: \$18,042.

**Tolou Shokuhfar** (PI, ME-EM), "A Nanoscale Study of Gypsum/Water Interactions: Phase I", sponsor: University of Illinois - Chicago, amount: \$19,999.

**Jeffrey Naber** (PI, ME-EM), "Engine Preparation and Instrumentation for Development and Test of the Nostrum Cycle on Cummins ISB Diesel Engine", sponsor: University of Michigan, amount: \$37,357.

**Jeremy Worm** (PI, ME-EM), "Hands-On Experiential Learning Through Development of an Electric Drive Vehicle", sponsor: National Center for the Advancement of STEM Education (nCASE), amount: \$16,866.

**Jeremy Worm** (PI, ME-EM), "Experiencing Hybrid Electric Vehicle Technologies at the Center for Advanced Automotive Technology 2014 Conference", sponsor: Macomb Community College, amount: \$8,500.

**Jeremy Worm** (PI, ME-EM), "Hands-On Education in Engines & Experimental Systems", sponsor: Deere and Company, amount: \$48,964.

**Jeremy Worm** (PI, ME-EM), "Investigation of Igniter Geometry as an Enabler for Improved Dillution Tolerance and Increased Burn Rates in SI Engines", sponsor: MultiSpark LLC, amount: \$5,094.

# CAPSTONE CORNER

## Co-Op + Intern + Capstone Synergy Improving Co-Op Student Intern Strategy

Have you ever wanted to develop your student intern or co-op program a bit further? Are you looking for strategies that will enhance your results in attracting those Michigan Tech students you would like to bring in as new engineering talent?

More and more of our Capstone Design project supporters have begun to take advantage of combining their student interns and co-ops with Senior Capstone Design teams.

Basic Idea: A student who has spent a period of time at your facility as an intern or co-op returns to Tech for his/her senior year as part of a Capstone team focusing on your project, usually one that the intern had begun work on during the preceding work term at your firm. That former intern has existing knowledge about your organization, the project's needs, and enables the team to excel at delivering results. In addition, you have a year to work with that former intern, as well as the rest of the team to develop potential new engineering talent.

Try it!

For more information contact:

Bob De Jonge  
rdejonge@mtu.edu  
906-487-2142



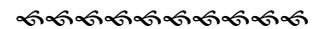
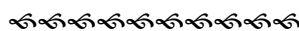
### Student Accomplishments/ Awards

**Jon Furlich (sr., ME-EM)** was the recipient of a Michigan Tech Greek Life Award for Greek Man of the Year.

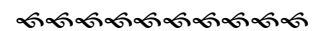


**Mehdi Mortazavi's (PhD candidate, ME-EM)** paper "Liquid Water Break-through Pressure Through Gas Diffusion Layer of Proton Exchange Membrane Fuel Cell," has been accepted for publication in the International Journal of Hydrogen Energy. His advisor is Kazuya Tajiri (assistant professor, ME-EM).

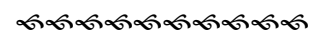
**David Deisenroth (MSME) and Gregory Hardy (BSME)** are recipients of a prestigious National Science Foundation Graduate Research Fellowship Program for 2014. The program recognizes and supports outstanding graduate students in NSF-supported science, technology, engineering, and mathematics disciplines who are pursuing research-based master's and doctoral degrees at accredited US institutions. David is advised by **Dr. Jeff Allen (professor, ME-EM)**. These extremely competitive awards show the excellence of our students at all academic levels.



**Ranjeeth Naik (PhD candidate, ME-EM)** received the Michigan Tech Exceptional Graduate Student Scholarship award at the 20th Annual Student Leadership Awards. His advisor is **Dr. Amitabh Narain (professor, ME-EM)**.

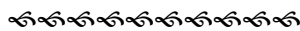


**Bryan Steinhoff (MS candidate, ME-EM)**, has received a Dean's Fellowship. His advisor is **DeSheng Meng (adjunct associate professor, ME-EM)**



## Student Competitions and Team Awards

A documentary about wounded veterans who, through Achilles International, recover some of their spirit and independence with the help of Michigan Tech senior design teams aired on Discovery's American Heroes Channel on May 17, 25, and 31st. The Department has received permission to provide the link and password to the 49 minute documentary. "The Wings of Angels" can be viewed at [Achilles](#) using the password **Magpie2014**.



At the Michigan Tech Design Expo held on April 17, 2014, the following ME-EM teams received awards:

Black & Veatch Building a World of Difference Senior Design Awards

First Place: Teams 144/147, RAM Tailgate Structure & Accessory

- Team Members: Christian Vreeland, Thomas Gruber, Evan Rosemore, Taylor Erva, Kraig Kadletz, Andrew Pospychala, Chad Dickenscheid, and Greg Reed, Mechanical Engineering
- Advisor: Gregory Odegard (professor, ME-EM).
- Sponsor: Chrysler Group LLC

Design Expo Image Contest

First Place: Team 205, Velovations Enterprise

- Team Leaders: Jay Woodbeck and Derek Turner, Mechanical Engineering
- Advisor: Paulus Van Susante (lecturer, ME-EM)
- Sponsors: Specialized Bicycles, Cane Creek Cycling Components, Thomson Bike Products

Invention Disclosure Competition

Best Technical Specification: Martyboard – Portable Assisted Mobility Device

- Team Members: Ashley Kerschen,

Jacob Pederson, and Jacob Liimata, Mechanical Engineering

Best Prior Art Review and Competitive Analysis: Synthetic Drug Detection Platform

- Team Members: Tylor Rathsack, Michael Oates, Jacob Pleshe, Corey Thiel, Mechanical Engineering

See the results and follow the links at [Design](#)



The Michigan Tech SAE Collegiate Branch has been selected as the Class 1 recipient of the 2013 SAE Honeywell Outstanding Collegiate Branch Award. The award recognizes SAE Collegiate Branches for exemplary performance in the areas of technical meetings, networking opportunities, promoting SAE membership, activities including the Collegiate Design Series, and community service programs like A World in Motion. The award was announced on May 6, 2014. Their advisor is **Dr. Jason R. Blough (associate professor, ME-EM)**.

## University News/Awards



Richard Berkey (Industry Projects Manager, Institute for Leadership & Innovation Faculty Advisor, Supermileage Systems Enterprise) has received the 2013 SAE Advisor Award at 2014 SAE Congress.



Michigan Tech's GEAR UP, a Pre-College Innovative Outreach Institute, and the physics department sponsored a workshop on nanotechnology to help spark the interest of pre-college girls on Tuesday, April 15 at Michigan Tech. Nearly 100 female students from Houghton, Hancock and Chassell participated.



The Michigan Tech **MindTrekkers'** presentation at the Independence School in Delaware, "Teaching Sci-

ence with a Show," was published April 27 in Delawareonline. Read the article and watch the video at [Delaware](#). The Sheboyganpress.com also ran an article and video online about the MindTrekkers visit to Lakeland College in Sheboygan WI. See the video at [Sheboygan](#).



Michigan Tech has been named **Michigan's "most underrated university"** by Business Insider, a business, technology and education news website. Only one university was selected from each state. The ranking reflects the university's high academic standards and acceptance rate. They also ranked Michigan Tech number 11 among the top 20 colleges in the nation with the smartest students. See the rankings at [underrated](#) and at [smartest](#).

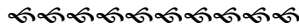
## University News Continued



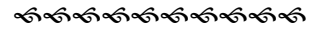
For the ninth year in a row, Michigan Technological University ranks as the number one university nationwide for the number of **Peace Corps Master's International (PCMI)** students currently serving as Peace Corps volunteers. Michigan Tech has 32 graduate students overseas, earning the University top spot on the Peace Corps' annual ranking of PCMI and Paul D. Coverdell Fellows graduate schools. The Department of Mechanical Engineering - Engineering Mechanics was the first mechanical engineering department in the program and continues to be one of only two mechanical engineering departments participating in the program with Oregon State University's mechanical engineering program joining the program.



**Dr. Wayne Pennington** has been named dean of the College of Engineering at Michigan Technological University. He has been a professor of geophysical engineering at Michigan Tech since 1994 and became chair of the Department of Geological and Mining Engineering and Sciences in 2003. He served as chair until May 2013 when he was named interim dean of engineering. Prior to coming to the University, he worked with Marathon Oil and was an assistant professor at University of Texas at Austin.



**Provost Max Seel** was quoted in an article in the FedGazette about increasing numbers of international students in upper Midwest universities. He talked about why Michigan Tech has attracted its large number of international students. Read the article at [provost](#).



More than 150 high school girls from across the nation who are interested in engineering careers came to Michigan Tech the last week of June for an intensive Women in Engineering (WIE) program. Each participant won a \$1,000 scholarship to the competitive program, to cover tuition, room and board, and supplies. Participants spent a week looking at various engineering disciplines—like mechanical, environmental, computer, electrical, chemical, biomedical and civil and others. The young women got a taste of college life by spending the week living in Tech's residence halls, eating in the dining halls, exploring campus and meeting diverse peers. As part of the program each participant selected up to two departments to visit for lab tours. Over 70 girls selected the mechanical engineering lab tour given by **Dr. William Predebon (professor and department chair, ME-EM)**.



The ME-EM "Fishbowl" under construction



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### ME Scholarship Boat Cruise

12:30 p.m. - 3:30 p.m. – Afternoon cruise down the Portage Canal on the Ranger III. Board at the National Park Service dock east of the Dee Stadium, right behind the Franklin Square Inn. Departs at 1:00 p.m. and returns at 3:30 p.m. 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. Sign up [online](#) on the alumni reunion registration form or RSVP as soon as possible to [kebess@mtu.edu](mailto:kebess@mtu.edu) or phone (906) 487-2551.